As filed with the Securities and Exchange Commission on October 22, 2020

Registration No. 333-249404

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

AMENDMENT NO. 1 TO
FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

ATEA PHARMACEUTICALS, INC.
(Exact name of registrant as specified in its charter)

Delaware	**2834**	**46-0574869**
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification No.)

125 Summer Street
Boston, MA 02110
(857) 284-8891
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Jean-Pierre Sommadossi, Ph.D.
President and Chief Executive Officer
Atea Pharmaceuticals, Inc.
125 Summer Street
Boston, MA 02110
(857) 284-8891
(Name, address, including zip code, and telephone number, including area code, of agent for service)

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Davis Polk & Wardwell LLP
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New York, NY 10017
(212) 450-4000

Approximate date of commencement of proposed sale to the public:
As soon as practicable after the effective date of this Registration Statement.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box. ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐ _____

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐ _____

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐ _____

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	**Accelerated filer**	☐
Non-accelerated filer	☒	**Smaller reporting company**	☒
		Emerging growth company	☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the Registration Statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

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The information in this prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Subject to Completion, dated October 22, 2020.

PRELIMINARY PROSPECTUS

Shares

Common Stock

This is Atea Pharmaceuticals, Inc.'s initial public offering. We are offering shares of our common stock. Prior to this offering, there has been no public market for our common stock.

We estimate that the initial public offering price of our common stock will be between $ and $ per share. After pricing of the offering, we expect that the shares will trade on The Nasdaq Global Market under the symbol "AVIR."

We are an "emerging growth company" under the federal securities laws and, as such, are subject to reduced public company disclosure standards. See "Prospectus Summary—Implications of Being an Emerging Growth Company."

Investing in our common stock involves risks that are described in the "Risk Factors" section beginning on page 12 of this prospectus.

	Per Share	Total
Initial public offering price	$	$
Underwriting discounts and commissions paid by us(1)	$	$
Proceeds, before expenses, to us	$	$

(1) We have agreed to reimburse the underwriters for certain FINRA-related expenses. We refer you to "Underwriting" beginning on page 187 for additional information regarding underwriting compensation.

We have granted the underwriters an option for a period of 30 days to purchase up to additional common shares at the public offering price less underwriting discounts and commissions. If the underwriters exercise the option in full, the total underwriting discounts and commissions payable by us will be $, and the total proceeds to us, before expenses, will be $.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The underwriters expect to deliver the shares to purchasers on or about , 2020 through the book-entry facilities of the Depository Trust Company.

J.P. Morgan **Morgan Stanley** **Evercore ISI** **William Blair**

The date of this prospectus is , 2020.

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Neither we nor the underwriters have authorized anyone to provide any information or to make any representations other than those contained in this prospectus or in any free writing prospectuses prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus is an offer to sell only the shares of common stock offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus or in any applicable free writing prospectus related thereto is current only as of its date, regardless of its time of delivery or any sale of shares of our common stock. Our business, financial condition, results of operations and prospects may have changed since that date.

We have proprietary rights to trademarks, trade names and service marks appearing in this prospectus that are important to our business. Solely for convenience, the trademarks, trade names and service marks may appear in this prospectus without the ® and TM symbols, but any such references are not intended to indicate, in any

way, that we forgo or will not assert, to the fullest extent under applicable law, our rights or the rights of the applicable licensors to these trademarks, trade names and service marks. All trademarks, trade names and service marks appearing in this prospectus are the property of their respective owners. We do not intend our use or display of other parties' trademarks, trade names or service marks to imply, and such use or display should not be construed to imply, a relationship with, or endorsement or sponsorship of us by, these other parties.

For investors outside the United States: Neither we nor the underwriters have done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of common stock and the distribution of this prospectus outside the United States.

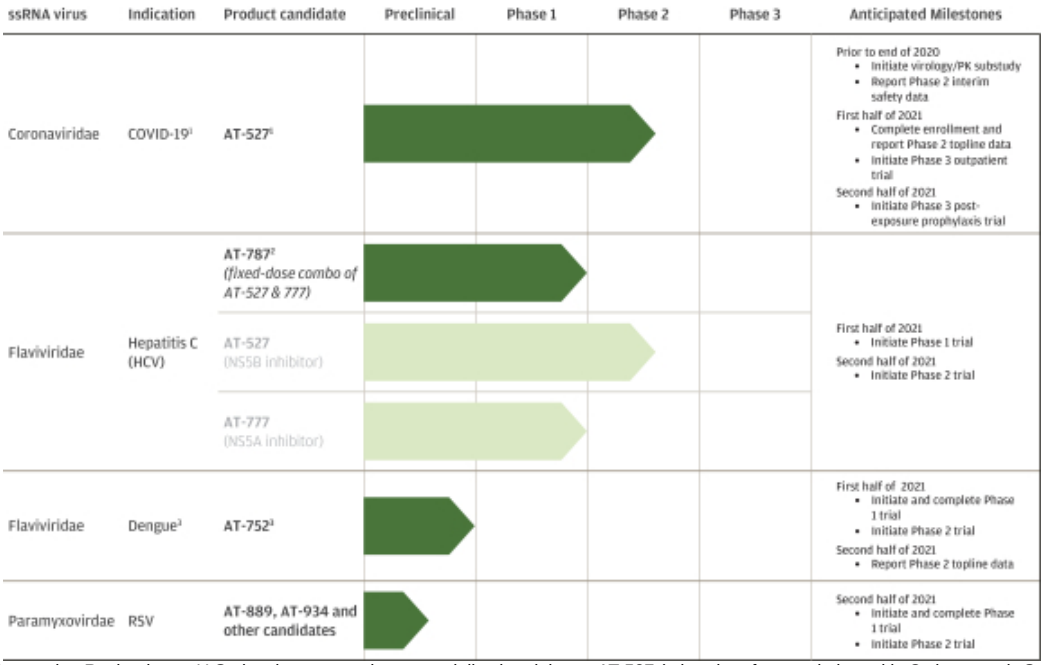
PROSPECTUS SUMMARY

This summary highlights selected information contained elsewhere in this prospectus and is qualified in its entirety by the more detailed information and consolidated financial statements included elsewhere in this prospectus. This summary does not contain all of the information you should consider before investing in our common stock. You should carefully read this entire prospectus, including the information under the sections titled "Risk Factors," "Special Note Regarding Forward-Looking Statements" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and related notes included elsewhere in this prospectus, before making an investment decision. Unless the context requires otherwise, references in this prospectus to "Atea Pharmaceuticals," "Atea," the "Company," "we," "us" and "our" refer to Atea Pharmaceuticals, Inc. and its consolidated subsidiary. As used in this prospectus, unless the context otherwise requires, references to "Roche" refer to F. Hoffman-La Roche Ltd and Genentech, Inc.

Overview

We are a clinical-stage biopharmaceutical company focused on discovering, developing and commercializing antiviral therapeutics to improve the lives of patients suffering from life-threatening viral infections. Leveraging our deep understanding of antiviral drug development, nucleoside biology, and medicinal chemistry, we have built a proprietary purine nucleotide prodrug platform to develop novel product candidates to treat single stranded ribonucleic acid, or ssRNA, viruses, which are a prevalent cause of severe viral diseases. Currently, we are focused on the development of orally available, potent, and selective nucleotide prodrugs for difficult-to-treat, life-threatening viral infections, including severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2, the virus that causes COVID-19, hepatitis C virus, or HCV, dengue virus, and respiratory syncytial virus, or RSV. We believe our team's expertise from decades of developing innovative antiviral treatments uniquely positions us to advance medicines that have the potential to cure some of the world's most severe viral diseases by inhibiting the enzymes central to viral replication.

All of our product candidates have been discovered and developed internally and we retain full global rights to commercialize our product candidates, other than certain ex-U.S. rights licensed to Roche under the license agreement we entered into with Roche in October 2020, or the Roche License Agreement. We retain the right to commercialize all our product candidates in the United States. The following table summarizes our orally administered product candidate pipeline.



1 In October 2020, we licensed to Roche the ex-U.S. development and commercialization rights to AT-527 (other than for certain hepatitis C virus uses). See "Business – Roche License Agreement."

2 AT-787 is our selected product candidate for the treatment of HCV

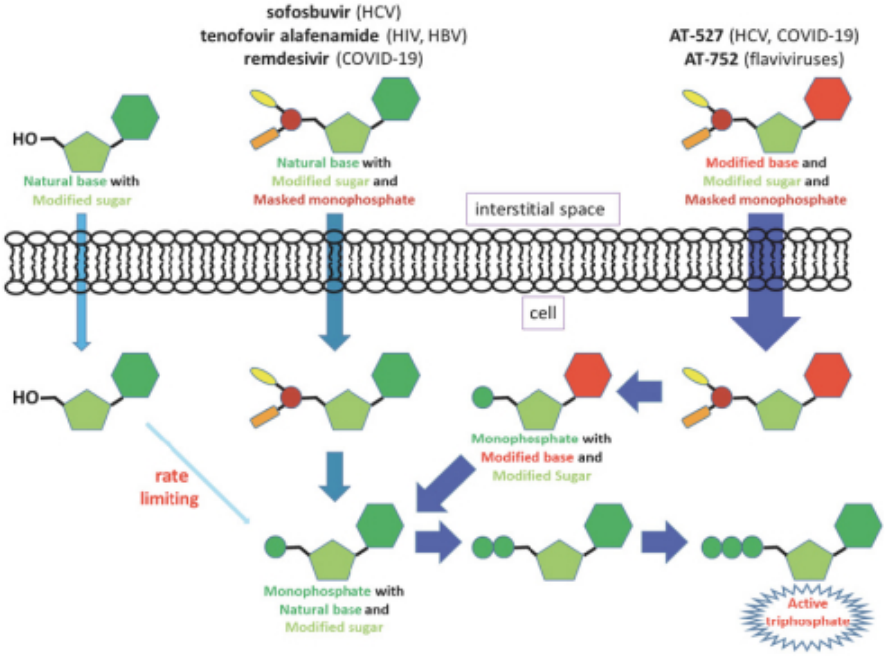
3 In October 2020, as a part of the Roche License Agreement we retained rights to develop and manufacture AT-752 globally and to commercialize AT-752 in the United States for dengue, Japanese Encephalitis, West Nile virus, Yellow Fever and Zika. We agreed with Roche that we would not commercialize AT-752 outside the United States unless we entered into a separate commercialization agreement with Roche to do so.

Our platform

Over the last 40 years, nucleoside and nucleotide, or together, nucleos(t)ide, analogs have been developed to mimic naturally occurring nucleic acids and block viral replication by inhibiting enzymes involved in RNA and DNA viral growth cycles. Nucleos(t)ide analogs have become the backbone of therapies that treat life-threatening viral infections, including human immunodeficiency virus, or HIV, hepatitis B, or HBV, and HCV. Our expertise has allowed us to develop a proprietary platform, which facilitates the development of product candidates that combine unique purine nucleotide scaffolds with a novel double prodrug strategy. We believe that utilizing this double prodrug moiety approach allows us to maximize formation of the active metabolite, potentially resulting in highly potent and selective oral antiviral product candidates.

Our proprietary nucleotide prodrug platform, as illustrated below, is comprised of the following critical components:

- Specific modifications of the purine base, acting as a prodrug, enhance cell membrane permeability, resulting in an intermediate metabolite that maximizes formation of the triphosphate active metabolite in cells;
- Stereospecific phosphoramidate, acting as a prodrug, designed to bypass the first rate-limiting phosphorylation enzyme in the intracellular activation pathway;
- Specific modifications in the sugar moiety of the purine nucleotide scaffold, producing potent antiviral activity with a high degree of selectivity; and
- Highly specific salt form to enhance solubility and drug bioavailability.



We have produced a large library of nucleotide and nucleoside prodrugs specifically designed to target viral RNA dependent RNA polymerase, or RdRp, a key enzyme that is encoded in the viral genome. All ssRNA viruses,

including SARS-CoV-2 and HCV, depend on RdRp for replication and transcription and, since viral RdRp is not present in the host cell, RdRp is an ideal target to inhibit virus replication.

Our product candidates

AT-527 for the treatment of COVID-19

Our lead product candidate, AT-527, is an orally administered, novel antiviral agent for the treatment of patients infected with SARS-CoV-2, which causes COVID-19. AT-527 was specifically designed as a purine nucleotide prodrug to inhibit RdRp. The RdRps in SARS-CoV-2 support the transcription and replication of the approximately 30,000-nucleotide RNA viral genome. The RdRps in SARS-CoV-2 and severe acute respiratory syndrome coronavirus 1, or SARS-CoV, the virus that causes severe acute respiratory syndrome, are the largest and most complex RdRps among RNA viruses. *In vitro* preclinical studies measuring the antiviral activity of AT-527 in several assays against human coronavirus, including SARS-CoV and SARS-CoV-2, suggest that AT-527 is potent and highly selective against these viruses. We are currently evaluating AT-527 in a randomized, double blind, placebo-controlled Phase 2 trial in approximately 190 adult patients with moderate COVID-19 and one or more risk factors for poor outcomes. AT-527 was well tolerated and exhibited highly potent antiviral activity in two clinical trials with HCV infected subjects. We have utilized the pharmacokinetics, safety and tolerability data we obtained from our clinical trials of AT-527 for the treatment of HCV to advance the clinical development of AT-527 for the treatment of COVID-19. HCV was the initial therapeutic indication for which we evaluated AT-527. We dosed our first patient in September 2020 and expect to report topline data from this COVID-19 trial in the first half of 2021. We anticipate initiating a Phase 3 clinical trial to study AT-527 in adult patients with mild to moderate COVID-19 requiring outpatient management in the first half of 2021. In October 2020, we entered into the Roche License Agreement, granting Roche an exclusive license over the development and commercialization rights related to AT-527 outside of the United States (other than for certain hepatitis C virus uses). We also granted Roche a license to manufacture AT-527 worldwide and agreed that Roche would manufacture the global commercial supply of AT-527. As part of the consideration, Roche agreed to pay us an upfront payment of $350 million, or the Roche Upfront Payment. See “Business – Roche License Agreement.”

AT-787 for the treatment of hepatitis C

HCV is a blood-borne, positive sense, ssRNA virus, primarily infecting cells of the liver. HCV is a leading cause of chronic liver disease and liver transplants and spreads via blood transfusion, hemodialysis and needle sticks. We have created a novel combination of AT-527 with AT-777, a nonstructural protein 5A, or NS5A, inhibitor into a single, oral, pan-genotypic fixed dose combination product candidate, AT-787, for the treatment of chronic HCV infection. Despite significant recent advances in treatment, HCV remains a global health burden due to the limitations of currently available treatment options. We believe that AT-787 has the potential to offer a short duration protease-sparing regimen for HCV-infected patients with or without cirrhosis. For patients with decompensated cirrhosis, a life-threatening stage of liver disease, AT-787 has the potential to treat these patients without the co-administration of ribavirin. Upon the resolution of industry wide clinical trial challenges associated with the COVID-19 pandemic, we expect to initiate our Phase 1/2A clinical trial, which is designed to evaluate the safety and pharmacokinetics, or PK, of different dosages of AT-777 in healthy adults and to evaluate the combination of AT-527 and AT-777 in HCV infected subjects.

AT-752 for the treatment of dengue

AT-752 is an oral, purine nucleotide prodrug for the treatment of dengue virus – a mosquito-borne viral infection that infects up to 400 million people a year for which there are currently no therapies approved by

either the U.S. Federal Food and Drug Administration, or the FDA, or European Medicines Agency, or EMA. AT-752 targets the inhibition of the dengue viral polymerase and, in preclinical studies, AT-752 showed potent *in vitro* activity against all serotypes tested as well as potent *in vivo* antiviral activity in a small animal model. We plan to submit an investigational new drug application, or IND, to the FDA or Clinical Trial Application to the to one or more competent authorities outside the United States in the first half of 2021. Contingent upon receipt of FDA or EMA authorization, we expect to initiate a randomized, double-blind, placebo-controlled Phase 1 trial to analyze the safety and PK of several different dosages of AT-752 in healthy adult subjects in the first half of 2021. Following the completion of the Phase 1 trial, we expect to initiate a Phase 2 trial to evaluate the antiviral activity, safety and PK of AT-752 in adult patients with dengue in the first half of 2021. Pursuant to the Roche License Agreement we retained rights to develop and manufacture AT-752 globally and to commercialize AT-752 in the United States for dengue, Japanese Encephalitis, West Nile virus, Yellow Fever and Zika. Rights to AT-752 for other indications were exclusively licensed to Roche. Roche agreed to negotiate in good faith an amendment to the Roche License Agreement pursuant to which Roche may commercialize AT-752 for Dengue outside of the United States, unless Roche offers such commercialization right to us. Neither Roche nor we may commercialize AT-752 outside of the United States for Dengue until we agree to an amendment to the Roche License Agreement. See “Business – Roche License Agreement.”

AT-889, AT-934 and other product candidates for the treatment of respiratory syncytial virus

We are evaluating two lead compounds, AT-889 and AT-934, second generation nucleoside pyrimidine prodrugs and other compounds for the treatment of RSV. RSV is a seasonal respiratory virus that can be serious for infants, older adults, and the immuno-compromised population. AT-889 and AT-934 inhibit RNA polymerase through both initiation of viral replication and viral transcription and showed potent *in vitro* activity in several cell based assays against RSV. We expect to nominate a product candidate and to initiate clinical development of the selected product candidate in the second half of 2021. We believe that the product candidate we develop, if approved, could be the first therapy in over 30 years to be approved specifically for the treatment of RSV.

Our team

Our management team has significant experience discovering, developing and commercializing antiviral therapies for life threatening viral infections. Our Founder, Chairman, and Chief Executive Officer, Jean-Pierre Sommadossi, Ph.D., has over 30 years of scientific, operational, strategic, and management experience in the biopharmaceutical industry and holds more than 60 U.S. patents related to the treatment of infectious disease and cancer. Dr. Sommadossi was the principal founder of Idenix Pharmaceuticals, Inc., or Idenix, which was acquired by Merck & Co., Inc. in 2014, and a co-founder of Pharmasset, Inc., or Pharmasset, which was acquired by Gilead Sciences, Inc. in 2012.

We have assembled an experienced management and scientific team with a track record of success in the field of antiviral drug development, many of whom have worked together previously. Our team has significant expertise in nucleos(t)ide chemistry and biology and has applied that expertise towards the discovery and development of innovative antiviral treatments, including Epivir, Sovaldi, Tyzeka, Valtrex, Wellferon, Videx, Reyataz, Sustiva, Mavyret, Xofluza, Relenza and Zerit. Members of our team have held senior positions at AstraZeneca plc, GlaxoSmithKline plc, Chiron, Novartis International AG, Biogen, F. Hoffmann La Roche, Abbvie, Bristol Myers Squibb, Shire, Biohaven Pharma, Pharmasset, Idenix, Valeant Pharmaceuticals International and Alnylam Pharmaceuticals.

We have been supported by a leading syndicate of investors, which include Adage, Aju IB Investment, Ally Bridge Group, Bain Capital Life Sciences, Cormorant Asset Management, Morningside Ventures, Omega Funds,

Perceptive Advisors, PICTET, RA Capital, Redmile Group, RMI Partners, Rock Springs Capital, Sectoral Asset Management, T. Rowe Price and Valence Life Sciences.

Our strategy

Our goal is to become a global leader in the discovery, development, and commercialization of novel antiviral therapies for severe or life threatening viral infections. We intend to achieve this goal by pursuing the following strategies:

- rapidly complete development and obtain approval for our lead product candidate, AT-527, an oral drug for the treatment of COVID-19;
- deploy our medicinal chemistry expertise and proprietary purine nucleotide platform against severe ssRNA viruses with high unmet need;
- focus on excellent clinical and regulatory execution;
- maximize the value of our product candidates; and
- maintain our entrepreneurial outlook, scientifically rigorous approach, and culture of tireless commitment to patients.

Recent Developments

In October 2020, we issued and sold 8,973,261 shares of our Series D-1 convertible preferred stock to certain existing investors at a price of $11.98 per share for an aggregate purchase price of $107.5 million. We refer to this issuance in this prospectus as the “Series D-1 Closing.” See “Management’s Discussion and Analysis of Financial Condition and Results of Operation—Liquidity and Capital Resources—Sources of Liquidity” for more information.

Risk Factors

Our business is subject to a number of risks of which you should be aware before making an investment decision. These risks are discussed more fully in the “Risk Factors” section of this prospectus immediately following this prospectus summary. These risks include the following:

- there is significant uncertainty around our development of AT-527 as a potential treatment for COVID-19;
- COVID-19 may materially and adversely affect our business, financial results and clinical trials;
- we have a limited operating history and no history of successfully developing or commercializing any approved antiviral products, which may make it difficult to evaluate the success of our business to date and to assess the prospects for our future viability;
- we have incurred significant losses since inception and expect to incur significant additional losses for the foreseeable future. We have no products that have generated any commercial revenue and we may never achieve or maintain profitability;
- even if we consummate this offering, we will require substantial additional financing, which may not be available on acceptable terms, or at all. A failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or commercialization efforts;
- our business is highly dependent on the success of our most advanced product candidates, particularly AT-527, each of which will require significant additional clinical testing before we can seek regulatory approval and

potentially launch commercial sales. If these product candidates do not receive regulatory approval or are not successfully commercialized, or are significantly delayed in doing so, our business will be harmed;

- developments by competitors may render our products or technologies obsolete or non-competitive or may reduce the size of our markets;
- we will need to expand our organization, and we may experience difficulties in managing this growth, which could disrupt our operations;
- an active trading market for our common stock may not develop; and
- the market price of our common stock may be volatile and fluctuate substantially, which could result in substantial losses for purchasers of our common stock in this offering.

Implications of Being an Emerging Growth Company

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, as amended, or the JOBS Act. As such, we may take advantage of certain exemptions from various reporting requirements that are otherwise applicable to public companies. These exemptions include, but are not limited to:

- the option to present only two years of audited financial statements and only two years of related "Management's Discussion and Analysis of Financial Condition and Results of Operations" in this prospectus;
- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended;
- not being required to submit certain executive compensation matters to stockholder advisory votes, such as "say-on-pay," "say-on-frequency," and "say-on-golden parachutes;" and
- not being required to disclose certain executive compensation-related items such as the correlation between executive compensation and performance and comparisons of the chief executive officer's compensation to median employee compensation.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards.

We may take advantage of these provisions until the last day of our fiscal year following the fifth anniversary of the completion of this offering. However, if prior to the end of such five-year period, (i) our annual gross revenue exceeds $1.07 billion, (ii) we issue more than $1.0 billion of non-convertible debt in any three-year period or (iii) we become a "large accelerated filer" (as defined in Rule 12b-2 under the Securities Exchange Act of 1934, as amended, or the Exchange Act), we will cease to be an emerging growth company prior to the end of such five-year period. We will be deemed to be a "large accelerated filer" at such time that we (a) have an aggregate worldwide market value of common equity securities held by non-affiliates of $700.0 million or more as of the last business day of our most recently completed second fiscal quarter, (b) have been required to file annual and quarterly reports under the Exchange Act for a period of at least 12 months, (c) have filed at least one annual report pursuant to the Exchange Act, and (d) are not eligible to use the requirements for "smaller reporting companies" (as defined in Rule 12b-2 of the Exchange Act) under the revenue test for smaller reporting companies. Even after we no longer qualify as an emerging growth company, we may still qualify as a smaller reporting company, which would allow us to take advantage of many of the same exemptions from

disclosure requirements, including reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements.

We have elected to take advantage of certain of the reduced disclosure obligations in the registration statement of which this prospectus is a part and may elect to take advantage of other reduced reporting requirements in future filings. As a result, the information that we provide to our stockholders may be different than you might receive from other public reporting companies in which you hold equity interests.

Corporate Information

We were incorporated under the laws of the state of Delaware in July 2012. Our principal executive offices are located at 125 Summer Street, Boston, Massachusetts 02110 and our telephone number is (857) 284-8891. Our website address is *www.ateapharma.com*. The information contained in, or accessible through, our website does not constitute a part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference.

The Offering

Common stock offered by us	shares.
Common stock to be outstanding after this offering	shares (or shares if the underwriters exercise their option to purchase additional shares in full).
Option to purchase additional shares	The underwriters have a 30-day option to purchase up to additional shares of our common stock at the initial public offering price less estimated underwriting discounts and commissions.
Use of proceeds	We estimate that the net proceeds from this offering will be approximately $ million (or approximately $ million if the underwriters exercise in full their option to purchase additional shares of common stock), assuming an initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. We anticipate that we will use the net proceeds from this offering, together with our existing cash and cash equivalents, to advance the clinical development of AT-527 for the treatment of moderate COVID-19, AT-787 for the treatment of chronic HCV, AT-752 for the treatment of dengue and our RSV program, and for working capital and general corporate purposes. See “Use of Proceeds” for additional information.
Risk factors	You should carefully read the “Risk Factors” beginning on page 12 and the other information included in this prospectus for a discussion of factors you should consider carefully before deciding to invest in our common stock.
Proposed Nasdaq Global Market symbol	“AVIR”

The number of shares of our common stock to be outstanding after this offering is based on 10,309,847 shares of our common stock outstanding as of September 30, 2020, which includes 200,000 shares of unvested restricted stock subject to repurchase, and excludes:

- 4,186,747 shares of our common stock issuable upon the exercise of stock options outstanding under our 2013 Stock Incentive Plan, or our Prior Plan, as of June 30, 2020, at a weighted-average exercise price of $1.51 per share;
- 2,815,000 shares of our common stock issuable upon the exercise of stock options outstanding under our Prior Plan, granted between July 1 through September 30, 2020, at a weighted-average exercise price of $6.84 per share;
- additional shares of our common stock reserved for future issuance under our 2020 Incentive Award Plan, or our 2020 Plan, which will become effective in connection with this offering, as well as any automatic

increases in the number of shares of our common stock reserved for future issuance under our 2020 Plan; and

- additional shares of our common stock that will become available for future issuance under our 2020 Employee Stock Purchase Plan, or out 2020 ESPP, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under our 2020 ESPP.

Unless otherwise indicated, this prospectus reflects and assumes the following:

- a -for- stock split of our common stock, which was effective on , 2020;
- the automatic conversion of all outstanding shares of our convertible preferred stock into an aggregate of 57,932,090 shares of our common stock, which will occur in connection with the closing of this offering;
- no exercise by the underwriters of their option to purchase additional shares of our common stock; and
- the filing of our restated certificate of incorporation.

Summary Consolidated Financial Data

The following tables summarize our consolidated financial data as of the dates indicated and for the periods then ended. We have derived the consolidated statements of operations and comprehensive loss data for the years ended December 31, 2019 and 2018 (except for the pro forma net loss per share and the pro forma share information) from our audited consolidated financial statements and related notes included elsewhere in this prospectus. The summary consolidated statements of operations data presented below for the six months ended June 30, 2020 and 2019 and the summary consolidated balance sheet data as of June 30, 2020 have been derived from our unaudited consolidated financial statements included elsewhere in this prospectus and have been prepared on the same basis as the audited consolidated financial information in those statements. In the opinion of management, the unaudited data reflect all adjustments, consisting only of normal recurring adjustments necessary for a fair statement of the financial information in those statements. Our historical results are not necessarily indicative of the results that may be expected in the future, and our results for any interim period are not necessarily indicative of results that may be expected for any full year. You should read the following summary financial data together with our financial statements and the related notes appearing elsewhere in this prospectus and the information in the sections titled “Selected Financial Data” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.”

	Six Months Ended June 30,		Years Ended December 31,	
	2020	2019	2019	2018
	(in thousands, except share and per share data) (unaudited)			
Statement of Operations and Comprehensive Loss Data				
Operating expenses:				
Research and development	$ 10,576	$ 4,270	$ 10,170	$ 6,675
General and administrative	3,472	1,820	4,438	2,802
Total operating expenses	14,048	6,090	14,608	9,477
Loss from operations	(14,048)	(6,090)	(14,608)	(9,477)
Interest income and other, net	67	343	574	413
Net loss and comprehensive loss	$ (13,981)	$ (5,747)	$ (14,034)	$ (9,064)
Net loss per share attributable to common stockholders - basic and diluted(1)	$ (1.39)	$ (0.57)	$ (1.39)	$ (0.90)
Weighted-average common shares outstanding - basic and diluted(1)	10,093,689	10,091,100	10,091,100	10,039,392
Pro forma net loss per share attributable to common stockholders - basic and diluted (unaudited)(2)	$ (0.30)		$ (0.32)	
Pro forma weighted-average common shares outstanding - basic and diluted (unaudited)(2)	47,292,517		43,736,547	

(1) For details on the calculation of our basic and diluted net loss per share attributable to common stockholders see Notes 10 and 11 to our unaudited and audited consolidated financial statements, respectively, included elsewhere in this prospectus.

(2) For details on the calculation of our pro forma basic and diluted net loss per share attributable to common stockholders see Notes 10 and 11 to our unaudited and audited consolidated financial statements, respectively, included elsewhere in this prospectus.

(in thousands)	As of June 30, 2020		
	Actual	Pro Forma(1)	Pro Forma As Adjusted(2)(4)
		(unaudited)	
Balance Sheet Data			
Cash and cash equivalents	$115,792	$573,292	
Working capital(3)	111,392	218,892	
Total assets	119,745	577,245	
Convertible preferred stock	175,745	—	
Total stockholders' (deficit) equity	(63,127)	220,118	

(1) The pro forma balance sheet data gives effect to (i) the Series D-1 closing, (ii) the Roche Upfront Payment and (iii) the automatic conversion of all outstanding shares of our convertible preferred stock into an aggregate of 57,932,090 shares of common stock, which will occur in connection with the closing of this offering and the filing of our restated certificate of incorporation.

(2) Reflects the pro forma adjustments described in footnote (1) above and the issuance and sale of shares of common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. This pro forma as adjusted information is illustrative only and will depend on the actual initial public offering price and other terms of this offering determined at pricing.

(3) We define working capital as current assets less current liabilities.

(4) Each $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease the pro forma as adjusted amount of each of cash and cash equivalents, working capital, total assets and total stockholders' (deficit) equity by $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each increase or decrease of 1.0 million shares in the number of shares offered by us would increase or decrease each of cash and cash equivalents, working capital, total assets and total stockholders' (deficit) equity by approximately $ million, assuming no change in the assumed initial public offering price and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. The pro forma as adjusted information discussed above is illustrative only and will be adjusted based on the actual initial public offering price and other final terms of this offering.

RISK FACTORS

You should carefully consider the risks and uncertainties described below, as well as the other information in this prospectus, including our financial statements and the related notes and "Management's Discussion and Analysis of Results of Operations and Financial Condition," before making an investment in our common stock. Our business, financial condition, results of operations or prospects could be materially and adversely affected if any of these risks occurs, and as a result, the market price of our common stock could decline and you could lose all or part of your investment. This prospectus also contains forward-looking statements that involve risks and uncertainties. See "Special Note Regarding Forward-Looking Statements." Our actual results could differ materially and adversely from those anticipated in these forward-looking statements as a result of certain factors, including those set forth below.

Risks Related to COVID-19

There is significant uncertainty around our development of AT-527 as a potential treatment for COVID-19.

Our development of AT-527 for the treatment of COVID-19 is in its early stages, and we may not be successful in our development of AT-527 as a potential treatment for COVID-19. We are conducting a Phase 2 clinical trial of AT-527 in hospitalized patients with moderate COVID-19 and at least one risk factor for complications related to COVID-19. We have committed and plan to continue to commit significant financial and personnel resources to the development of AT-527 as a potential treatment for COVID-19. For example, we have allocated certain resources that could be used to develop AT-787 for the treatment of chronic hepatitis C, or HCV, to prioritize development of AT-527 for the treatment of COVID-19. If we are unable to successfully develop AT-527 for the treatment of COVID-19, we will have taken resources away from other development programs and will not be able to recuperate the resources dedicated to developing AT-527 as a potential treatment for COVID-19, which could have a material adverse impact on our business. In addition, we anticipate announcing topline data from our Phase 2 trial after the expected closing of this offering. Our Phase 2 trial is subject to the risks related to clinical development discussed in this "Risk Factors" section. If the topline data are not supportive of further development of AT-527 as a treatment for COVID-19 or the market has a negative reaction to the topline data, the demand for our common stock could decrease significantly, and the price of our common stock could decline substantially, which could result in significant losses for our stockholders.

Further, while there is currently an urgent need for a treatment for COVID-19, the longevity and extent of the COVID-19 pandemic is uncertain. If the pandemic were to dissipate, whether due to a significant decrease in new infections, due to the availability of vaccines, or otherwise, the need for a treatment could decrease significantly. If the need for a treatment decreases before or soon after commercialization of AT-527, if approved, or another treatment for COVID-19 is developed before AT-527, our business could be adversely impacted.

We may expend resources in anticipation of clinical trials and potential commercialization of AT-527, which we may not be able to recover if AT-527 is not approved for the treatment of COVID-19 or we are not successful at commercializing AT-527.

We believe that there is an urgent unmet need for effective COVID-19 treatments. Accordingly, if the data from our ongoing and planned clinical trials of AT-527 in COVID-19 patients are positive, we may pursue certain expedited development, review and approval programs offered by the U.S. Food and Drug Administration, or FDA, to sponsors of drugs designed to treat serious diseases and conditions. These programs may offer the potential for a more rapid approval and commercialization process than traditional FDA review pathways. In order to prepare for the possibility that we may be required to develop and rapidly commercialize AT-527, we

may enter into agreements with, and make payments to, contract manufacturing organizations, or CMOs, prior to obtaining any approval to market AT-527 for the treatment of COVID-19. As a result, we may not be able to recover these costs if AT-527 is not approved for the treatment of COVID-19, which could have a material adverse effect on our business.

We currently expect that the market for a treatment for COVID-19 will be large, and we cannot be certain that our CMOs we will be able to meet any commercial demand for AT-527. If we are unable to meet commercial demand, we may not be able to fully capitalize on our development of AT-527, which could have an adverse effect on our business.

Furthermore, we have never commercialized a product and may not be successful in establishing the capabilities required for commercialization. In order to commercialize AT-527, we will need to rapidly establish and build sales and marketing capabilities prior to obtaining approval to market AT-527. If we do not obtain approval for AT-527, we will have expended those resources prematurely, and our business could be adversely affected.

There has also been significant media coverage regarding the pricing of any vaccine or treatment for COVID-19. For example, Gilead Sciences, Inc. has recently come under scrutiny regarding its pricing of remdesivir, after having donated its initial supply of the drug. Pricing for drugs to treat COVID-19 continues to evolve, and we cannot be certain of the factors that will determine the sales price of AT-527, if approved. If we are unable to sell AT-527 at a sufficient price point, our ability to commercialize AT-527, if approved, may be adversely affected.

AT-527 may face significant competition from vaccines and other treatments for COVID-19 that are in development.

Many biotechnology and pharmaceutical companies are developing treatments for COVID-19 or vaccines against severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2, the virus that causes COVID-19, and any treatment we may develop could face significant competition. Many of these companies, which include large pharmaceutical companies, have greater resources for development and established commercialization capabilities. These companies may develop treatments more rapidly or effectively than we do, may develop a treatment that becomes the standard of care, may develop a treatment at a lower cost, or may be more successful at commercializing an approved treatment, all of which could adversely impact our business. As a result, we may not be able to successfully commercialize AT-527 for the treatment of COVID-19, even if approved, or compete with other treatments or vaccines, which could adversely impact our business and operations.

COVID-19 may materially and adversely affect our business and financial results.

In December 2019, SARS-CoV-2 surfaced in China. Since then, COVID-19 has spread globally. In the United States, travel bans and government stay-at-home orders have caused widespread disruption in business operations and economic activity. Governmental authorities around the world have implemented measures to reduce the spread of COVID-19. These measures, including suggested or mandated “shelter-in-place” orders, have adversely affected workforces, customers, consumer sentiment, economies, and financial markets, and, along with decreased consumer spending, have led to an economic downturn in the United States. In response to the public health directives and orders and to help minimize the risk of COVID-19 for our employees, we have taken precautionary measures, including implementing work-from-home policies for all our employees. Many of our third-party collaborators, such as our CMOs, contract research organizations, or CROs, suppliers and others, have taken similar precautionary measures. These measures have disrupted our business and delayed certain of our clinical programs and timelines. For example, our Phase 1/2A clinical trial of AT-787 for the treatment of HCV is currently paused until the clinical trial sites are able to re-open and resume patient enrollment. Certain

countries, including the United States, have begun the process of re-opening. However, any re-opening could take a significant amount of time, require additional resources to implement social-distancing and other preventive measures, or may not be successful.

The impact to our operations due to the COVID-19 pandemic could be severe and could negatively affect our business, financial condition and results of operations. To the extent the COVID-19 pandemic adversely affects our business and financial results, it may also have the effect of heightening many of the other risk factors described in this “Risk Factors” section, such as those relating to our clinical trial timelines, our ability to enroll subjects for clinical trials and obtain materials that are required for the production of our product candidates, and our ability to raise capital.

COVID-19 may materially and adversely affect our clinical trials.

As a result of the COVID-19 pandemic, we may experience additional disruptions that could severely impact our clinical trials, including:

- delays or difficulties in enrolling patients in a clinical trial, including rapidly evolving treatment paradigms, and patients that may not be able to comply with clinical trial protocols if quarantines impede patient movement or interrupt healthcare services;
- delays or difficulties in clinical site initiation, including difficulties in recruiting clinical site investigators, and clinical site staff, or the overwork of existing investigators and staff;
- diversion or prioritization of healthcare resources away from the conduct of clinical trials and towards the COVID-19 pandemic, including the diversion of hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;
- interruptions or delays in preclinical studies due to restricted or limited operations at research and development laboratory facilities;
- interruption of key clinical trial activities, such as clinical trial site monitoring, due to limitations on travel imposed or recommended by federal, state or provincial governments, employers and others;
- the risk that participants enrolled in our non-COVID-19-related clinical trials will contract COVID-19 while the clinical trial is ongoing, which could impact the results of the clinical trial, including by increasing the number of observed adverse events;
- limitations in employee resources that would otherwise be focused on the conduct of our clinical trials, including because of sickness of employees or their families or the desire of employees to avoid contact with large groups of people;
- delays in receiving approval from local regulatory authorities to initiate our planned clinical trials;
- delays in clinical sites receiving the supplies and materials needed to conduct our clinical trials;
- interruption in global shipping that may affect the transport of clinical trial materials, such as investigational drug product;
- changes in local regulations as part of a response to the COVID-19 outbreak that may require us to change the ways in which our clinical trials are conducted, which may result in unexpected costs, or to discontinue the clinical trials altogether;
- delays in necessary interactions with local regulators, ethics committees and other important agencies and contractors due to limitations in employee resources or forced furlough of government employees; and
- the refusal of the FDA to accept data from clinical trials in these affected geographies.

For example, our HCV program has been delayed until the clinical trial sites conducting our Phase 1/2A trial are able to re-open and resume enrollment, and our other development programs may be delayed or otherwise negatively impacted. As a result, the expected timeline for data readouts of our clinical trials and certain regulatory filings will likely be negatively impacted, which would adversely affect and delay our ability to obtain regulatory approvals for our product candidates, increase our operating expenses, and have a material adverse effect on our financial condition. Moreover, SARS-CoV-2 is a novel pathogen, and information regarding the symptoms, progression, and spread of COVID-19 continues to rapidly evolve, which may present additional challenges for the conduct of our clinical trials in COVID-19 patients. For example, COVID-19 patients have presented with a wide range of symptoms and side effects, which may make it more difficult for clinical trial investigators to determine whether any adverse events observed in our clinical trials are related to AT-527 or are consistent with the underlying disease. Any increase in the severity or incidence of adverse events deemed to be related to AT-527 could delay or prevent its regulatory approval, which could have a material adverse effect on our financial condition.

Risks Related to Our Financial Condition and Capital Requirements

We have a limited operating history and no history of successfully developing or commercializing any approved antiviral products, which may make it difficult to evaluate the success of our business to date and to assess the prospects for our future viability.

We are a clinical-stage biopharmaceutical company. Our operations to date have been limited to financing and staffing our company, developing our technology and identifying and developing our product candidates. Our prospects must be considered in light of the uncertainties, risks, expenses and difficulties frequently encountered by biopharmaceutical companies in their early stages of operations. We have not yet demonstrated an ability to complete any late-stage or pivotal clinical trials, obtain marketing approval, manufacture a commercial-scale product, or conduct sales and marketing activities necessary for successful product commercialization, or arrange for third parties to do these activities on our behalf. Consequently, predictions about our future success or viability may not be as accurate as they could be if we had a longer operating history or a history of successfully developing, obtaining marketing approval for and commercializing antiviral therapies.

In addition, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown obstacles. If we successfully develop a product candidate, we will eventually need to transition from a company with a research and development focus to a company capable of supporting commercial activities. We may not be successful in this transition. For example, we may need to rapidly develop our commercialization capabilities if AT-527 is approved for the treatment of COVID-19.

As we continue to build our business, we expect our financial condition and operating results may fluctuate significantly from quarter to quarter and year to year due to a variety of factors, many of which are beyond our control. Accordingly, you should not rely upon the results of any particular quarterly or annual period as indications of future operating performance.

We have incurred significant losses since inception and expect to incur significant additional losses for the foreseeable future. We have no products that have generated any commercial revenue and we may never achieve or maintain profitability.

We have incurred significant operating losses since our inception, including operating losses of $9.5 million, $14.6 million and $14.0 million for the years ended December 31, 2018 and 2019 and the six months ended June 30, 2020, respectively. As of June 30, 2020, we had an accumulated deficit of $68.2 million. In addition, we have not commercialized any products and have never generated any revenue from product sales. We have devoted almost all of our financial resources to research and development, including our clinical trials and preclinical development activities.

We expect to continue to incur significant additional operating losses for the foreseeable future as we seek to advance product candidates through clinical development, continue preclinical development, expand our research and development activities, develop new product candidates, complete preclinical studies and clinical trials, seek regulatory approval and, if we receive regulatory approval, commercialize our products. In order to obtain FDA approval to market any product candidate in the United States, we must submit to the FDA a New Drug Application, or NDA, demonstrating to the FDA's satisfaction that the product candidate is safe and effective for its intended use(s). This demonstration requires significant research and extensive data from animal tests, which are referred to as nonclinical or preclinical studies, as well as human tests, which are referred to as clinical trials. Furthermore, the costs of advancing product candidates into each succeeding clinical phase tend to increase substantially over time. The total costs to advance any of our product candidates to marketing approval in even a single jurisdiction would be substantial and difficult to accurately predict. Because of the numerous risks and uncertainties associated with the development of drug products, we are unable to accurately predict the timing or amount of increased expenses or when, or if, we will be able to begin generating revenue from the commercialization of products or achieve or maintain profitability. Our expenses will also increase substantially if or as we:

- progress our ongoing clinical trial or initiate additional clinical trials of our most advanced product candidate, AT-527, including our ongoing Phase 2 clinical trial for the treatment of patients with moderate COVID-19;
- advance the development of our product candidates, including our Phase 2 clinical trial of AT-527, commencing a Phase 1/2A clinical trial of AT-527 for the treatment of HCV, which has been delayed due to the COVID-19 pandemic, and a Phase 1 clinical trial of AT-752 for the treatment of dengue, and the preclinical development of our other product candidates, including AT-899, AT-934 and other product candidates for the treatment of respiratory syncytial virus, or RSV;
- continue to discover and develop additional product candidates;
- seek regulatory and marketing approvals for product candidates that successfully complete clinical trials, if any;
- establish manufacturing and supply chain capacity sufficient to provide commercial quantities of any product candidates for which we may obtain marketing approval, if any;
- establish a sales, marketing, internal systems and distribution infrastructure to commercialize any products for which we may obtain regulatory approval, if any, in geographies in which we plan to commercialize our products ourselves;
- maintain, expand, protect and enforce our intellectual property portfolio;
- hire additional staff, including clinical, scientific, technical, regulatory, operational, financial, commercial and support personnel, to execute our business plan and support our product development and potential future commercialization efforts;
- more extensively utilize external vendors for support with respect to research, development, manufacturing, commercialization, regulatory, pharmacovigilance and other functions;
- acquire or in-license commercial products, additional product candidates and technologies;
- make royalty, milestone or other payments under any future in-license agreements;
- incur additional legal, accounting and other expenses in operating our business; and
- operate as a public company.

Furthermore, our ability to successfully develop, commercialize and license any products and generate product revenue is subject to substantial additional risks and uncertainties. Each of our product candidates will require additional preclinical and/or clinical development, regulatory approval in not less than one jurisdiction, the securing of manufacturing supply, capacity, distribution channels and expertise, the use of external vendors, the building of a commercial organization, substantial investment and significant marketing efforts before we generate any revenue from product sales. As a result, we expect to continue to incur operating losses and negative cash flows for the foreseeable future. These operating losses and negative cash flows have had, and will continue to have, an adverse effect on our stockholders' equity and working capital.

The amount of future losses and when, if ever, we will achieve profitability are uncertain. We have no products that have generated any commercial revenue, do not expect to generate revenues from the commercial sale of products in the foreseeable future until we have successfully developed one or more product candidates, and might never generate revenues from the sale of products. Our ability to generate product revenue and achieve profitability will depend on, among other things, successful completion of the clinical development of our product candidates; obtaining necessary regulatory approvals from the FDA and foreign regulatory authorities; establishing manufacturing and sales capabilities; market acceptance of our products, if approved, and establishing marketing infrastructure to commercialize our product candidates for which we obtain approval; and raising sufficient funds to finance our activities. We might not succeed at any of these undertakings. If we are unsuccessful at some or all of these undertakings, our business, prospects, and results of operations may be materially adversely affected.

Even if we consummate this offering, we will require substantial additional financing, which may not be available on acceptable terms, or at all. A failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or commercialization efforts.

Our operations have incurred substantial expenses since inception. We expect to continue to incur substantial expenses to continue the clinical development of AT-527 and AT-787, to initiate the clinical development of AT-752, for future clinical trials for our other product candidates and to continue to identify new product candidates.

Even after the consummation of this offering, we will continue to need additional capital beyond the proceeds of this offering to fund future clinical trials and preclinical development, which we may raise through equity offerings, debt financings, marketing and distribution arrangements and other collaborations, strategic alliances and licensing arrangements or other sources. Additional sources of financing might not be available on favorable terms, if at all. If we do not succeed in raising additional funds on acceptable terms, we might be unable to initiate or complete planned clinical trials or seek regulatory approvals of any of our product candidates from the FDA, or any foreign regulatory authorities, and could be forced to discontinue product development. In addition, attempting to secure additional financing may divert the time and attention of our management from day-to-day activities and harm our product candidate development efforts.

As of June 30, 2020, we had cash and cash equivalents of $115.8 million. We estimate that our net proceeds from this offering will be approximately $ million, based on an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. The net proceeds from this offering and our existing cash and cash equivalents will not be sufficient to fund all of our efforts that we plan to undertake.

Based on our current operating plan, we believe that the net proceeds from this offering, together with our existing cash and cash equivalents, will be sufficient to fund our operating expenses and capital expenditure requirements . This estimate is based on assumptions that may prove to be wrong, and we could use our

available capital resources sooner than we currently expect. We will require significant additional funds in order to launch and commercialize our current and any future product candidates to the extent that such launch and commercialization are not the responsibility of a collaborator. In addition, other unanticipated costs may arise in the course of our development efforts. Because the design and outcome of our planned and anticipated clinical trials is highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of any product candidate we develop.

Our future capital requirements depend on many factors, including:

- the scope, progress, results and costs of our preclinical studies and clinical trials;
- the timing of, and the costs involved in, obtaining marketing approvals for our current and future product candidates in regions where we choose to commercialize any products;
- the number of future product candidates and potential additional indications that we may pursue and their development requirements;
- the stability, scale, yield and cost of manufacturing our product candidates for clinical trials, in preparation for regulatory approval and in preparation for commercialization;
- the costs of commercialization activities for any approved product candidate to the extent such costs are not the responsibility of any collaborators, including the costs and timing of establishing product sales, marketing, distribution and manufacturing capabilities;
- revenue, if any, received from commercial sales of our product candidates, should any of our product candidates receive marketing approval;
- the costs and timing of changes in pharmaceutical pricing and reimbursement infrastructure;
- subject to receipt of regulatory approval and revenue, if any, received from commercial sales for any approved indications for any of our product candidates;
- our ability to compete with other therapies in the indications we target;
- the extent to which we in-license or acquire rights to other products, product candidates or technologies;
- our headcount growth and associated costs as we expand our research and development capabilities and establish a commercial infrastructure;
- the costs of preparing, filing and prosecuting patent applications and maintaining and protecting our intellectual property rights, including enforcing and defending intellectual property-related claims; and
- the costs of operating as a public company.

We cannot be certain that additional funding will be available on acceptable terms, or at all. If we are unable to raise additional capital in sufficient amounts, on terms acceptable to us, or on a timely basis, we may have to significantly delay, scale back or discontinue the development or commercialization of our product candidates or other research and development initiatives.

Raising additional capital may cause additional dilution to our stockholders, including purchasers of common stock in this offering, restrict our operations, require us to relinquish rights to our technologies or product candidates, and could cause our share price to fall.

Until such time, if ever, as we can generate substantial revenue from product sales, we may finance our cash needs through a combination of equity offerings, debt financings, marketing and distribution arrangements and

other collaborations, strategic alliances and licensing arrangements. In addition, we may seek additional capital due to favorable market conditions or strategic considerations, even if we believe that we have sufficient funds for our current or future operating plans.

To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our operations, our ability to take specific actions, such as incurring additional debt, making capital expenditures, declaring dividends, redeeming our stock, making certain investments and engaging in certain merger, consolidation or asset sale transactions, among other restrictions. If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may be required to relinquish valuable rights to our technologies, future revenue streams or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

We have not generated any revenue and may never be profitable.

Our ability to become profitable depends upon our ability to generate revenue. To date, we have not generated any revenue and do not expect to generate significant product revenue unless or until we successfully complete clinical development and obtain regulatory approval of, and then successfully commercialize, at least one of our product candidates. Other than AT-527, AT-787 and AT-752, our product candidates are in the preclinical stages of development and will require additional preclinical studies and clinical development as well as regulatory review and approval, substantial investment, access to sufficient commercial manufacturing capacity and significant marketing efforts before we can generate any revenue from product sales. Our ability to generate revenue depends on a number of factors, including, but not limited to:

- timely initiation and completion of our clinical trials of AT-527, AT-787 and AT-752, our preclinical studies and our future clinical trials, which may be significantly slower or more costly than we currently anticipate and will depend substantially upon the performance of third-party contractors;
- our ability to complete additional investigational new drug application-, or IND-, enabling studies and successfully submit INDs or comparable applications to allow us to initiate additional clinical trials of AT-527, AT-787 and AT-752, and initiate clinical trials for any future product candidates;
- whether we are required by the FDA or similar foreign regulatory authorities to conduct additional clinical trials or other studies beyond those planned to support the approval and commercialization of our product candidates or any future product candidates;
- our ability to demonstrate to the satisfaction of the FDA or similar foreign regulatory authorities the safety and efficacy of our product candidates or any future product candidates;
- the prevalence, duration and severity of potential side effects or other safety issues experienced with our product candidates or future product candidates, if any;
- the timely receipt of necessary marketing approvals from the FDA or similar foreign regulatory authorities;
- the willingness of physicians, operators of clinics and patients to utilize or adopt any of our product candidates or future product candidates as potential antiviral therapies;

- our ability and the ability of third parties with whom we contract to manufacture adequate clinical and commercial supplies of our product candidates or any future product candidates, remain in good standing with regulatory authorities and develop, validate and maintain commercially viable manufacturing processes that are compliant with current good manufacturing practices, or cGMP;
- our ability to successfully develop a commercial strategy and thereafter commercialize our product candidates or any future product candidates in the United States and internationally, if licensed for marketing, reimbursement, sale and distribution in such countries and territories, whether alone or in collaboration with others; and
- our ability to establish, maintain, protect and enforce intellectual property rights in and to our product candidates or any future product candidates.

Many of the factors listed above are beyond our control, and could cause us to experience significant delays or prevent us from obtaining regulatory approvals or commercialize our product candidates. Even if we are able to commercialize our product candidates, we may not achieve profitability soon after generating product sales, if ever. If we are unable to generate sufficient revenue through the sale of our product candidates or any future product candidates, we may be unable to continue operations without continued funding.

Our ability to use our net operating loss carryforwards and other tax attributes to offset future taxable income may be subject to certain limitations.

As of December 31, 2019, we had U.S. federal net operating loss carryforwards, or NOLs, of $49.3 million, which may be available to offset future taxable income, if any, of which $27.5 million begin to expire in 2033 and of which $21.8 million do not expire but are limited in their usage (for taxable years beginning after December 31, 2020) to an annual deduction equal to 80% of annual taxable income. In addition, as of December 31, 2019, we had state NOLs of $49.2 million, which may be available to offset future taxable income, if any, and begin to expire in 2033. As of December 31, 2019, we also had federal and state research and development credit carryforwards of $0.35 million and $0.14 million, respectively, which begin to expire in 2033. In general, under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, or the Code, a corporation that undergoes an “ownership change,” generally defined as a greater than 50% change by value in its equity ownership over a three-year period, is subject to limitations on its ability to utilize its pre-change NOLs and its research and development credit carryforwards to offset future taxable income. Our existing NOLs and research and development credit carryforwards may be subject to limitations arising from previous ownership changes, and if we undergo an ownership change in connection with or after this offering, our ability to utilize NOLs and research and development credit carryforwards could be further limited by Sections 382 and 383 of the Code. In addition, future changes in our stock ownership, some of which might be beyond our control, could result in an ownership change under Sections 382 and 383 of the Code. For these reasons, we may not be able to utilize a material portion of the NOLs or research and development credit carryforwards even if we attain profitability.

Risks Related to the Discovery, Development, Preclinical and Clinical Testing, Manufacturing and Regulatory Approval of Our Product Candidates

Our business is highly dependent on the success of our most advanced product candidates, particularly AT-527, each of which will require significant additional clinical testing before we can seek regulatory approval and potentially launch commercial sales. If these product candidates do not receive regulatory approval or are not successfully commercialized, or are significantly delayed in doing so, our business will be harmed.

A substantial portion of our business and future success depends on our ability to develop, obtain regulatory approval for and successfully commercialize our most advanced product candidates, AT-527 for the treatment

of COVID-19, AT-787 for the treatment of HCV, and AT-752 for the treatment of dengue fever. We currently have no products that are approved for commercial sale and have not completed the development of any of our product candidates, and we may never be able to develop marketable products. Other than our development of AT-527 for the treatment of COVID-19, for which we expect to expend resources in the near term, we expect that a substantial portion of our efforts and expenditures over the next few years will be devoted to our most advanced product candidates, which will require additional clinical development, management of clinical, medical affairs and manufacturing activities, obtaining regulatory approvals in multiple jurisdictions, securing of manufacturing supply, building of a commercial organization, substantial investment and significant marketing efforts before we can generate any revenues from any commercial sales from any product candidate, if approved. We cannot be certain that any of these product candidates will be successful in clinical trials, receive regulatory approval or be successfully commercialized even if we receive regulatory approval. Further, our development of any of these product candidates may be delayed, which may affect our ability to successfully commercialize any product. For example, enrollment in our Phase 1/2A trial of AT-787 for the treatment of HCV has been delayed due to the COVID-19 pandemic. Additionally, if our competitors develop any products to treat COVID-19, HCV, RSV, dengue, or any other diseases which our current or future product candidates are designed to treat, before we are able to successfully develop a product candidate, or if our competitors develop any products that are superior to our product candidates, our potential market share could become smaller or non-existent. Even if we receive approval to market these product candidates from the FDA or other regulatory bodies, we cannot be certain that such product candidates will be successfully commercialized, widely accepted in the marketplace or more effective than other commercially available alternatives. Nor can we be certain that, if approved, the safety and efficacy profile of these product candidates will be consistent with the results observed in clinical trials. If we are not successful in the clinical development of our most advance product candidates, the required regulatory approvals for these product candidates are not obtained, there are significant delays in the development or approval of these product candidates, or any approved products are not commercially successful, our business, financial condition and results of operations may be materially harmed.

The regulatory approval processes of the FDA and comparable foreign regulatory authorities are lengthy, expensive, time-consuming, and inherently unpredictable. If we are ultimately unable to obtain regulatory approval for our product candidates, we will be unable to generate product revenue and our business will be seriously harmed.

We are not permitted to commercialize, market, promote or sell any product candidate in the United States without obtaining marketing approval from the FDA. Foreign regulatory authorities impose similar requirements. The time required to obtain approval by the FDA and comparable foreign regulatory authorities is unpredictable, typically takes many years following the commencement of clinical trials and depends upon numerous factors, including the type, complexity and novelty of the product candidates involved. In addition, approval policies, regulations or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions, which may cause delays in the approval or the decision not to approve an application. Regulatory authorities have substantial discretion in the approval process and may refuse to accept any application or may decide that our data are insufficient for approval and require additional preclinical, clinical or other studies. For example there are currently no drugs approved by the FDA for the treatment of COVID-19, and therefore the nature and amount of clinical and other data that may be required for the FDA to approve AT-527 for the treatment of moderate COVID-19 remains unclear. Although we believe that our ongoing and planned Phase 2 trials of AT-527 in moderate COVID 19, if successful, may enable us to submit an NDA seeking accelerated approval of AT-527 for the treatment of moderate COVID-19, we have not yet discussed potential registration pathways with the FDA, and there is no guarantee that the FDA will agree with any strategy we may propose. We have not submitted an NDA for, or obtained regulatory approval of, any product candidate. We must complete additional

preclinical or nonclinical studies and clinical trials to demonstrate the safety and efficacy of our product candidates in humans to the satisfaction of the regulatory authorities before we will be able to obtain these approvals, and it is possible that none of our existing product candidates or any product candidates we may seek to develop in the future will ever obtain regulatory approval. Applications for our product candidates could fail to receive regulatory approval for many reasons, including but not limited to the following:

- the FDA or comparable foreign regulatory authorities may disagree with the design, implementation or interpretation of results of our clinical trials;
- the FDA or comparable foreign regulatory authorities may determine that our product candidates are not safe and effective, only moderately effective or have undesirable or unintended side effects, toxicities or other characteristics that preclude our obtaining marketing approval or prevent or limit commercial use of our products;
- the population studied in the clinical program may not be sufficiently broad or representative to assure efficacy and safety in the full population for which we seek approval;
- we may be unable to demonstrate to the FDA or comparable foreign regulatory authorities that a product candidate's clinical and other benefits outweigh its safety risks;
- the data collected from clinical trials of our product candidates may not be sufficient to support the submission of an NDA or other submission or to obtain regulatory approval in the United States or elsewhere;
- the FDA or comparable foreign regulatory authorities may fail to approve the manufacturing processes, test procedures and specifications, or facilities of third-party manufacturers with which we contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our or our collaborators' clinical data insufficient for approval.

This lengthy approval process, as well as the unpredictability of the results of clinical trials, may result in our failing to obtain regulatory approval to market any of our product candidates, which would seriously harm our business. In addition, even if we or our collaborators were to obtain approval, regulatory authorities may approve any of our product candidates for fewer or more limited indications than we request, may impose significant limitations in the form of narrow indications, warnings, or a Risk Evaluation and Mitigation Strategy, or REMS. Regulatory authorities may not approve the price we or our collaborators intend to charge for products we may develop, may grant approval contingent on the performance of costly post-marketing clinical trials, or may approve a product candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that product candidate. Any of the foregoing scenarios could seriously harm our business.

Clinical development is lengthy and uncertain. We may encounter substantial delays and costs in our clinical trials, or may not be able to conduct or complete our clinical trials on the timelines we expect, if at all.

Before obtaining marketing approval from the FDA or other comparable foreign regulatory authorities for the sale of our product candidates, we must complete preclinical development and extensive clinical trials to demonstrate the safety and efficacy of our product candidates. Clinical testing is expensive, time-consuming and subject to uncertainty. A failure of one or more clinical trials can occur at any stage of the process, and the outcome of preclinical studies and early-stage clinical trials may not be predictive of the success of later clinical trials. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their drugs. To date, we have not

completed any late-stage or pivotal clinical trials for any of our product candidates. We cannot guarantee that any of our ongoing clinical trials will be initiated or conducted as planned or completed on schedule, if at all. We also cannot be sure that submission of any future IND or similar application will result in the FDA or other regulatory authority, as applicable, allowing future clinical trials to begin in a timely manner, if at all. Moreover, even if these trials begin, issues may arise that could cause regulatory authorities to suspend or terminate such clinical trials. A failure of one or more clinical trials can occur at any stage of testing, and our future clinical trials may not be successful. Events that may prevent successful or timely initiation or completion of clinical trials include:

- inability to generate sufficient preclinical, toxicology, or other *in vivo* or *in vitro* data to support the initiation or continuation of clinical trials;
- delays in reaching a consensus with regulatory authorities on study design or implementation of the clinical trials;
- delays or failure in obtaining regulatory authorization to commence a trial;
- delays in reaching agreement on acceptable terms with prospective CROs and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among CROs and clinical trial sites;
- delays in identifying, recruiting and training suitable clinical investigators;
- delays in obtaining required institutional review board, or IRB, approval at each clinical trial site;
- delays in recruiting suitable patients to participate in our clinical trials;
- delays in manufacturing, testing, releasing, validating or importing/exporting sufficient stable quantities of our product candidates for use in clinical trials or the inability to do any of the foregoing;
- insufficient or inadequate supply or quality of product candidates or other materials necessary for use in clinical trials, or delays in sufficiently developing, characterizing or controlling a manufacturing process suitable for clinical trials;
- imposition of a temporary or permanent clinical hold by regulatory authorities for a number of reasons, including after review of an IND or amendment or equivalent foreign application or amendment; as a result of a new safety finding that presents unreasonable risk to clinical trial participants; or a negative finding from an inspection of our clinical trial operations or study sites;
- developments on trials conducted by competitors for related technology that raises FDA or foreign regulatory authority concerns about risk to patients of the technology broadly, or if the FDA or a foreign regulatory authority finds that the investigational protocol or plan is clearly deficient to meet its stated objectives;
- delays in recruiting, screening and enrolling patients and delays caused by patients withdrawing from clinical trials or failing to return for post-treatment follow-up, including due to the COVID-19 pandemic;
- difficulty collaborating with patient groups and investigators;
- failure by our CROs, other third parties or us to adhere to clinical trial protocols; failure to perform in accordance with the FDA's or any other regulatory authority's good clinical practice requirements, or GCPs, or applicable regulatory guidelines in other countries;
- occurrence of adverse events associated with the product candidate that are viewed to outweigh its potential benefits, or occurrence of adverse events in trial of the same class of agents conducted by other companies;

- changes to the clinical trial protocols;
- clinical sites deviating from trial protocol or dropping out of a trial;
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols;
- changes in the standard of care on which a clinical development plan was based, which may require new or additional trials;
- selection of clinical endpoints that require prolonged periods of observation or analyses of resulting data;
- the cost of clinical trials of our product candidates being greater than we anticipate;
- clinical trials of our product candidates producing negative or inconclusive results, which may result in our deciding, or regulators requiring us, to conduct additional clinical trials or abandon development of such product candidates;
- transfer of manufacturing processes to larger-scale facilities operated by a CMO and delays or failure by our CMOs or us to make any necessary changes to such manufacturing process; and
- third parties being unwilling or unable to satisfy their contractual obligations to us.

In addition, disruptions caused by the COVID-19 pandemic may increase the likelihood that we encounter difficulties or delays in initiating, enrolling, conducting or completing our planned and ongoing clinical trials. For example, due to the COVID-19 pandemic, our Phase 1/2A clinical trial of AT-787 for the treatment of HCV has been paused until our clinical sites are able to re-open and resume enrollment. Any inability to successfully initiate or complete clinical trials could result in additional costs to us or impair our ability to generate revenue from product sales. In addition, if we make manufacturing or formulation changes to our product candidates, we may be required to or we may elect to conduct additional studies to bridge our modified product candidates to earlier versions. Clinical trial delays could also shorten any periods during which any approved products have patent protection and may allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our product candidates and may seriously harm our business.

We could also encounter delays if a clinical trial is suspended or terminated by us, by the data safety monitoring board, or DSMB, for such trial or by the FDA or any other regulatory authority, or if the IRBs of the institutions in which such trials are being conducted suspend or terminate the participation of their clinical investigators and sites subject to their review. Such authorities may suspend or terminate a clinical trial due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a product candidate, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial.

Further, conducting clinical trials in foreign countries, as we have for our COVID-19 and HCV product candidates and expect to do for our dengue product candidate, presents additional risks that may delay completion of our clinical trials. These risks include the failure of enrolled patients in foreign countries to adhere to clinical protocol as a result of differences in healthcare services or cultural customs, managing additional administrative burdens associated with foreign regulatory schemes, as well as political and economic risks relevant to such foreign countries.

Moreover, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and receive compensation in connection with such services. Under certain circumstances, we may be required to report some of these relationships to the FDA or comparable foreign regulatory authorities. The FDA or

comparable foreign regulatory authority may conclude that a financial relationship between us and a principal investigator has created a conflict of interest or otherwise affected interpretation of the study. The FDA or comparable foreign regulatory authority may therefore question the integrity of the data generated at the applicable clinical trial site and the utility of the clinical trial itself may be jeopardized. This could result in a delay in approval, or rejection, of our marketing applications by the FDA or comparable foreign regulatory authority, as the case may be, and may ultimately lead to the denial of marketing approval of one or more of our product candidates.

Delays in the completion of any clinical trial of our product candidates will increase our costs, slow down our product candidate development and approval process and delay or potentially jeopardize our ability to commence product sales and generate product revenue. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates. Any delays to our clinical trials that occur as a result could shorten any period during which we may have the exclusive right to commercialize our product candidates and our competitors may be able to bring products to market before we do, which could significantly reduce the commercial viability of our product candidates. Any of these occurrences may harm our business, financial condition and prospects significantly.

Our product candidates may be associated with serious adverse events, undesirable side effects or have other properties that could halt their clinical development, prevent their regulatory approval, limit their commercial potential or result in significant negative consequences.

Adverse events or other undesirable side effects caused by our product candidates could cause us, any DSMB for a trial, or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or other comparable foreign regulatory authorities.

During the conduct of clinical trials, patients report changes in their health, including illnesses, injuries, and discomforts, to their study doctor. Often, it is not possible to determine whether or not the product candidate being studied caused these conditions. It is possible that as we test our product candidates in larger, longer and more extensive clinical trials, or as use of these product candidates becomes more widespread if they receive regulatory approval, illnesses, injuries, discomforts and other adverse events that were observed in previous trials, as well as conditions that did not occur or went undetected in previous trials, will be reported by patients. Many times, side effects are only detectable after investigational products are tested in large-scale clinical trials or, in some cases, after they are made available to patients on a commercial scale following approval.

If any serious adverse events occur, clinical trials or commercial distribution of any product candidates or products we develop could be suspended or terminated, and our business could be seriously harmed. Treatment-related side effects could also affect patient recruitment and the ability of enrolled patients to complete the trial or result in potential liability claims. Regulatory authorities could order us to cease further development of, deny approval of, or require us to cease selling any product candidates or products for any or all targeted indications. If we are required to delay, suspend or terminate any clinical trial or commercialization efforts, the commercial prospects of such product candidates or products may be harmed, and our ability to generate product revenues from them or other product candidates that we develop may be delayed or eliminated. Additionally, if one or more of our product candidates receives marketing approval and we or others later identify undesirable side effects or adverse events caused by such products, a number of potentially significant negative consequences could result, including but not limited to:

- regulatory authorities may suspend, limit or withdraw approvals of such product, or seek an injunction against its manufacture or distribution;
- regulatory authorities may require additional warnings on the label, including “boxed” warnings, or issue safety alerts, Dear Healthcare Provider letters, press releases or other communications containing warnings or other safety information about the product;

- we may be required to change the way the product is administered or conduct additional clinical trials or post-approval studies;
- we may be required to create a REMS which could include a medication guide outlining the risks of such side effects for distribution to patients;
- we may be subject to fines, injunctions or the imposition of criminal penalties;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of the particular product candidate, if approved, and could seriously harm our business.

We may develop future product candidates in combination with other therapies, which exposes us to additional risks.

We may develop future product candidates in combination with other product candidates or existing therapies. Even if any product candidate we develop was to receive marketing approval or be commercialized for use in combination with other existing therapies, we would continue to be subject to the risks that the FDA or similar foreign regulatory authorities could revoke approval of the therapy used in combination with our product candidate or that safety, efficacy, manufacturing or supply issues could arise with these existing therapies. Combination therapies are commonly used in antiviral treatments, and we would be subject to similar risks if we develop any of our product candidates for use in combination with other drugs or for indications other than currently anticipated. This could result in our own products being removed from the market or being less successful commercially.

We may also evaluate our product candidates in combination with one or more other therapies that have not yet been approved for marketing by the FDA or similar foreign regulatory authorities. We will not be able to market and sell the product candidates we develop in combination with any such unapproved therapies that do not ultimately obtain marketing approval.

If the FDA or similar foreign regulatory authorities do not approve these other drugs or revoke their approval of, or if safety, efficacy, manufacturing, or supply issues arise with, the drugs we choose to evaluate in combination with our product candidates, we may be unable to obtain approval of or market the product candidates we develop.

If we encounter difficulties enrolling patients in our clinical trials, our clinical development activities could be delayed or otherwise adversely affected.

We may experience difficulties in patient enrollment in our clinical trials for a variety of reasons. The timely completion of clinical trials in accordance with their protocols depends, among other things, on our ability to enroll a sufficient number of patients who remain in the trial until its conclusion. The enrollment of patients depends on many factors, including:

- the patient eligibility criteria defined in the protocol;
- the size of the target disease population;
- the size of the patient population required for analysis of the trial’s primary endpoints;
- the proximity of patients to trial sites;
- the design of the trial;

- our ability to recruit clinical trial investigators with the appropriate competencies and experience;
- clinicians' and patients' perceptions as to the potential advantages of the product candidate being studied in relation to other available therapies, including any new products that may be approved for the indications we are investigating;
- our ability to obtain and maintain patient consents;
- the risk that patients enrolled in clinical trials will drop out of the trials before trial completion; and
- other factors outside of our control, such as the COVID-19 pandemic.

For example, due to the COVID-19 pandemic, our Phase 1/2A trial of AT-787 for the treatment of HCV is paused until our clinical sites are able to re-open and resume enrollment. In addition, our clinical trials will compete with other clinical trials for product candidates that are in the same therapeutic areas as our product candidates or similar areas, and this competition will reduce the number and types of patients available to us because some patients who might have opted to enroll in our trials may instead opt to enroll in a trial being conducted by one of our competitors. Since the number of qualified clinical investigators is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials at such clinical trial sites.

Delays in patient enrollment may result in increased costs or may affect the timing or outcome of our ongoing and planned clinical trials, which could prevent completion or commencement of these trials and adversely affect our ability to advance the development of our product candidates.

We currently conduct clinical trials, and may in the future choose to conduct additional clinical trials, of our product candidates in sites outside the United States, and the FDA may not accept data from trials conducted in foreign locations.

We currently conduct, and may in the future choose to conduct, clinical trials outside the United States for our product candidates. Although the FDA may accept data from clinical trials conducted outside the United States, acceptance of this data is subject to certain conditions imposed by the FDA. For example, the clinical trial must be conducted in accordance with GCP, and the FDA must also be able to validate the data from the study through an on-site inspection if necessary. In general, the patient population for any clinical trials conducted outside of the United States must be representative of the population for which we intend to seek approval for the product in the United States. In addition, while these clinical trials are subject to the applicable local laws, the FDA acceptance of the data will be dependent upon its determination that the trials also complied with all applicable U.S. laws and regulations. There can be no assurance the FDA will accept data from trials conducted outside of the United States. If the FDA does not accept the data from our clinical trials of our product candidates, it would likely result in the need for additional trials, which would be costly and time-consuming and delay or permanently halt our development of our product candidates.

In addition, there are risks inherent in conducting clinical trials in multiple jurisdictions, inside and outside of the United States, such as:

- regulatory and administrative requirements of the jurisdiction where the trial is conducted that could burden or limit our ability to conduct our clinical trials;
- foreign exchange fluctuations;
- manufacturing, customs, shipment and storage requirements;
- cultural differences in medical practice and clinical research; and

- the risk that the patient populations in such trials are not considered representative as compared to the patient population in the target markets where approval is being sought.

Interim, "topline" and preliminary data from our clinical trials that we announce or publish from time to time may change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final data.

From time to time, we may publicly disclose preliminary or top-line data from our preclinical studies and clinical trials, which is based on a preliminary analysis of then-available data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the top-line or preliminary results that we report may differ from future results of the same studies, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Top-line data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we previously published. As a result, top-line data should be viewed with caution until the final data are available.

From time to time, we may also disclose interim data from our preclinical studies and clinical trials. Interim data from clinical trials that we may complete are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available or as patients from our clinical trials continue other treatments for their disease. Adverse differences between preliminary or interim data and final data could significantly harm our business prospects. Further, disclosure of interim data by us or by our competitors could result in volatility in the price of our common stock after this offering.

Further, others, including regulatory agencies, may not accept or agree with our assumptions, estimates, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular product candidate or product and our company in general. In addition, the information we choose to publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and you or others may not agree with what we determine is material or otherwise appropriate information to include in our disclosure. If the interim, top-line, or preliminary data that we report differ from actual results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for, and commercialize, our product candidates may be harmed, which could harm our business, operating results, prospects or financial condition.

We may not be successful in our efforts to identify and successfully develop additional product candidates.

Part of our strategy involves identifying novel product candidates. The process by which we identify novel product candidates may fail to yield product candidates for clinical development for a number of reasons, including those discussed in these risk factors and also:

- we may not be able to assemble sufficient resources to acquire or discover additional product candidates;
- competitors may develop alternatives that render our potential product candidates obsolete or less attractive;
- potential product candidates we develop may nevertheless be covered by third-parties' patent or other intellectual property or exclusive rights;
- potential product candidates may, on further study, be shown to have harmful side effects, toxicities or other characteristics that indicate that they are unlikely to be products that will receive marketing approval or achieve market acceptance, if approved;

- potential product candidates may not be effective in treating their targeted diseases or symptoms;
- the market for a potential product candidate may change so that the continued development of that product candidate is no longer reasonable;
- a potential product candidate may not be capable of being produced in commercial quantities at an acceptable cost, or at all; or
- the regulatory pathway for a potential product candidate is highly complex and difficult to navigate successfully or economically.

If we are unable to identify and successfully commercialize additional suitable product candidates, this would adversely impact our business strategy and our financial position.

We may focus on potential product candidates that may prove to be unsuccessful and we may have to forego opportunities to develop other product candidates that may prove to be more successful.

We may choose to focus our efforts and resources on a potential product candidate that ultimately proves to be unsuccessful, or to license or purchase a marketed product that does not meet our financial expectations. As a result, we may fail to capitalize on viable commercial products or profitable market opportunities, be required to forego or delay pursuit of opportunities with other product candidates or other diseases that may later prove to have greater commercial potential, or relinquish valuable rights to such product candidates through collaboration, licensing or other royalty arrangements in cases in which it would have been advantageous for us to retain sole development and commercialization rights. For example, we have allocated certain resources that could be used to develop AT-787 for the treatment of chronic HCV to prioritize development of AT-527 for the treatment of COVID-19. If we are unable to identify and successfully commercialize additional suitable product candidates, this would adversely impact our business strategy and our financial position.

Furthermore, we have limited financial and personnel resources and are placing significant focus on the development of our lead product candidates, particularly AT-527, and as such, we may forgo or delay pursuit of opportunities with other future product candidates that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and other future product candidates for specific indications may not yield any commercially viable future product candidates. If we do not accurately evaluate the commercial potential or target market for a particular future product candidate, we may relinquish valuable rights to those future product candidates through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such future product candidates.

A Breakthrough Therapy designation by the FDA, even if granted for any of our product candidates, may not lead to a faster development or regulatory review or approval process, and it does not increase the likelihood that our product candidates will receive marketing approval.

We may seek a Breakthrough Therapy designation for our product candidates if the clinical data support such a designation for one or more product candidates. A breakthrough therapy is defined as a drug or biologic that is intended, alone or in combination with one or more other drugs or biologics, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For product candidates that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor can help to identify the most efficient path for clinical development. Drugs designated as breakthrough therapies by the FDA may also be eligible for priority review.

Designation as a breakthrough therapy is within the discretion of the FDA. Accordingly, even if we believe one of our product candidates meets the criteria for designation as a breakthrough therapy, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of a Breakthrough Therapy designation for a product candidate may not result in a faster development process, review or approval compared to drugs considered for approval under non-expedited FDA review procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of our product candidates qualify as breakthrough therapies, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

We may attempt to secure FDA approval of certain product candidates through the use of the accelerated approval pathway. If we are unable to obtain such approval, we may be required to conduct additional preclinical studies or clinical trials beyond those that we contemplate, which could increase the expense of obtaining, and delay the receipt of, necessary marketing approvals. Even if we receive accelerated approval from the FDA, if our confirmatory trials do not verify clinical benefit, or if we do not comply with rigorous post-marketing requirements, the FDA may seek to withdraw accelerated approval.

We are developing certain product candidates for the treatment of serious and life-threatening conditions, including AT-527 for the treatment of COVID-19 and therefore may decide to seek approval of such product candidates under the FDA's accelerated approval pathway. A product may be eligible for accelerated approval if it is designed to treat a serious or life-threatening disease or condition and generally provides a meaningful advantage over available therapies upon a determination that the product candidate has an effect on a surrogate endpoint or intermediate clinical endpoint that is reasonably likely to predict clinical benefit. The FDA considers a clinical benefit to be a positive therapeutic effect that is clinically meaningful in the context of a given disease, such as irreversible morbidity or mortality. For the purposes of accelerated approval, a surrogate endpoint is a marker, such as a laboratory measurement, radiographic image, physical sign, or other measure that is thought to predict clinical benefit, but is not itself a measure of clinical benefit. An intermediate clinical endpoint is a clinical endpoint that can be measured earlier than an effect on irreversible morbidity or mortality that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit.

The accelerated approval pathway may be used in cases in which the advantage of a new drug over available therapy may not be a direct therapeutic advantage, but is a clinically important improvement from a patient and public health perspective. If granted, accelerated approval is usually contingent on the sponsor's agreement to conduct, in a diligent manner, additional post-approval confirmatory studies to verify and describe the drug's clinical benefit. If the sponsor fails to conduct such studies in a timely manner, or if such post-approval studies fail to verify the drug's predicted clinical benefit, the FDA may withdraw its approval of the drug on an expedited basis.

If we decide to submit an NDA seeking accelerated approval or receive an expedited regulatory designation for our product candidates, there can be no assurance that such submission or application will be accepted or that any expedited development, review or approval will be granted on a timely basis, or at all. Failure to obtain accelerated approval or any other form of expedited development, review or approval for a product candidate would result in a longer time period to commercialization of such product candidate, if any, and could increase the cost of development of such product candidate, which could harm our competitive position in the marketplace.

Even if we complete the necessary preclinical studies and clinical trials, the marketing approval process is expensive, time-consuming and uncertain and may prevent us or any future collaboration partners from obtaining approvals for the commercialization of any product candidate we develop.

Any product candidate we may develop and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling,

storage, approval, advertising, promotion, sale and distribution, are subject to comprehensive regulation by the FDA and other regulatory authorities in the United States and by comparable authorities in other countries. Any product candidates we develop may not be effective, may be only moderately effective, or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining marketing approval or prevent or limit commercial use. Failure to obtain marketing approval for a product candidate will prevent us from commercializing the product candidate in a given jurisdiction. Our development programs are early-stage and we have not received approval to market any product candidates from regulatory authorities in any jurisdiction. It is possible that none of the product candidates we are developing or that we may seek to develop in the future will ever obtain regulatory approval. We have no experience in filing and supporting the applications necessary to gain marketing approvals and expect to rely on third-party CROs, suppliers, vendors or regulatory consultants to assist us in this process. Securing regulatory approval requires the submission of extensive preclinical and clinical data and supporting information to the various regulatory authorities for each therapeutic indication to establish the product candidate's safety and efficacy. Securing regulatory approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the relevant regulatory authority.

The process of obtaining marketing approvals, both in the United States and abroad, is expensive, may take many years if numerous clinical trials are required, if approval is obtained at all, and can vary substantially based upon a variety of factors, including the type, complexity and novelty of the product candidates involved. Changes in marketing approval policies during the development period, changes in or the enactment of additional statutes or regulations, or changes in regulatory review for each submitted product application, may cause delays in the approval or rejection of an application. The FDA and comparable authorities in other countries have substantial discretion in the approval process and may refuse to accept any application or may decide that our data are insufficient for approval and require additional preclinical, clinical or other studies. In addition, varying interpretations of the data obtained from preclinical and clinical testing could delay, limit or prevent marketing approval of a product candidate. Any marketing approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable.

If we experience delays in obtaining approval or if we fail to obtain approval of any product candidates we may develop, the commercial prospects for those product candidates may be harmed, and our ability to generate product revenue will be materially impaired.

Even if we obtain FDA approval of any of our product candidates, we may never obtain approval or commercialize such products outside of the United States, which would limit our ability to realize their full market potential.

In order to market any products outside of the United States, we must establish and comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy. Clinical trials conducted in one country may not be accepted by regulatory authorities in other countries, and regulatory approval in one country does not mean that regulatory approval will be obtained in any other country. Approval procedures vary among countries and can involve additional product testing and validation and additional administrative review periods. Seeking foreign regulatory approvals could result in significant delays, difficulties and costs for us and may require additional preclinical studies or clinical trials which would be costly and time-consuming. Regulatory requirements can vary widely from country to country and could delay or prevent the introduction of our products in those countries. Satisfying these and other regulatory requirements is costly, time-consuming, uncertain and subject to unanticipated delays. In addition, our failure to obtain regulatory approval in any country may delay or have negative effects on the process for regulatory approval in other countries. We do not have any product candidates approved for sale in any jurisdiction, including international markets, and we do not have experience in obtaining regulatory approval in international markets. If we fail to comply with

regulatory requirements in international markets or to obtain and maintain required approvals, our ability to realize the full market potential of our products will be harmed.

Even if a current or future product candidate receives marketing approval, it may fail to achieve the degree of market acceptance by physicians, patients, third-party payors and others in the medical community necessary for commercial success.

If any current or future product candidate we develop receives marketing approval, whether as a single agent or in combination with other therapies, it may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors and others in the medical community. For example, current approved antiviral products are well established in the medical community for the treatment of HCV, and doctors may continue to rely on these therapies. If the product candidates we develop do not achieve an adequate level of acceptance, we may not generate significant product revenues and we may not become profitable. The degree of market acceptance of any product candidate, if approved for commercial sale, will depend on a number of factors, including:

- efficacy and potential advantages compared to alternative treatments;
- the ability to offer our products, if approved, for sale at competitive prices;
- convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the strength of marketing and distribution support;
- the ability to obtain sufficient third-party coverage and adequate reimbursement, including with respect to the use of the approved product as a combination therapy;
- adoption of a companion diagnostic and/or complementary diagnostic; and
- the prevalence and severity of any side effects.

Disruptions at the FDA and other government agencies caused by funding shortages or global health concerns could hinder their ability to hire, retain or deploy key leadership and other personnel, or otherwise prevent new or modified products from being developed, approved or commercialized in a timely manner or at all, which could negatively impact our business.

The ability of the FDA to review or approve new products can be affected by a variety of factors, including government budget and funding levels, statutory, regulatory, and policy changes, the FDA's ability to hire and retain key personnel and accept the payment of user fees, and other events that may otherwise affect the FDA's ability to perform routine functions. Average review times at the FDA have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable. Disruptions at the FDA and other agencies may also slow the time necessary for new drugs to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, including for 35 days beginning on December 22, 2018, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA employees and stop critical activities.

Separately, in response to the COVID-19 pandemic, on March 10, 2020, the FDA announced its intention to postpone most inspections of foreign manufacturing facilities and, on March 18, 2020, the FDA temporarily

postponed routine surveillance inspections of domestic manufacturing facilities. Subsequently, on July 10, 2020, the FDA announced its intention to resume certain on-site inspections of domestic manufacturing facilities subject to a risk-based prioritization system. The FDA intends to use this risk-based assessment system to identify the categories of regulatory activity that can occur within a given geographic area, ranging from mission critical inspections to resumption of all regulatory activities. Regulatory authorities outside the United States may adopt similar restrictions or other policy measures in response to the COVID-19 pandemic. If a prolonged government shutdown occurs, or if global health concerns continue to prevent the FDA or other regulatory authorities from conducting their regular inspections, reviews, or other regulatory activities, it could significantly impact the ability of the FDA or other regulatory authorities to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

Our insurance policies are expensive and protect us only from some business risks, which leaves us exposed to significant uninsured liabilities.

Though we have insurance coverage for clinical trial product liability, we do not carry insurance for all categories of risk that our business may encounter. Some of the policies we currently maintain include general liability, property, auto, workers' compensation, umbrella, and directors' and officers' insurance.

Any additional product liability insurance coverage we acquire in the future may not be sufficient to reimburse us for any expenses or losses we may suffer. Moreover, insurance coverage is becoming increasingly expensive and in the future we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. If we obtain marketing approval for any of our product candidates, we intend to acquire insurance coverage to include the sale of commercial products; however, we may be unable to obtain product liability insurance on commercially reasonable terms or in adequate amounts. A successful product liability claim or series of claims brought against us could cause our stock price to decline
and, if judgments exceed our insurance coverage, could adversely affect our results of operations and business, including preventing or limiting the development and commercialization of any product candidates we develop. We do not carry specific biological or hazardous waste insurance coverage, and our property, casualty and general liability insurance policies specifically exclude coverage for damages and fines arising from biological or hazardous waste exposure or contamination. Accordingly, in the event of contamination or injury, we could be held liable for damages or be penalized with fines in an amount exceeding our resources, and our clinical trials or regulatory approvals could be suspended.

We also expect that operating as a public company will make it more difficult and more expensive for us to obtain director and officer liability insurance, and we may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. As a result, it may be more difficult for us to attract and retain qualified people to serve on our board of directors, our board committees or as executive officers. We do not know, however, if we will be able to maintain existing insurance with adequate levels of coverage. Any significant uninsured liability may require us to pay substantial amounts, which would adversely affect our cash and cash equivalents position and results of operations.

Our business and operations would suffer in the event of system failures, deficiencies or intrusions.

Our computer systems, as well as those of our CROs and other contractors and consultants, are vulnerable to failure or damage from computer viruses and other malware, unauthorized access or other cybersecurity attacks, natural disasters (including hurricanes), terrorism, war, fire and telecommunication or electrical failures. In the ordinary course of our business, we directly or indirectly collect, store and transmit sensitive data, including intellectual property, confidential information, preclinical and clinical trial data, proprietary business information, personal data and personally identifiable health information of our clinical trial subjects and employees, in our data centers and on our networks, or on those of third parties. The secure processing,

maintenance and transmission of this information is critical to our operations. Despite our security measures, our information technology and infrastructure may be vulnerable to attacks by hackers or internal bad actors, or breached due to employee error, a technical vulnerability, malfeasance or other disruptions. The risk of a security breach or disruption, particularly through cyber-attacks or cyber intrusion, including by computer hackers, foreign governments, and cyber terrorists, has generally increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. We may not be able to anticipate all types of security threats, nor may we be able to implement preventive measures effective against all such security threats. The techniques used by cyber criminals change frequently, may not be recognized until launched and can originate from a wide variety of sources, including outside groups such as external service providers, organized crime affiliates, terrorist organizations or hostile foreign governments or agencies. We cannot assure you that our data protection efforts and our investment in information technology will prevent significant breakdowns, data leakages or breaches in our systems or those of our CROs and other contractors and consultants.

If such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our product candidate development programs. For example, the loss of preclinical studies or clinical trial data from completed, ongoing or planned studies or trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of or damage to our data or applications, or inappropriate disclosure of personal, confidential or proprietary information, we could incur liability and the further development of our product candidates could be delayed. Although, to our knowledge, we have not experienced any such material security breach to date, any such breach could compromise our networks and the information stored there could be accessed, publicly disclosed, lost or stolen.

Any such access, disclosure or other loss of information could result in legal claims or proceedings, liability under laws that protect the privacy of personal information and significant regulatory penalties, and such an event could disrupt our operations, damage our reputation and cause a loss of confidence in us and our ability to conduct clinical trials, which could adversely affect our reputation and delay our clinical development of our product candidates.

Risks Related to Healthcare Laws and Other Legal Compliance Matters

We will be subject to extensive and costly government regulation.

Our product candidates will be subject to extensive and rigorous domestic government regulation, including regulation by the FDA, the Centers for Medicare & Medicaid Services, or CMS, other divisions of the U.S. Department of Health and Human Services, the U.S. Department of Justice, state and local governments, and their respective equivalents outside of the United States. The FDA regulates the research, development, preclinical and clinical testing, manufacture, safety, effectiveness, record-keeping, reporting, labeling, packaging, storage, approval, advertising, promotion, sale, distribution, import and export of pharmaceutical products. If our products are marketed abroad, they will also be subject to extensive regulation by foreign governments, whether or not they have obtained FDA approval for a given product and its uses. Such foreign regulation may be equally or more demanding than corresponding United States regulation.

Government regulation substantially increases the cost and risk of researching, developing, manufacturing and selling our products. The regulatory review and approval process, which includes preclinical testing and clinical trials of each product candidate, is lengthy, expensive and uncertain. We must obtain and maintain regulatory authorization to conduct preclinical studies and clinical trials. We must obtain regulatory approval for each product we intend to market, and the manufacturing facilities used for the products must be inspected and meet legal requirements. Securing regulatory approval requires the submission of extensive preclinical and clinical data and other supporting information for each proposed therapeutic indication in order to establish

the product's safety and efficacy, potency and purity, for each intended use. The development and approval process takes many years, requires substantial resources, and may never lead to the approval of a product.

Even if we are able to obtain regulatory approval for a particular product, the approval may limit the indicated medical uses for the product, may otherwise limit our ability to promote, sell and distribute the product, may require that we conduct costly post-marketing surveillance, and/or may require that we conduct ongoing post-marketing studies. Material changes to an approved product, such as, for example, manufacturing changes or revised labeling, may require further regulatory review and approval. Once obtained, any approvals may be withdrawn, including, for example, if there is a later discovery of previously unknown problems with the product, such as a previously unknown safety issue.

If we, our consultants, CMOs, CROs or other vendors, fail to comply with applicable regulatory requirements at any stage during the regulatory process, such noncompliance could result in, among other things, delays in the approval of applications or supplements to approved applications; refusal of a regulatory authority, including the FDA, to review pending market approval applications or supplements to approved applications; warning letters; fines; import and/or export restrictions; product recalls or seizures; injunctions; total or partial suspension of production; civil penalties; withdrawals of previously approved marketing applications or licenses; recommendations by the FDA or other regulatory authorities against governmental contracts; and/or criminal prosecutions.

Enacted and future healthcare legislation and policies may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and could adversely affect our business.

In the United States, the EU and other jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes and proposed changes to the healthcare system that could prevent or delay marketing approval of our products in development, restrict or regulate post-approval activities involving any product candidates for which we obtain marketing approval, impact pricing and reimbursement and impact our ability to sell any such products profitably. In particular, there have been and continue to be a number of initiatives at the U.S. federal and state levels that seek to reduce healthcare costs and improve the quality of healthcare. In addition, new regulations and interpretations of existing healthcare statutes and regulations are frequently adopted.

In March 2010, the Patient Protection and Affordable Care Act, or ACA, was enacted, which substantially changed the way healthcare is financed by both governmental and private insurers. Among the provisions of the ACA, those of greatest importance to the pharmaceutical and biotechnology industries include the following:

- an annual, non-deductible fee payable by any entity that manufactures or imports certain branded prescription drugs and biologic agents (other than those designated as orphan drugs), which is apportioned among these entities according to their market share in certain government healthcare programs;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program to 23.1% and 13.0% of the average manufacturer price for branded and generic drugs, respectively;
- a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected;
- extension of a manufacturer's Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;

- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to certain individuals with income at or below 133% of the federal poverty level, thereby potentially increasing a manufacturer's Medicaid rebate liability;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; and
- establishment of the Center for Medicare and Medicaid Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

Since its enactment, there have been judicial, Congressional and executive challenges to certain aspects of the ACA, and we expect there will be additional challenges and amendments to the ACA in the future. By way of example, in 2017, President Trump signed into law federal tax legislation commonly referred to as the Tax Cuts and Jobs Act, or the Tax Act, which included a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate". On December 14, 2018, the U.S. District Court for the Northern District of Texas ruled that the ACA is unconstitutional in its entirety because the penalty imposed by the individual mandate, which was deemed an integral part of the ACA, was reduced to $0 and effectively nullified by Congress as part of the Tax Act. Additionally, on December 18, 2019, the U.S. Court of Appeals for the Fifth Circuit ruled that the individual mandate was unconstitutional and remanded the case back to the District Court to determine whether the remaining provisions of the ACA are invalid as well. On March 2, 2020, the United States Supreme Court granted the petitions for writs of certiorari to review this case, although it remains unclear how and when the Supreme Court will rule. On June 14, 2018, the U.S. Court of Appeals for the Federal Circuit ruled that the federal government was not required to pay more than $12 billion in ACA risk corridor payments to third-party payors who argued that these payments were owed to them. This was appealed to the Supreme Court, who reversed the Federal Circuit's decision on April 27, 2020, and ruled that the government must make risk corridor payments. It is unclear how other efforts to challenge, repeal or replace the ACA will impact the ACA or our business.

In addition, other legislative changes have been proposed and adopted in the United States since the ACA was enacted. In August 2011, the Budget Control Act of 2011 resulted in aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013. The Coronavirus Aid, Relief and Economic Security Act, or CARES Act, which was signed into law in March 2020 and was designed to provide financial support and resources to individuals and businesses affected by the COVID-19 pandemic, suspended the 2% reductions from May 1, 2020 through December 31, 2020, and extended the sequester by one year, through 2030. In addition, in January 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several types of providers, including hospitals, imaging centers and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. Additionally, the orphan drug tax credit was reduced as part of a broader tax reform. These new laws or any other similar laws introduced in the future may result in additional reductions in Medicare and other healthcare funding, which could negatively affect our customers and accordingly, our financial operations.

Moreover, payment methodologies may be subject to changes in healthcare legislation and regulatory initiatives. For example, CMS may develop new payment and delivery models, such as outcomes-based reimbursement. In addition, recently there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several U.S. Congressional inquiries and proposed and enacted federal legislation designed to, among other things, bring more

transparency to drug pricing, reduce the cost of prescription drugs under Medicare, and review the relationship between pricing and manufacturer patient programs. We expect that additional U.S. federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that the U.S. federal government will pay for healthcare products and services, which could result in reduced demand for our product candidates or additional pricing pressures.

Individual states in the United States have also increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access, and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. Legally mandated price controls on payment amounts by third-party payors or other restrictions could harm our business, results of operations, financial condition and prospects. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. This could reduce the ultimate demand for our product candidates or put pressure on our product pricing.

In the EU, similar political, economic and regulatory developments may affect our ability to profitably commercialize our product candidates, if approved. In addition to continuing pressure on prices and cost containment measures, legislative developments at the EU or member state level may result in significant additional requirements or obstacles that may increase our operating costs. The delivery of healthcare in the EU, including the establishment and operation of health services and the pricing and reimbursement of medicines, is almost exclusively a matter for national, rather than EU, law and policy. National governments and health service providers have different priorities and approaches to the delivery of healthcare and the pricing and reimbursement of products in that context. In general, however, the healthcare budgetary constraints in most EU member states have resulted in restrictions on the pricing and reimbursement of medicines by relevant health service providers. Coupled with ever-increasing EU and national regulatory burdens on those wishing to develop and market products, this could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to commercialize our product candidates, if approved.

In markets outside of the United States and the EU, reimbursement and healthcare payment systems vary significantly by country, and many countries have instituted price ceilings on specific products and therapies.

In addition, in the United States, legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether the FDA's regulations, guidance or interpretations will be changed, or what the impact of such changes on the marketing approvals of our product candidates, if any, may be. In addition, increased scrutiny by Congress of the FDA's approval process may significantly delay or prevent marketing approval, as well as subject us to more stringent product labeling and post-marketing testing and other requirements.

We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action in the United States, the EU or any other jurisdiction. If we or any third parties we may engage are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we or such third parties are not able to maintain regulatory compliance, our product candidates may lose any regulatory approval that may have been obtained and we may not achieve or sustain profitability.

Even if we obtain regulatory approval for a product candidate, our products will remain subject to regulatory scrutiny and post-marketing requirements.

Any regulatory approvals that we may receive for our product candidates will require the submission of reports to regulatory authorities and surveillance to monitor the safety and efficacy of the product candidate, may contain significant limitations related to use restrictions for specified age groups, warnings, precautions or contraindications, and may include burdensome post-approval study or risk management requirements. For example, the FDA may require a REMS in order to approve our product candidates, which could entail requirements for a medication guide, physician training and communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. In addition, if one of our product candidates is approved, it will be subject to ongoing regulatory requirements for manufacturing, labeling, packaging, storage, advertising, promotion, sampling, record-keeping, conduct of post-marketing studies and submission of safety, efficacy, and other post- market information, including both federal and state requirements in the United States and requirements of comparable foreign regulatory authorities. Manufacturers and manufacturers' facilities are required to comply with extensive FDA and comparable foreign regulatory authority requirements, including ensuring that quality control and manufacturing procedures conform to cGMP regulations. As such, we and our contract manufacturers will be subject to continual review and inspections to assess compliance with cGMP and adherence to commitments made in any approved marketing application. Accordingly, we and others with whom we work must continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, production and quality control.

If the FDA or another regulatory authority discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, or disagrees with the promotion, marketing or labeling of a product, such regulatory authorities may impose restrictions on that product or us, including requiring withdrawal of the product from the market. If we fail to comply with applicable regulatory requirements, a regulatory authority or enforcement authority may, among other things:

- issue warning letters;
- impose civil or criminal penalties;
- suspend or withdraw regulatory approval;
- suspend any of our clinical trials;
- refuse to approve pending applications or supplements to approved applications submitted by us;
- impose restrictions on our operations, including closing our contract manufacturers' facilities; or
- seize or detain products, or require a product recall.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. Any failure to comply with ongoing regulatory requirements may adversely affect our ability to commercialize and generate revenue from our products. If regulatory sanctions are applied or if regulatory approval is withdrawn, our business will be seriously harmed.

Moreover, the policies of the FDA and of other regulatory authorities may change, and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or executive action, either in the United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability.

The FDA and other regulatory agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses.

If any of our product candidates are approved and we are found to have improperly promoted off-label uses of those products, we may become subject to significant liability. The FDA and other regulatory agencies strictly regulate the promotional claims that may be made about prescription products, such as our product candidates, if approved. In particular, a product may not be promoted for uses that are not approved by the FDA or such other regulatory agencies as reflected in the product's approved labeling. If we receive marketing approval for a product candidate, physicians may nevertheless prescribe it to their patients in a manner that is inconsistent with the approved label. If we are found to have promoted such off-label uses, we may become subject to significant liability. The U.S. federal government has levied large civil and criminal fines against companies for alleged improper promotion of off-label use and has enjoined several companies from engaging in off-label promotion. The FDA has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed. If we cannot successfully manage the promotion of our product candidates, if approved, we could become subject to significant liability, which would materially adversely affect our business and financial condition.

Our business operations and current and future relationships with investigators, healthcare professionals, consultants, third-party payors, patient organizations and customers will be subject to applicable healthcare regulatory laws, which could expose us to penalties.

Our business operations and current and future arrangements with investigators, healthcare professionals, consultants, third-party payors, patient organizations and customers, may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations. These laws may constrain the business or financial arrangements and relationships through which we conduct our operations, including how we research, market, sell and distribute our product candidates, if approved. Such laws include:

- the U.S. federal Anti-Kickback Statute, which makes it illegal for any person to knowingly and willfully solicit, offer, receive, pay or provide any remuneration (including any kickback, bribe or certain rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, lease, order or recommendation of, any good, facility, item or service, for which payment may be made, in whole or in part, under U.S. federal and state healthcare programs such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- the U.S. federal civil and criminal false claims laws, including the civil False Claims Act, or FCA, which prohibit individuals or entities from, among other things, knowingly presenting, or causing to be presented, to the U.S. federal government, claims for payment or approval that are false, fictitious or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim, or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the U.S. federal government. Manufacturers can be held liable under the FCA even when they do not submit claims directly to government payors if they are deemed to "cause" the submission of false or fraudulent claims. The government may deem manufacturers to have "caused" the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers or promoting a product off-label. Companies that submit claims directly to payors may also be liable under the FCA for the direct submission of such claims. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the FCA. The FCA also permits a private individual acting as a "whistleblower" to bring actions on behalf of the federal government alleging violations of the FCA and to share in any monetary recovery. When an entity is determined to have violated the FCA, the government may

impose civil fines and penalties for each false claim, plus treble damages, and exclude the entity from participation in Medicare, Medicaid and other federal healthcare programs;

- the federal civil monetary penalties laws, which impose civil fines for, among other things, the offering or transfer of remuneration to a Medicare or state healthcare program beneficiary if the person knows or should know it is likely to influence the beneficiary's selection of a particular provider, practitioner or supplier of services reimbursable by Medicare or a state healthcare program, unless an exception applies;
- the U.S. federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, and its implementing regulations, which created additional federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program or obtain, by means of false or fraudulent pretenses, representations, or promises, any of the money or property owned by, or under the custody or control of, any healthcare benefit program, regardless of the payor (e.g., public or private) and knowingly and willfully falsifying, concealing or covering up by any trick or device a material fact or making any materially false statements in connection with the delivery of, or payment for, healthcare benefits, items or services relating to healthcare matters. Similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- the Federal Food, Drug and Cosmetic Act, or FDCA, which prohibits, among other things, the adulteration or misbranding of drugs, biologics and medical devices;
- the U.S. Physician Payments Sunshine Act and its implementing regulations, which requires certain manufacturers of drugs, devices, biologics and medical supplies that are reimbursable under Medicare, Medicaid or the Children's Health Insurance Program to report annually to the government information related to certain payments and other transfers of value to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), certain other healthcare providers starting in 2022, and teaching hospitals, as well as ownership and investment interests held by the physicians described above and their immediate family members;
- federal price reporting laws, which require manufacturers to calculate and report complex pricing metrics to government programs, where reported prices may be used in the calculation of reimbursement and/or discounts on approved products;
- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers;
- analogous U.S. state laws and regulations, including: state anti-kickback and false claims laws, which may apply to our business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by any third-party payor, including private insurers; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information, which requires tracking gifts and other remuneration and items of value provided to healthcare professionals and entities; and state and local laws that require the registration of pharmaceutical sales representatives; and
- similar healthcare laws and regulations in the EU and other jurisdictions, including reporting requirements detailing interactions with and payments to healthcare providers.

Ensuring that our internal operations and future business arrangements with third parties comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices, including our relationships with physicians and other healthcare providers, some of whom are compensated in the form of stock or stock options for services provided to us and may be in the position to influence the ordering of or use of our product candidates, if approved, may not comply with current or future statutes, regulations, agency guidance or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of the laws described above or any other governmental laws and regulations that may apply to us, we may be subject to significant penalties, including civil, criminal and administrative penalties, damages, fines, exclusion from government-funded healthcare programs, such as Medicare and Medicaid or similar programs in other countries or jurisdictions, integrity oversight and reporting obligations to resolve allegations of non-compliance, disgorgement, individual imprisonment, contractual damages, reputational harm, diminished profits and the curtailment or restructuring of our operations. If any of the physicians or other providers or entities with whom we expect to do business are found to not be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs and imprisonment, which could affect our ability to operate our business. Further, defending against any such actions can be costly, time-consuming and may require significant personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

We are subject to governmental regulation and other legal obligations, particularly related to privacy, data protection and information security, and we are subject to consumer protection laws that regulate our marketing practices and prohibit unfair or deceptive acts or practices. Our actual or perceived failure to comply with such obligations could harm our business.

We are subject to diverse laws and regulations relating to data privacy and security, including, in the United States, HIPAA, and, in the EU and the European Economic Area, or EEA, Regulation 2016/679, known as the General Data Protection Regulation, or GDPR. New privacy rules are being enacted in the United States and globally, and existing ones are being updated and strengthened. For example, on June 28, 2018, California enacted the California Consumer Privacy Act, or CCPA, which took effect on January 1, 2020. The CCPA creates individual privacy rights for California consumers, increases the privacy and security obligations of entities handling certain personal information, requires new disclosures to California individuals and affording such individuals new abilities to opt out of certain sales of personal information, and provides for civil penalties for violations as well as a private right of action for data breaches that is expected to increase data breach litigation. Complying with these numerous, complex and often changing regulations is expensive and difficult, and failure to comply with any privacy laws or data security laws or any security incident or breach involving the misappropriation, loss or other unauthorized processing, use or disclosure of sensitive or confidential patient, consumer or other personal information, whether by us, one of our CROs or business associates or another third party, could adversely affect our business, financial condition and results of operations, including but not limited to: investigation costs; material fines and penalties; compensatory, special, punitive and statutory damages; litigation; consent orders regarding our privacy and security practices; requirements that we provide notices, credit monitoring services and/or credit restoration services or other relevant services to impacted individuals; adverse actions against our licenses to do business; reputational damage; and injunctive relief.

The privacy laws in the EU have been significantly reformed in recent years. On May 25, 2018, the GDPR entered into force and became directly applicable in all EU member states. The GDPR implements more stringent operational requirements than its predecessor legislation. For example, the GDPR applies extraterritorially, requires us to make more detailed disclosures to data subjects, requires disclosure of the legal basis on which we can process personal data, makes it harder for us to obtain valid consent for collecting and processing

personal data, requires the appointment of data protection officers when sensitive personal data, such as health data, is processed on a large scale, provides more robust rights for data subjects, introduces mandatory data breach notification through the EU, imposes additional obligations on us when contracting with service providers and requires us to adopt appropriate privacy governance, including policies, procedures, training and data audit. The GDPR provides that EU member states may establish their own laws and regulations limiting the processing of personal data, including genetic, biometric or health data, which could limit our ability to use and share personal data or could cause our costs to increase. Additionally, following the United Kingdom's withdrawal from the EU, which is commonly referred to as Brexit, beginning in 2021 we will have to comply with the GDPR and the United Kingdom GDPR, each regime having the ability to fine up to the greater of €20 million or 4% of global turnover for violations. The relationship between the United Kingdom and the EU in relation to certain aspects of data protection law remains unclear, for example around how data can lawfully be transferred between each jurisdiction, which exposes us to further compliance risk. In addition, we may be the subject of litigation and/or adverse publicity, which could adversely affect our business, results of operations and financial condition.

We cannot assure you that our CROs or other third-party service providers with access to our or our customers', suppliers', trial patients' and employees' personally identifiable and other sensitive or confidential information in relation to which we are responsible will not breach contractual obligations imposed by us, or that they will not experience data security breaches or attempts thereof, which could have a corresponding effect on our business, including putting us in breach of our obligations under privacy laws and regulations and/or which could in turn adversely affect our business, results of operations and financial condition. We cannot assure you that our contractual measures and our own privacy and security-related safeguards will protect us from the risks associated with the third-party processing, use, storage and transmission of such information. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations, and prospects.

We face potential liability related to the privacy of health information we obtain from clinical trials sponsored by us.

Most healthcare providers, including research institutions from which we obtain patient health information, are subject to privacy and security regulations promulgated under HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act. We do not believe that we are currently classified as a covered entity or business associate under HIPAA and thus are not directly subject to its requirements or penalties. However, any person may be prosecuted under HIPAA's criminal provisions either directly or under aiding-and-abetting or conspiracy principles. Consequently, depending on the facts and circumstances, we could face substantial criminal penalties if we knowingly receive individually identifiable health information from a HIPAA-covered healthcare provider or research institution that has not satisfied HIPAA's requirements for disclosure of individually identifiable health information. Even when HIPAA does not apply, according to the Federal Trade Commission, or the FTC, failing to take appropriate steps to keep consumers' personal information secure constitutes unfair acts or practices in or affecting commerce in violation of the Federal Trade Commission Act. The FTC expects a company's data security measures to be reasonable and appropriate in light of the sensitivity and volume of consumer information it holds, the size and complexity of its business, and the cost of available tools to improve security and reduce vulnerabilities. Individually identifiable health information is considered sensitive data that merits stronger safeguards.

In addition, we may maintain sensitive personally identifiable information, including health information, that we receive throughout the clinical trial process, in the course of our research collaborations. As such, we may be subject to state laws, including the CCPA, requiring notification of affected individuals and state regulators in the event of a breach of personal information, which is a broader class of information than the health

information protected by HIPAA. Our clinical trial programs outside the United States may implicate international data protection laws, including the GDPR and legislation of the EU member states implementing it.

Our activities outside the United States impose additional compliance requirements and generate additional risks of enforcement for noncompliance. Failure by our CROs and other third-party contractors to comply with the strict rules on the transfer of personal data outside of the EU into the United States may result in the imposition of criminal and administrative sanctions on such collaborators, which could adversely affect our business. Furthermore, certain health privacy laws, data breach notification laws, consumer protection laws and genetic testing laws may apply directly to our operations and/or those of our collaborators and may impose restrictions on our collection, use and dissemination of individuals' health information.

Moreover, patients about whom we or our collaborators obtain health information, as well as the providers who share this information with us, may have statutory or contractual rights that limit our ability to use and disclose the information. We may be required to expend significant capital and other resources to ensure ongoing compliance with applicable privacy and data security laws. Claims that we have violated individuals' privacy rights or breached our contractual obligations, even if we are not found liable, could be expensive and time-consuming to defend and could result in adverse publicity that could harm our business.

If we or third-party CMOs, CROs or other contractors or consultants fail to comply with applicable federal, state or local regulatory privacy requirements, we could be subject to a range of regulatory actions that could affect our or our contractors' ability to develop and commercialize our product candidates and could harm or prevent sales of any affected products that we are able to commercialize, or could substantially increase the costs and expenses of developing, commercializing and marketing our products. Any threatened or actual government enforcement action could also generate adverse publicity and require that we devote substantial resources that could otherwise be used in other aspects of our business. Increasing use of social media could give rise to liability, breaches of data security or reputational damage. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations and prospects.

We are subject to environmental, health and safety laws and regulations, and we may become exposed to liability and substantial expenses in connection with environmental compliance or remediation activities.

Our operations, including our development, testing and manufacturing activities, are subject to numerous environmental, health and safety laws and regulations. These laws and regulations govern, among other things, the controlled use, handling, release and disposal of and the maintenance of a registry for, hazardous materials and biological materials, such as chemical solvents, human cells, carcinogenic compounds, mutagenic compounds and compounds that have a toxic effect on reproduction, laboratory procedures and exposure to blood-borne pathogens. If we fail to comply with such laws and regulations, we could be subject to fines or other sanctions.

As with other companies engaged in activities similar to ours, we face a risk of environmental liability inherent in our current and historical activities, including liability relating to releases of or exposure to hazardous or biological materials. Environmental, health and safety laws and regulations are becoming more stringent. We may be required to incur substantial expenses in connection with future environmental compliance or remediation activities, in which case, the production efforts of our third-party manufacturers or our development efforts may be interrupted or delayed.

We and our employees are increasingly utilizing social media tools as a means of communication both internally and externally.

Despite our efforts to monitor evolving social media communication guidelines and comply with applicable rules, there is risk that the use of social media by us or our employees to communicate about our product

candidates or business may cause us to be found in violation of applicable requirements. In addition, our employees may knowingly or inadvertently make use of social media in ways that may not comply with applicable laws and regulations, our policies and other legal or contractual requirements, which may give rise to regulatory enforcement action, liability, lead to the loss of trade secrets or other intellectual property or result in public exposure of personal information of our employees, clinical trial patients, customers and others. Furthermore, negative posts or comments about us or our product candidates in social media could seriously damage our reputation, brand image and goodwill. Any of these events could have a material adverse effect on our business, prospects, operating results and financial condition and could adversely affect the price of our common stock.

Risks Related to Commercialization

Developments by competitors may render our products or technologies obsolete or non-competitive or may reduce the size of our markets.

Our industry has been characterized by extensive research and development efforts, rapid developments in technologies, intense competition and a strong emphasis on proprietary products. We expect our product candidates to face intense and increasing competition as new products enter the relevant markets and advanced technologies become available. We face potential competition from many different sources, including pharmaceutical, biotechnology and specialty pharmaceutical companies. Academic research institutions, governmental agencies and public and private institutions are also potential sources of competitive products and technologies. Our competitors may have or may develop superior technologies or approaches, which may provide them with competitive advantages. Many of these competitors may also have compounds already approved or in development in the therapeutic categories that we are targeting with our product candidates. In addition, many of these competitors, either alone or together with their collaborative partners, may operate larger research and development programs or have substantially greater financial resources than we do, as well as greater experience in:

- developing product candidates;
- undertaking preclinical testing and clinical trials;
- obtaining NDA approval by the FDA;
- comparable foreign regulatory approvals of product candidates;
- formulating and manufacturing products; and
- launching, marketing and selling products.

If these competitors access the marketplace before we do with safer, more effective, or less expensive therapeutics, our product candidates, if approved for commercialization, may not be profitable to sell or worthwhile to continue to develop. Technology in the pharmaceutical industry has undergone rapid and significant change, and we expect that it will continue to do so. Any compounds, products or processes that we develop may become obsolete or uneconomical before we recover any expenses incurred in connection with their development. The success of our product candidates will depend upon factors such as product efficacy, safety, reliability, availability, timing, scope of regulatory approval, acceptance and price, among other things. Other important factors to our success include speed in developing product candidates, completing clinical development and laboratory testing, obtaining regulatory approvals and manufacturing and selling commercial quantities of potential products.

Significant competition exists from approved treatments or treatments in development for the diseases that we are targeting. Many of the approved drugs are well-established therapies or products and are widely accepted by physicians, patients and third-party payors. There are pharmaceutical and biotechnology companies at various stages of development of treatments for COVID-19 (or vaccines for SARS-CoV-2), HCV, dengue and RSV.

There are several approved drugs for the treatment of HCV, an approved vaccine for dengue and an approved drug for the treatment of RSV. Our product candidates are intended to compete directly or indirectly with existing products and products currently in development. Even if approved and commercialized, our product candidates may fail to achieve market acceptance with hospitals, physicians or patients. Hospitals, physicians or patients may conclude that our products are less safe or effective or otherwise less attractive than existing drugs. If our product candidates do not receive market acceptance for any reason, our revenue potential would be diminished, which would materially adversely affect our ability to become profitable.

Many of our competitors have substantially greater capital resources, robust product candidate pipelines, established presence in the market and expertise in research and development, manufacturing, preclinical and clinical testing, obtaining regulatory approvals and reimbursement and marketing approved products than we do. As a result, our competitors may achieve product commercialization or patent or other intellectual property protection earlier than we can. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These competitors also compete with us in recruiting and retaining qualified clinical, regulatory, scientific, sales, marketing and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs. Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient, or are less expensive than any products that we may develop or that would render any products that we may develop obsolete or noncompetitive.

The successful commercialization of our product candidates will depend in part on the extent to which governmental authorities and health insurers establish coverage, adequate reimbursement levels and pricing policies. Failure to obtain or maintain coverage and adequate reimbursement for our product candidates, if approved, could limit our ability to market those products and decrease our ability to generate product revenue.

There is significant uncertainty related to the insurance coverage and reimbursement of newly approved products. In the United States, third-party payors, including private and governmental payors, such as the Medicare and Medicaid programs, play an important role in determining the extent to which new drugs and biologics will be covered. Our ability to successfully commercialize our product candidates will depend in part on the extent to which coverage and adequate reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers and other organizations. Government authorities and other third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and establish reimbursement levels. The availability of coverage and extent of reimbursement by governmental and private payors is essential for most patients to be able to afford treatments.

Third-party payors increasingly are challenging prices charged for pharmaceutical products and services, and many third-party payors may refuse to provide coverage and reimbursement for particular drugs and biologics when an equivalent generic drug, biosimilar or a less expensive therapy is available. It is possible that a third-party payor may consider our product candidates as substitutable and only offer to reimburse patients for the less expensive product. For products administered under the supervision of a physician, obtaining coverage and adequate reimbursement may be particularly difficult because of the higher prices often associated with such drugs. Even if we show improved efficacy or improved convenience of administration with our product candidates, pricing of existing third-party therapeutics may limit the amount we will be able to charge for our product candidates. These payors may deny or revoke the reimbursement status of a given product or establish prices for new or existing marketed products at levels that are too low to enable us to realize an appropriate return on our investment in our product candidates. If reimbursement is not available or is available only at

limited levels, we may not be able to successfully commercialize our product candidates and may not be able to obtain a satisfactory financial return on our product candidates.

In the United States, third-party payors, including private and governmental payors, such as the Medicare and Medicaid programs, play an important role in determining the extent to which new drugs and biologics will be covered and reimbursed. The Medicare program is increasingly used as a model for how private and other governmental payors develop their coverage and reimbursement policies for new drugs. However, no uniform policy for coverage and reimbursement for products exists among third-party payors in the United States. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of our product candidates to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. Some third-party payors may require pre-approval of coverage for new or innovative drug therapies before they will reimburse healthcare providers who use such therapies. Furthermore, rules and regulations regarding reimbursement change frequently, in some cases on short notice, and we believe that changes in these rules and regulations are likely. We cannot predict at this time what third-party payors will decide with respect to the coverage and reimbursement for our product candidates.

Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in the EU and other jurisdictions have and will continue to put pressure on the pricing and usage of our product candidates. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. Other countries allow companies to fix their own prices for medical products, but monitor and control company profits. Additional foreign price controls or other changes in pricing regulation could restrict the amount that we are able to charge for our product candidates. Accordingly, in markets outside the United States, the reimbursement for our product candidates may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenue and profits.

Moreover, increasing efforts by governmental and third-party payors in the United States and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for our product candidates. We expect to experience pricing pressures in connection with the sale of our product candidates due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and biologics and surgical procedures and other treatments, has become intense. As a result, increasingly high barriers are being erected to the entry of new products.

If we are unable to establish sales, marketing and distribution capabilities either on our own or in collaboration with third parties, we may not be successful in commercializing any of our product candidates, if approved, and we may not be able to generate any product revenue.

We have limited personnel or infrastructure for the sales, marketing or distribution of products, and no experience as a company in commercializing a product candidate. The cost of building and maintaining such an organization may exceed the cost-effectiveness of doing so.

We may build our own focused sales, distribution and marketing infrastructure to market our product candidates, if approved, in the United States and other markets around the world. There are significant expenses and risks involved with building our own sales, marketing and distribution capabilities, including our ability to hire, retain and appropriately incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel, and effectively manage a geographically dispersed sales

and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities could delay any product launch, which would adversely impact the commercialization of our product candidate, if approved. Additionally, if the commercial launch of our product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition our sales and marketing personnel.

Factors that may inhibit our efforts to commercialize our product candidates on our own include:

- our inability to recruit and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to physicians or persuade adequate numbers of physicians to prescribe our future products;
- our inability to equip medical and sales personnel with effective materials, including medical and sales literature to help them educate physicians and other healthcare providers regarding applicable diseases and our future products;
- the lack of complementary products to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines;
- our inability to develop or obtain sufficient operational functions to support our commercial activities; and
- unforeseen costs and expenses associated with creating an independent sales and marketing organization.

If we are unable or decide not to establish internal sales, marketing and distribution capabilities, or decide not to do so for a particular country, we may pursue collaborative arrangements. If we pursue a collaborative arrangement, our sales will largely depend on the collaborator's strategic interest in the product and such collaborator's ability to successfully market and sell the product.

If we are unable to build our own sales force or access a collaborative relationship for the commercialization of any of our product candidates, we may be forced to delay the potential commercialization of our product candidates or reduce the scope of our sales or marketing activities for such product candidates. If we elect to increase our expenditures to fund commercialization activities ourselves, we will need to obtain additional capital, which may not be available to us on acceptable terms, or at all. We could enter into arrangements with collaborative partners at an earlier stage than otherwise would be ideal and we may be required to relinquish rights to any of our product candidates or otherwise agree to terms unfavorable to us, any of which may have an adverse effect on our business, operating results and prospects.

If we are unable to establish adequate sales, marketing and distribution capabilities, either on our own or in collaboration with third parties, we will not be successful in commercializing our other product candidates and may not become profitable and may incur significant additional losses. We will be competing with many companies that currently have extensive and well-funded marketing and sales operations. Without an internal team or the support of a third party to perform marketing and sales functions, we may be unable to compete successfully against these more established companies.

In addition, even if we do establish adequate sales, marketing and distribution capabilities, the progress of general industry trends with respect to pricing models, supply chains and delivery mechanisms, among other things, could deviate from our expectations. If these or other industry trends change in a manner which we do not anticipate or for which we are not prepared, we may not be successful in commercializing our product candidates or become profitable.

Our future growth may depend, in part, on our ability to penetrate foreign markets, where we would be subject to additional regulatory burdens and other risks and uncertainties.

Our future profitability may depend, in part, on our ability to commercialize our product candidates in foreign markets for which we may rely on collaboration with third parties. We are evaluating the opportunities for the development and commercialization of our product candidates in foreign markets. We are not permitted to market or promote any of our product candidates before we receive regulatory approval from the applicable regulatory authority in that foreign market, and we may never receive such regulatory approval for any of our product candidates. To obtain separate regulatory approvals in other countries, we may be required to comply with numerous and varying regulatory requirements of such countries regarding the safety and efficacy of our product candidates and governing, among other things, clinical trials and commercial sales, pricing and distribution of our product candidates, and we cannot predict success in these jurisdictions. If we obtain approval of our product candidates and ultimately commercialize our product candidates in foreign markets, we would be subject to additional risks and uncertainties, including:

- our customers' ability to obtain reimbursement for our product candidates in foreign markets;
- our inability to directly control commercial activities if we are relying on third parties;
- the burden of complying with complex and changing foreign regulatory, tax, accounting and legal requirements;
- different medical practices and customs in foreign countries affecting acceptance in the marketplace;
- import or export licensing requirements;
- longer accounts receivable collection times;
- our ability to supply our product candidates on a timely and large-scale basis in local markets;
- longer lead times for shipping which may necessitate local manufacture of our product candidates;
- language barriers for technical training and the need for language translations;
- reduced protection of patent and other intellectual property rights in some foreign countries;
- the existence of additional potentially relevant third-party intellectual property rights;
- foreign currency exchange rate fluctuations; and
- the interpretation of contractual provisions governed by foreign laws in the event of a contract dispute.

Foreign sales of our product candidates could also be adversely affected by the imposition of governmental controls, political and economic instability, trade restrictions and changes in tariffs.

If any of our product candidates is approved for commercialization, we may selectively partner with third parties to market it in certain jurisdictions outside the United States. We expect that we will be subject to additional risks related to international pharmaceutical operations, including:

- different regulatory requirements for drug approvals and rules governing drug commercialization in foreign countries, including requirements specific to biologics or cell therapy products;
- reduced protection for patent and other intellectual property rights;
- foreign reimbursement, pricing and insurance regimes;

- potential noncompliance with the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act 2010 and similar anti-bribery and anticorruption laws in other jurisdictions; and
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad.

We have no prior experience in these areas. In addition, there are complex regulatory, tax, labor and other legal requirements imposed by both the EU and many of the individual countries in Europe with which we will need to comply. Many U.S.-based biotechnology companies have found the process of marketing their own products in Europe to be very challenging.

Certain legal and political risks are also inherent in foreign operations. There is a risk that foreign governments may nationalize private enterprises in certain countries where we may operate. In certain countries or regions, terrorist activities and the response to such activities may threaten our operations more than in the United States. Social and cultural norms in certain countries may not support compliance with our corporate policies, including those that require compliance with substantive laws and regulations. Also, changes in general economic and political conditions in countries where we may operate are a risk to our financial performance and future growth. Additionally, the need to identify financially and commercially strong partners for commercialization outside the United States who will comply with the high manufacturing and legal and regulatory compliance standards we require is a risk to our financial performance. As we operate our business globally, our success will depend, in part, on our ability to anticipate and effectively manage these and other related risks. There can be no assurance that the consequences of these and other factors relating to our international operations will not have an adverse effect on our business, financial condition or results of operations.

In some countries, particularly in Europe, the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a drug. To obtain reimbursement or pricing approval in some countries, we may be required to conduct clinical trials that compare the cost-effectiveness of our product candidates to other available therapies. If reimbursement of our products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business could be harmed, possibly materially.

Potential product liability lawsuits against us could cause us to incur substantial liabilities and limit commercialization of any products that we may develop.

The use of our product candidates in clinical trials and the sale of any products for which we obtain marketing approval exposes us to the risk of product liability claims. Product liability claims might be brought against us by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with our products. On occasion, large judgments have been awarded in class action lawsuits based on products that had unanticipated adverse effects. If we cannot successfully defend against product liability claims, we could incur substantial liability and costs, which may not be covered by insurance. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- impairment of our business reputation and significant negative media attention;
- withdrawal of participants from our clinical trials;
- injury to our reputation;
- initiation of investigations by regulators;
- significant costs to defend the related litigation and related litigation;

- distraction of management's attention from our primary business;
- substantial monetary awards to patients or other claimants;
- inability to commercialize a product candidate;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- exhaustion of any available insurance and our capital resources, and the inability to commercialize any product candidate;
- decreased demand for a product candidate, if approved for commercial sale; and
- loss of revenue.

Failure to obtain or retain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of products we develop, alone or with corporate collaborators. Although we have clinical trial insurance, our insurance policies also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts. Even if our agreements with any future corporate collaborators entitle us to indemnification against losses, such indemnification may not be available or adequate should any claim arise.

Risks Related to our Dependence on Third Parties and Manufacturing

We will rely on third parties for the manufacture of raw materials for our research programs, preclinical studies and clinical trials and we do not have long-term contracts with many of these parties. This reliance on third parties increases the risk that we will not have sufficient quantities of such materials, product candidates, or any therapies that we may develop and commercialize, or that such supply will not be available to us at an acceptable cost, which could delay, prevent, or impair our development or commercialization efforts.

We expect to rely on third parties for the manufacture of raw materials for our clinical trials and preclinical and clinical development. We expect to rely on third parties for commercial manufacture if any of our product candidates receive marketing approval, including Roche with respect to AT-527. We do not have a long-term agreement with any of the third-party manufacturers we currently use to provide preclinical and clinical raw materials, and we purchase any required materials on a purchase order basis. Certain of these manufacturers are critical to our production and the loss of these manufacturers to one of our competitors or otherwise, or an inability to obtain quantities at an acceptable cost or quality, could delay, prevent or impair our ability to timely conduct preclinical studies or clinical trials, and would materially and adversely affect our development and commercialization efforts.

We expect to continue to rely on third-party manufacturers for the commercial supply of any of our product candidates for which we obtain marketing approval, if any. We may be unable to maintain or establish required agreements with third-party manufacturers or to do so on acceptable terms. Even if we are able to establish agreements with third-party manufacturers, reliance on third-party manufacturers entails additional risks, including:

- the failure of the third party to manufacture our product candidates according to our schedule, or at all, including if our third-party contractors give greater priority to the supply of other products over our product candidates or otherwise do not satisfactorily perform according to the terms of the agreements between us and them;
- the reduction or termination of production or deliveries by suppliers, or the raising of prices or renegotiation of terms;

- the termination or nonrenewal of arrangements or agreements by our third-party contractors at a time that is costly or inconvenient for us;
- the breach by the third-party contractors of our agreements with them;
- the failure of third-party contractors to comply with applicable regulatory requirements;
- the failure of the third party to manufacture our product candidates according to our specifications;
- the mislabeling of clinical supplies, potentially resulting in the wrong dose amounts being supplied or active drug or placebo not being properly identified;
- clinical supplies not being delivered to clinical sites on time, leading to clinical trial interruptions, or of drug supplies not being distributed to commercial vendors in a timely manner, resulting in lost sales; and
- the misappropriation or unauthorized disclosure of our intellectual property or other proprietary information, including our trade secrets and know-how.

We do not have complete control over all aspects of the manufacturing process of, and are dependent on, our contract manufacturing partners for compliance with cGMP regulations for manufacturing both active drug substances and finished drug products. Third-party manufacturers may not be able to comply with cGMP regulations or similar regulatory requirements outside of the United States. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or others, they will not be able to secure and/or maintain authorization for their manufacturing facilities. In addition, we do not have control over the ability of our contract manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority does not authorize these facilities for the manufacture of our product candidates or if it withdraws any such authorization in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain marketing approval for or market our product candidates, if approved. Our failure, or the failure of our third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of product candidates or drugs, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our product candidates or drugs and harm our business and results of operations.

Our third-party manufacturers may be unable to successfully scale up manufacturing of our product candidates in sufficient quality and quantity, which may impair the clinical advancement and commercialization of our product candidates.

In order to conduct clinical trials of our product candidates and commercialize any approved product candidates, our manufacturing partners need to manufacture them in large quantities. However, they may be unable to successfully increase the manufacturing capacity for any of our product candidates in a timely or cost-effective manner, or at all. In addition, quality issues may arise during scale-up activities, as discussed above. If we, or any manufacturing partners, are unable to successfully scale up the manufacture of our product candidates in sufficient quality and quantity, the development, testing and clinical trials of these product candidates may be delayed or infeasible, and regulatory approval or commercial launch of any resulting products may be delayed or not obtained, which could significantly harm our business. Supply sources could be interrupted from time to time and, if interrupted, it is not certain that supplies could be resumed (whether in part or in whole) within a reasonable timeframe and at an acceptable cost, or at all. If we are unable to obtain or maintain third-party manufacturing for commercial supply of our product candidates, or to do so on commercially reasonable terms, we may not be able to develop and commercialize our product candidates successfully.

We do not have multiple sources of supply for some of the components used in our product candidates, nor long-term supply contracts, and certain of our suppliers are critical to our production. If we were to lose a critical supplier, it could have a material adverse effect on our ability to complete the development of our product candidates. If we obtain regulatory approval for any of our product candidates, we would need to expand the supply of their components in order to commercialize them.

We do not have multiple sources of supply for each of the components used in the manufacturing of AT-527, AT-752, AT-787 or any of our other product candidates. We have a sole supplier located in China for our active pharmaceutical ingredients. For fill-finish work, we have a supplier located in Canada and a back-up supplier located in the United States. We do not have long-term supply agreements with all of our component suppliers. We may not be able to establish additional sources of supply for our product candidates, or may be unable to do so on acceptable terms. Manufacturing suppliers are subject to cGMP quality and regulatory requirements, covering manufacturing, testing, quality control and record keeping relating to our product candidates and subject to ongoing inspections by applicable regulatory authorities. Manufacturing suppliers are also subject to local, state and federal regulations and licensing requirements. Failure by any of our suppliers to comply with all applicable regulations and requirements may result in long delays and interruptions in supply.

The number of suppliers of the raw material components of our product candidates is limited. In the event it is necessary or desirable to acquire supplies from alternative suppliers, we might not be able to obtain them on commercially reasonable terms, if at all. It could also require significant time and expense to redesign our manufacturing processes to work with another company and redesign of processes can trigger the need for conducting additional studies such as comparability or bridging studies. Additionally, certain of our suppliers are critical to our production, and the loss of these suppliers to one of our competitors or otherwise would materially and adversely affect our development and commercialization efforts.

As part of any marketing approval, regulatory authorities conduct inspections that must be successful prior to the approval of the product. Failure of manufacturing suppliers to successfully complete these regulatory inspections will result in delays. If supply from the approved supplier is interrupted, there could be a significant disruption in commercial supply. An alternative vendor would need to be qualified through a NDA amendment or supplement, which could result in further delay. The FDA or other regulatory authorities outside of the United States may also require additional studies if a new supplier is relied upon for commercial production. Switching vendors may involve substantial costs and is likely to result in a delay in our desired clinical and commercial timelines.

If we are unable to obtain the supplies we need at a reasonable price or on a timely basis, it could have a material adverse effect on our ability to complete the development of our product candidates or, if we obtain regulatory approval for our product candidates, to commercialize them.

We rely on third parties to conduct our preclinical studies and clinical trials. Any failure by a third party to conduct the clinical trials according to GCPs and in a timely manner may delay or prevent our ability to seek or obtain regulatory approval for or commercialize our product candidates.

We are dependent on third parties to conduct critical aspects of our preclinical studies and clinical trials, including our ongoing Phase 2 clinical trial for AT-527 for the treatment of COVID-19, our Phase 1/2A clinical trial of AT-787 for the treatment of HCV and our IND-enabling studies for AT-752, and we expect to rely on third parties to conduct future clinical trials and preclinical studies for our product candidates. Specifically, we have used and relied on, and intend to continue to use and rely on, medical institutions, clinical investigators, CROs and consultants to conduct our clinical trials in accordance with our clinical protocols and regulatory requirements. These CROs, investigators and other third parties play a significant role in the conduct and timing of these trials and subsequent collection and analysis of data. While we have agreements governing the

activities of our third-party contractors, we have limited influence over their actual performance. Nevertheless, we are responsible for ensuring that each of our clinical trials is conducted in accordance with the applicable protocol and legal, regulatory and scientific standards, and our reliance on the CROs and other third parties does not relieve us of our regulatory responsibilities. We and our CROs are required to comply with GCP requirements, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for all of our product candidates in clinical development. Regulatory authorities enforce these GCPs through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any of our CROs or trial sites fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable, and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials or research activities complies with GCP regulations. In addition, our clinical trials must be conducted with product produced under cGMP regulations. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process.

Any third parties conducting our clinical trials or preclinical studies are not and will not be our employees and, except for remedies available to us under our agreements with such third parties, we cannot guarantee that any such CROs, investigators or other third parties will devote adequate time and resources to such trials or perform as contractually required. If any of these third parties fail to meet expected deadlines, adhere to our clinical protocols or meet regulatory requirements, or otherwise performs in a substandard manner, our clinical trials may be extended, delayed or terminated. In addition, many of the third parties with whom we contract may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials or other drug development activities that could harm our competitive position. In addition, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and may receive cash and cash equivalents or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or the FDA concludes that the financial relationship may have affected the interpretation of the trial, the integrity of the data generated at the applicable clinical trial site may be questioned, and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection of any NDA we submit to the FDA. Any such delay or rejection could prevent us from commercializing our product candidates.

Our CROs have the right to terminate their agreements with us in the event of an uncured material breach. In addition, some of our CROs and substantially all our clinical trial sites have an ability to terminate their respective agreements with us if it can be reasonably demonstrated that the safety of the subjects participating in our clinical trials warrants such termination.

If any of our relationships with these third parties terminate, we may not be able to enter into arrangements with alternative third parties or do so on commercially reasonable terms. Switching or adding additional CROs, investigators and other third parties involves additional cost and requires management time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays occur, which could materially impact our ability to meet our desired clinical development timelines. Though we carefully manage our relationships with our CROs, investigators and other third parties, there can be no assurance that we will not encounter challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects.

We may collaborate with third parties for the development and commercialization of our candidates. We may not succeed in establishing and maintaining collaborative relationships, which may significantly limit our ability to develop and commercialize our product candidates successfully, if at all.

In October 2020 we entered into the Roche License Agreement under which we granted an exclusive license for certain development and commercialization rights related to AT-527 outside of the United States to Roche. As part of the Roche License Agreement we agreed with Roche that we would not commercialize AT-752 outside the United States unless we entered into a separate agreement with Roche to do so. We may seek additional collaborative relationships for the development and commercialization of our product candidates. If we enter into any additional such arrangements with any third parties, we will likely have shared or limited control over the amount and timing of resources that our collaborators dedicate to the development or potential commercialization of any product candidates we may seek to develop with them. Our ability to generate product revenue from these arrangements with commercial entities will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements. We cannot predict the success of any collaboration that we enter into. Collaborations involving our product candidates pose the following risks to us:

- collaborators generally have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not properly obtain, maintain, enforce or defend intellectual property or proprietary rights relating to our product candidates or may use our proprietary information inappropriately or in such a way as to expose us to potential litigation or other intellectual property-related proceedings, including proceedings challenging the scope, ownership, validity and enforceability of our intellectual property;
- collaborators may own or co-own intellectual property rights covering our product candidates that result from our collaboration with them, and in such cases, we may not have the exclusive right to commercialize such intellectual property or such product candidates;
- disputes may arise with respect to the ownership of intellectual property developed pursuant to collaborations;
- we may need the cooperation of our collaborators to enforce or defend any intellectual property we contribute to or that arises out of our collaborations, which may not be provided to us;
- collaborators may infringe, misappropriate or otherwise violate the intellectual property rights of third parties, which may expose us to litigation and potential liability;
- disputes may arise between the collaborators and us that result in the delay or termination of the research, development or commercialization of our product candidates or that result in costly litigation or arbitration that diverts management attention and resources;
- collaborators may decide not to pursue development and commercialization of any product candidates we develop or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborator's strategic focus or available funding or external factors, such as an acquisition that diverts resources or creates competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials, or require a new formulation of a product candidate for clinical testing;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;
- collaborators with marketing and distribution rights to one or more product candidates may not commit sufficient resources to the marketing and distribution of such product candidates;

- we may lose certain valuable rights under circumstances identified in our collaborations, including if we undergo a change of control;
- collaborators may undergo a change of control and the new owners may decide to take the collaboration in a direction which is not in our best interest;
- collaborators may become party to a business combination transaction and the continued pursuit and emphasis on our development or commercialization program by the resulting entity under our existing collaboration could be delayed, diminished or terminated;
- collaborators may become bankrupt, which may significantly delay our research or development programs, or may cause us to lose access to valuable technology, devices, materials, know-how or intellectual property of the collaborator relating to our product candidates;
- key personnel at our collaborators may leave, which could negatively impact our ability to productively work with our collaborators;
- collaborations may require us to incur short- and long-term expenditures, issue securities that dilute our stockholders, or disrupt our management and business;
- collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates; and
- collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all.

We may face significant competition in seeking appropriate collaborations. Business combinations among biotechnology and pharmaceutical companies have resulted in a reduced number of potential collaborators. In addition, the negotiation process is time-consuming and complex, and we may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of the product candidate for which we are seeking to collaborate or delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop product candidates or bring them to market and generate product revenue.

If we enter into collaborations to develop and potentially commercialize any product candidates, we may not be able to realize the benefit of such transactions if we or our collaborator elect not to exercise the rights granted under the agreement or if we or our collaborator are unable to successfully integrate a product candidate into existing operations and company culture. In addition, if our agreement with any of our collaborators terminates, our access to technology and intellectual property licensed to us by that collaborator may be restricted or terminate entirely, which may delay our continued development of our product candidates utilizing the collaborator’s technology or intellectual property or require us to stop development of those product candidates completely. We may also find it more difficult to find a suitable replacement collaborator or attract new collaborators, and our development programs may be delayed or the perception of us in the business and financial communities could be adversely affected. Any collaborator may also be subject to many of the risks relating to product development, regulatory approval, and commercialization described in this “Risk Factors” section, and any negative impact on our collaborators may adversely affect us.

If we seek, but are not able to establish, collaborations, we may have to alter our development and commercialization plans.

Our product development programs and the potential commercialization of our product candidates will require substantial additional capital. We may decide to collaborate with pharmaceutical and biotechnology companies for the development and potential commercialization of our product candidates.

We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or comparable regulatory authorities outside the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge and industry and market conditions generally. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us for our product candidate. Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

We may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of such product candidate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop our product candidates or bring them to market and generate product revenue.

We may enter into collaborations, licensing arrangements, joint ventures, strategic alliances or partnerships with third parties that may not result in the development of commercially viable products or the generation of significant future product revenues.

In the ordinary course of our business, we may enter into collaborations, licensing arrangements, joint ventures, strategic alliances, partnerships or other arrangements to develop new products and to pursue new markets. Proposing, negotiating and implementing collaborations, licensing arrangements, joint ventures, strategic alliances or partnerships may be a lengthy and complex process. Other companies, including those with substantially greater financial, marketing, sales, technology or other business resources, may compete with us for these opportunities or arrangements. We may not identify, secure, or complete any such transactions or arrangements in a timely manner, on a cost-effective basis, on acceptable terms or at all. We have limited institutional knowledge and experience with respect to these business development activities, and we may also not realize the anticipated benefits of any such transaction or arrangement. In particular, these collaborations may not result in the development of products that achieve commercial success or result in significant product revenues and could be terminated prior to developing any products.

Additionally, we may not be in a position to exercise sole decision making authority regarding the transaction or arrangement, which could create the potential risk of creating impasses on decisions, and our future

collaborators may have economic or business interests or goals that are, or that may become, inconsistent with our business interests or goals. It is possible that conflicts may arise with our collaborators, such as conflicts concerning the achievement of performance milestones, or the interpretation of significant terms under any agreement, such as those related to financial obligations or the ownership or control of intellectual property developed during the collaboration. If any conflicts arise with any current or future collaborators, they may act in their self-interest, which may be adverse to our best interest, and they may breach their obligations to us. In addition, we may have limited control over the amount and timing of resources that any current or future collaborators devote to our or their future products. Disputes between us and our collaborators may result in litigation or arbitration, which would increase our expenses and divert the attention of our management. Further, these transactions and arrangements will be contractual in nature and will generally be terminable under the terms of the applicable agreements and, in such event, we may not continue to have rights to the products relating to such transaction or arrangement or may need to purchase such rights at a premium.

If we enter into in-bound intellectual property license agreements, we may not be able to fully protect the licensed intellectual property rights or maintain those licenses. Future licensors could retain the right to prosecute, maintain, defend and enforce the intellectual property rights licensed to us, in which case we would depend on the ability and will of our licensors to do so. These licensors may determine not to pursue litigation against other companies or may pursue such litigation less aggressively than we would. If our licensors do not adequately protect or enforce such licensed intellectual property, competitors may be able to use such intellectual property and erode or negate any competitive advantage we may have, which could materially harm our business, negatively affect our position in the marketplace, limit our ability to commercialize our products and product candidates and delay or render impossible our achievement of profitability. Further, entering into such license agreements could impose various diligence, commercialization, payment or other obligations on us, and future licensors may allege that we have breached our license agreement with them and accordingly seek to terminate our license. Any of the foregoing could adversely affect our competitive business position and have a material adverse effect on our business, financial condition, results of operations, and prospects.

Data provided by collaborators and others upon which we rely that have not been independently verified could turn out to be false, misleading or incomplete.

We rely on third-party vendors, such as CROs, scientists and collaborators to provide us with significant data and other information related to our projects, preclinical studies or clinical trials and our business. If such third parties provide inaccurate, misleading or incomplete data, our business, prospects and results of operations could be materially adversely affected.

Our employees and independent contractors, including principal investigators, CROs, consultants, vendors and any third parties we may engage in connection with research, development, regulatory, manufacturing, quality assurance and other pharmaceutical functions and commercialization may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements, which could have a material adverse effect on our business.

Misconduct by our employees and independent contractors, including principal investigators, CROs, consultants, vendors and any third parties we may engage in connection with research, development, regulatory, manufacturing, quality assurance and other pharmaceutical functions and commercialization, could include intentional, reckless or negligent conduct or unauthorized activities that violate: (i) the laws and regulations of the FDA, and other similar regulatory authorities, including those laws that require the reporting of true, complete and accurate information to such authorities; (ii) manufacturing standards; (iii) data privacy, security, fraud and abuse and other healthcare laws and regulations; or (iv) laws that require the reporting of true, complete and accurate financial information and data. Specifically, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent

fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Activities subject to these laws could also involve the improper use or misrepresentation of information obtained in the course of preclinical studies or clinical trials, creation of fraudulent data in preclinical studies or clinical trials or illegal misappropriation of drug product, which could result in regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with such laws or regulations. Additionally, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and results of operations, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgements, possible exclusion from participation in Medicare, Medicaid, other U.S. federal healthcare programs or healthcare programs in other jurisdictions, integrity oversight and reporting obligations to resolve allegations of non-compliance, individual imprisonment, other sanctions, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of our operations.

If our CMOs use hazardous and biological materials in a manner that causes injury or violates applicable law, we may be liable for damages.

Our research and development activities involve the controlled use of potentially hazardous substances, including chemical and biological materials, by our manufacturers. Our manufacturers are subject to federal, state and local laws and regulations in the United States and in the countries in which they operate governing the use, manufacture, storage, handling and disposal of medical and hazardous materials. Although we believe that our manufacturers' procedures for using, handling, storing and disposing of these materials comply with legally prescribed standards, we cannot completely eliminate the risk of contamination or injury resulting from medical or hazardous materials. As a result of any such contamination or injury, we may incur liability or local, city, state or federal authorities may curtail the use of these materials and interrupt our business operations. In the event of an accident, we could be held liable for damages or penalized with fines, and the liability could exceed our resources. Generally, we do not have any insurance for liabilities arising from medical or hazardous materials. Compliance with applicable environmental laws and regulations is expensive, and current or future environmental regulations may impair our research, development and production efforts, which could harm our business, prospects, financial condition or results of operations.

Risks Related to Intellectual Property

If we are unable to obtain, maintain, enforce and adequately protect our intellectual property rights with respect to our technology and product candidates, or if the scope of the patent or other intellectual property protection obtained is not sufficiently broad, our competitors could develop and commercialize technology and products similar or identical to ours, and our ability to successfully develop and commercialize our technology and product candidates may be adversely affected.

We rely upon a combination of patents, trade secret protection and confidentiality agreements to protect our intellectual property and prevent others from duplicating AT-511, AT-527, AT-281, AT-752, AT-777, and AT-787, or their use or manufacture, or any of our other pipeline product candidates and any future product candidates, and our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to such product candidates.

The patent prosecution process is expensive, time-consuming, and complex, and we may not be able to file, prosecute, maintain, enforce, or license all necessary or desirable patent applications at a reasonable cost or in a timely manner. Although we enter into confidentiality agreements with parties who have access to confidential or patentable aspects of our research and development output, such as our employees, CROs, consultants, scientific advisors and other contractors, any of these parties may breach the agreements and disclose such output before a patent application is filed, thereby jeopardizing our ability to seek patent protection. In addition, publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, and some remain so until issued. Therefore, we cannot be certain that we were the first to make the inventions claimed in our patents or pending patent applications, or that we were the first to file any patent application related to an invention or product candidate. Further, if we encounter delays in regulatory approvals, the period of time during which we could market a product candidate under patent protection could be reduced.

The strength of patents in the pharmaceutical field involves complex legal, factual and scientific questions and can be uncertain. It is possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. The patent applications that we own may fail to result in issued patents with claims that cover our product candidates in the United States or in other foreign countries. There is no assurance that all of the potentially relevant prior art relating to our patents and patent applications has been found, which can invalidate a patent or prevent a patent from issuing from a pending patent application. Even if patents do successfully issue and even if such patents cover our product candidates, third parties may challenge the inventorship, ownership, validity, enforceability or scope of such patents, which may result in such patents being narrowed or invalidated, or being held unenforceable. Our pending and future patent applications may not result in patents being issued which protect our technology or product candidates or which effectively prevent others from commercializing competitive technologies and product candidates. Additionally, any U.S. provisional patent application that we file is not eligible to become an issued patent until, among other things, we file a non-provisional patent application within 12 months of filing the related provisional patent application. If we do not timely file any non-provisional patent application, we may lose our priority date with respect to the provisional patent application and any patent protection on the inventions disclosed in the provisional patent application.

Furthermore, even if they are unchallenged, our patents and patent applications may not adequately protect our intellectual property, provide exclusivity for our product candidates or prevent others from designing around our claims. In addition, no assurances can be given that third parties will not create similar or alternative products or methods that achieve similar results without infringing upon our patents. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business.

If the patent applications we hold with respect to our programs or product candidates fail to issue, if the breadth or strength of protection of our current or future issued patents is threatened, or if they fail to provide meaningful exclusivity for our product candidates, it could dissuade companies from collaborating with us to develop product candidates, or threaten our ability to commercialize our current or future product candidates. Several patent applications covering our product candidates have been filed recently by us. We cannot offer any assurances about which, if any, will result in issued patents, the breadth of any such patents or whether any issued patents will be found invalid or unenforceable or will be threatened by third parties. Any successful opposition to these patents or any other patents owned by us could deprive us of rights necessary for the successful commercialization of any product candidates that we may develop.

The issuance of a patent is not conclusive as to its inventorship, ownership, scope, validity or enforceability, and our patents may be challenged in courts or patent offices in the United States and abroad. In addition, the

issuance of a patent does not give us the right to practice the patented invention, as third parties may have blocking patents that could prevent us from marketing our product candidate, if approved, or practicing our own patented technology.

Wide-ranging patent reform legislation in the United States, including the Leahy-Smith America Invents Act of 2011, or the Leahy-Smith Act, may increase the uncertainty of the strength or enforceability of our intellectual property and the cost to defend it. The Leahy-Smith Act includes a number of significant changes to U.S. patent law, including provisions that affect the way patent applications are prosecuted and also affect patent litigation. Under the Leahy-Smith Act, the United States transitioned from a “first-to-invent” to a “first-to-file” system for deciding which party should be granted a patent when two or more patent applications are filed by different parties claiming the same invention. This will require us to be prompt going forward during the time from invention to filing of a patent application and to be diligent in filing patent applications, but circumstances could prevent us from promptly filing or prosecuting patent applications on our inventions. The Leahy-Smith Act also enlarged the scope of disclosures that qualify as prior art. Furthermore, if a third party filed a patent application before effectiveness of applicable provisions of the Leahy-Smith Act, on March 16, 2013, an interference proceeding in the United States can be initiated by a third party to determine if it was the first to invent any of the subject matter covered by the claims of our patent applications. We may also be subject to a third party preissuance submission of prior art to the U.S. Patent and Trademark Office, or USPTO.

The Leahy-Smith Act created for the first time new procedures to challenge issued patents in the United States, including post-grant review, *inter partes* review and derivation proceedings, which are adversarial proceedings conducted at the USPTO, which some third parties have been using to cause the cancellation of selected or all claims of issued patents of competitors. For a patent with a priority date of March 16, 2013 or later, which all of our patent filings have, a petition for post-grant review can be filed by a third party in a nine-month window from issuance of the patent. A petition for *inter partes* review can be filed immediately following the issuance of a patent if the patent was filed prior to March 16, 2013. A petition for *inter partes* review can be filed after the nine-month period for filing a post-grant review petition has expired for a patent with a priority date of March 16, 2013 or later. Post-grant review proceedings can be brought on any ground of challenge, whereas *inter partes* review proceedings can only be brought to raise a challenge based on published prior art. These adversarial actions at the USPTO include review of patent claims without the presumption of validity afforded to U.S. patents in lawsuits in U.S. federal courts. The USPTO issued a final rule effective November 13, 2018 announcing that it will now use the same claim construction standard currently used in the U.S. federal courts to interpret patent claims in USPTO proceedings, which is the plain and ordinary meaning of words used. If any of our patents are challenged by a third party in such a USPTO proceeding, there is no guarantee that we will be successful in defending the patent, which would result in a loss of the challenged patent right to us, including loss of exclusivity, or in patent claims being narrowed, invalidated, or held unenforceable, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and product candidates. Such proceedings also may result in substantial cost and require significant time from our scientists and management, even if the eventual outcome is favorable to us.

As a result of all of the foregoing, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain, which could have a material adverse effect on our business, financial condition, results of operations, and prospects.

Third-party claims of intellectual property infringement, misappropriation or other violation may result in substantial costs or prevent or delay our development and commercialization efforts.

Our commercial success depends in part on our avoiding actual and allegations of infringement, misappropriation or other violation of the patents and other proprietary rights of third parties. There is a

substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the pharmaceutical industry, including patent infringement lawsuits, interferences, oppositions, re-examination, and post-grant and *inter partes* review proceedings before the USPTO and similar proceedings in foreign jurisdictions, such as oppositions before the European Patent Office, or EPO. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are pursuing development candidates. Many companies in intellectual property-dependent industries, including the pharmaceutical industry, have employed intellectual property litigation as a means to gain an advantage over their competitors. As the pharmaceutical industry expands and more patents are issued, and as we gain greater visibility and market exposure as a public company, the risk increases that our product candidates may be subject to claims of infringement of the patent rights of third parties. Some claimants may have substantially greater resources than we do and may be able to sustain the costs of complex intellectual property litigation to a greater degree and for longer periods of time than we could. In addition, patent holding companies that focus solely on extracting royalties and settlements by enforcing patent rights may target us.

Third parties may assert that we are employing their proprietary technology without authorization. There may be third-party patents or patent applications with claims to composition of matter, drug delivery, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates. We cannot guarantee that our technologies, products, compositions and their uses do not or will not infringe, misappropriate or otherwise violate third-party patent or other intellectual property rights. Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our product candidates may infringe. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. Pending patent applications that have been published can, subject to certain limitations, be later amended in a manner that could cover our product candidates or the use of our product candidates. After issuance, the scope of patent claims remains subject to construction as determined by an interpretation of the law, the written disclosure in a patent and the patent's prosecution history. Our interpretation of the relevance or the scope of a patent or a pending application may be incorrect, which may negatively impact our ability to market our product candidates. In order to successfully challenge the validity of a U.S. patent in federal court, we would need to overcome a presumption of validity. As this burden is a high one requiring us to present clear and convincing evidence as to the invalidity of any such U.S. patent claim, there is no assurance that a court of competent jurisdiction would invalidate the claims of any such U.S. patent. If any third-party patents were held by a court of competent jurisdiction to cover the composition of matter of any of our product candidates, the manufacturing process of any of our product candidates or the method of use for any of our product candidates, the holders of any such patents may be able to block our ability to commercialize such product candidate unless we obtained a license under the applicable patents, which may not be available at all or on commercially reasonable terms, or until such patents expire.

The legal threshold for initiating litigation or contested proceedings is low, so that even lawsuits or proceedings with a low probability of success might be initiated and require significant resources to defend. Litigation and contested proceedings can also be expensive and time-consuming, and our adversaries in these proceedings may have the ability to dedicate greater resources to prosecuting these legal actions than we can. The risks of being involved in such litigation and proceedings may increase if and as our product candidates near commercialization and as we gain the greater visibility associated with being a public company. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future, regardless of the merit of such claims. We may not be aware of all intellectual property rights potentially relating to our technology and product candidates and their uses, or we may incorrectly conclude that third-party intellectual property is invalid or that our activities and product candidates do not infringe, misappropriate or otherwise violate such intellectual property. Thus, we do not know with certainty that our

technology and product candidates, or our development and commercialization thereof, do not and will not infringe, misappropriate or otherwise violate any third party's intellectual property.

Parties making claims against us may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize one or more of our product candidates and/or harm our reputation and financial results. Defense of these claims, regardless of their merit, could involve substantial litigation expense and could be a substantial diversion of management and employee resources from our business. In addition, there could be public announcements of the results of hearings, motions, or other interim proceedings or developments, and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, pay royalties, redesign our infringing products, in the case of claims concerning registered trademarks, rename our product candidates, or obtain one or more licenses from third parties, which may require substantial time and monetary expenditure, and which might be impossible or technically infeasible. Furthermore, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors and other third parties access to the same technologies licensed to us; alternatively or additionally it could include terms that impede or destroy our ability to compete successfully in the commercial marketplace. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations, and prospects.

A number of companies and universities file and obtain patents in the same area as our products, which are nucleotide prodrugs, and these patent filings could be asserted against us, which may affect our business, and if successful, could lead to expensive litigation, affect the profitability of our products and/or prohibit the sale of a product or its use.

Our product candidates are nucleotide prodrugs, or nucleotide phosphoramidates. A number of companies and universities have patent applications and issued patents in this general area, including for viral indications, such as, for example, Gilead Pharmasset, LLC.; Gilead Sciences, Inc.; Merck & Co.; Bristol Myers Squibb; Hoffman-La Roche; University of Cardiff; University College Cardiff Consultants; NuCana, plc; Alios Biopharma; Medivir; and others. If any of these companies or universities, or others, assert that a patent it holds is infringed by any of our product candidates or their use or manufacture, we may be drawn into expensive litigation, which may affect our business, take the time of and distract the attention of our employees, and if the litigation is successful, could affect the profitability of our products or prohibit their sale. On June 3, 2019, we received an anonymous Third Party Observation filed in connection with our international Patent Cooperation Treaty patent application for our second patent family, which covers the hemisulfate salt form of AT-511, or AT-527. The Observation generally challenges the patentability of the hemisulfate salt AT-527 over the free base AT-511. On August 1, 2019, we filed a response to the Observation describing that the AT-527 hemisulfate salt of AT-511 is not obvious in view of the AT-511 free base because AT-527 disproportionately concentrates in the liver over the heart, as shown in vivo in a dog model, which can provide an increased therapeutic effect to treat HCV, and decreased toxicity because hepatitis C is a disease of the liver. Further, while not raised in the response to the Observation, we have now also shown that AT-527 has a longer half-life and higher concentration in the lung than in the liver in vivo in monkeys, which is relevant to our COVID19 indication. On August 10, 2020, an anonymous party filed a Third Party Observation against our Patent Cooperation Treaty patent application covering a method to treat HCV patients with compensated or decompensated cirrhosis using our drug AT-527. The anonymous party asserted that it would have been obvious that the hemisulfate salt of AT-511 (AT-527) would be effective to treat HCV-infected cirrhotic patients. We disagree for several reasons, including that the hemisulfate salt of AT-511 had not been publicly disclosed at the time of the filing of our method of treatment of cirrhosis application and second it is well known that treating HCV-infected cirrhotic patients is very difficult. Our Patent Cooperation Treaty patent application provides human data that supports the efficacy of using

AT-527 to treat cirrhotic HCV-infected patients. The Third Party Observations are not acted on by the Patent Cooperation Treaty, which does not examine patent applications. The Observations by anonymous third parties as well as our responses are placed in the file and available to be read and considered by any country examining our respective patent applications. In December 2019, the U.S. Patent Office issued a patent to us covering the composition of matter AT-527. However, other than the foregoing issued U.S. patent, there can be no assurance that the Observations will not adversely affect our ability to obtain issued patents from national-stage filings of such Patent Cooperation Treaty patent applications in any jurisdictions. We may not be aware of patent claims that are currently or may in the future be pending that affect our business by the competitors working in this area. Patent applications are typically published between six and eighteen months from filing, and the presentation of new claims in already pending applications can sometimes not be visible to the public, including to us, for a period of time, or if publicly available, not yet seen by us. We cannot provide any assurance that a third party practicing in the general area of our technology will not present a patent claim that covers one or more of our products or their methods of use or manufacture at any time, including before or during this registration period. If that does occur, we may have to take steps to try to invalidate such patent or application, and we may either choose not to or may not be successful in such attempt. A license to the patent or application may not be available on commercially reasonable terms or at all.

Our products are subject to The Drug Price Competition and Patent Term Restoration Act of 1984, as amended (also referred to as the Hatch-Waxman Act), in the United States, that can increase the risk of litigation with generic companies trying to sell our products, and may cause us to lose patent protection.

Because our clinical candidates are pharmaceutical molecules reviewed by the Center for Drug Evaluation and Research of the FDA, after commercialization they will be subject in the United States to the patent litigation process of the Hatch-Waxman Act, as currently amended, which allows a generic company to submit an Abbreviated New Drug Application, or ANDA, to the FDA to obtain approval to sell our drug using bioequivalence data only. Under the Hatch-Waxman Act, we will have the opportunity to list our patents that cover our drug product or its method of use in the FDA's compendium of "Approved Drug Products with Therapeutic Equivalence Evaluation," sometimes referred to as the FDA's Orange Book.

Currently, in the United States, the FDA may grant five years of exclusivity for new chemical entities, or NCEs, for which all of our products may qualify. An NCE is a drug that contains no active moiety that has been approved by the FDA in any other New Drug Application, or NDA. A generic company can submit an ANDA to the FDA four years after approval of our product. The submission of the ANDA by a generic company is considered a technical act of patent infringement. The generic company can certify that it will wait until the natural expiration date of our listed patents to sell a generic version of our product or can certify that one or more of our listed patents are invalid, unenforceable or not infringed. If the latter, we will have 45 days to bring a patent infringement lawsuit against the generic company. This will initiate a challenge to one or more of our Orange Book-listed patents based on arguments from the generic company that our listed patents are invalid, unenforceable or not infringed. Under the Hatch-Waxman Act, if a lawsuit is brought, the FDA is prevented from issuing a final approval on the generic drug until 30 months after the end of our data exclusivity period, or a final decision of a court holding that our asserted patent claims are invalid, unenforceable or not infringed. If we do not properly list our relevant patents in the Orange Book, do not timely file a lawsuit in response to a certification from a generic company under an ANDA, or if we do not prevail in the resulting patent litigation, we can lose our proprietary protection, and our product can rapidly become generic. Further, even if we do correctly list our relevant patents in the Orange Book, bring a lawsuit in a timely manner and prevail in that lawsuit, the generic litigation may be at a very significant cost to us of attorneys' fees and employee time and distraction over a long period. Further, it is common for more than one generic company to try to sell an innovator drug at the same time, and so we may be faced with the cost and distraction of multiple lawsuits. We may also determine it is necessary to settle the lawsuit in a manner that allows the generic company to enter

our market prior to the expiration of our patent or otherwise in a manner that adversely affects the strength, validity or enforceability of our patent.

A number of pharmaceutical companies have been the subject of intense review by the FTC or a corresponding agency in another country based on how they have conducted or settled drug patent litigation, and certain reviews have led to an allegation of an antitrust violation, sometimes resulting in a fine or loss of rights. We cannot be sure that we would not also be subject to such a review or that the result of the review would be favorable to us, which could result in a fine or penalty.

The FTC has brought a number of lawsuits in federal court in the past few years to challenge Hatch-Waxman Act ANDA litigation settlements between innovator companies and generic companies as anti-competitive. As an example, the FTC has taken an aggressive position that anything of value is a payment, whether money is paid or not. Under its approach, if an innovator as part of a patent settlement agrees not to launch or delay launch of an authorized generic during the 180-day period granted to the first generic company to challenge an Orange Book-listed patent covering an innovator drug, or negotiates a delay in entry without payment, the FTC may consider it an unacceptable reverse payment. The pharmaceutical industry argues that such agreements are rational business decisions to dismiss risk and are immune from antitrust attack if the terms of the settlement are within the scope of the exclusionary potential of the patent. In 2013, the U.S. Supreme Court, in a five-to-three decision in FTC v. Actavis, Inc., rejected both the pharmaceutical industry's and FTC's arguments with regard to so-called reverse payments, and held that whether a "reverse payment" settlement involving the exchange of consideration for a delay in entry is subject to an anticompetitive analysis depends on five considerations: (a) the potential for genuine adverse effects on competition; (b) the justification of payment; (c) the patentee's ability to bring about anticompetitive harm; (d) whether the size of the payment is a workable surrogate for the patent's weakness; and (e) that antitrust liability for large unjustified payments does not prevent litigating parties from settling their lawsuits, for example, by allowing the generic to enter the market before the patent expires without the patentee's paying the generic. Furthermore, whether a reverse payment is justified depends upon its size, its scale in relation to the patentee's anticipated future litigation costs, its independence from other services for which it might represent payment, as was the case in Actavis, and the lack of any other convincing justification. The Court held that reverse payment settlements can potentially violate antitrust laws and are subject to the standard antitrust rule-of-reason analysis, with the burden of proving that an agreement is unlawful on the FTC, leaving to lower courts the structuring of such rule of reason analysis. If we are faced with drug patent litigation, including Hatch-Waxman Act litigation with a generic company, we could be faced with such an FTC challenge based on that activity, including how or whether we settle the case, and even if we strongly disagree with the FTC's position, we could face a significant expense or penalty.

Patent terms may be inadequate to protect our competitive position on our products for an adequate amount of time.

The term of any individual patent depends on applicable law in the country where the patent is granted. In the United States, provided all maintenance fees are timely paid, a patent generally has a term of 20 years from its application filing date or earliest claimed non-provisional filing date. Extensions may be available under certain circumstances, but the life of a patent and, correspondingly, the protection it affords is limited. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. For patents that are eligible for extension of patent term, we expect to seek extensions of patent terms in the United States and, if available, in other countries, however there can be no assurance that we will be granted any patent term extension we seek, or that any such patent term extension will provide us with any competitive advantage.

The Hatch-Waxman Act in the United States provides for the opportunity to seek a patent term extension on one selected patent for each of our products, and the length of that patent term extension, if at all, is subject to review and approval by the USPTO and the FDA.

In the United States, the Hatch-Waxman Act permits one patent term extension of up to five years beyond the normal expiration of one patent per product, which if a method of treatment patent, is limited to the approved indication (or any additional indications approved during the period of extension). The length of the patent term extension is typically calculated as one half of the clinical trial period plus the entire period of time during the review of the NDA by the FDA, minus any time of delay by us during these periods. There is also a limit on the patent term extension to a term that is no greater than fourteen years from drug approval. Therefore, if we select and are granted a patent term extension on a recently filed and issued patent, we may not receive the full benefit of a possible patent term extension, if at all. We might also not be granted a patent term extension at all, because of, for example, failure to apply within the applicable period, failure to apply prior to the expiration of relevant patents or otherwise failure to satisfy any of the numerous applicable requirements. Moreover, the applicable authorities, including the FDA and the USPTO in the United States, and any equivalent regulatory authorities in other countries, may not agree with our assessment of whether such extensions are available, may refuse to grant extensions to our patents, or may grant more limited extensions than we request. If this occurs, our competitors may be able to obtain approval of competing products following our patent expiration by referencing our clinical and preclinical data and launch their product earlier than might otherwise be the case. If this were to occur, it could have a material adverse effect on our ability to generate product revenue.

In 1997, as part of the Food & Drug Administration Modernization Act, or FDAMA, Congress enacted a law that provides incentives to drug manufacturers who conduct studies of drugs in children. The law, which provides six months of exclusivity in return for conducting pediatric studies, is referred to as the pediatric exclusivity provision. If clinical studies are carried out by us that comply with the FDAMA, we may receive an additional six-month term added to our regulatory data exclusivity period and our patent term extension period, if received, on our product. However, if we choose not to carry out pediatric studies that comply with the FDAMA, or are not accepted by the FDA for this purpose, we would not receive this additional six-month exclusivity extension to our data exclusivity or our patent term extension.

In Europe, supplementary protection certificates are available to extend a patent term up to five years to compensate for patent term lost during regulatory review, and can be extended for an additional six months if data from clinical trials is obtained in accordance with an agreed-upon pediatric investigation plan. Although all countries in Europe must provide supplementary protection certificates, there is no unified legislation among European countries and so supplementary protection certificates must be applied for and granted on a country-by-country basis. This can lead to a substantial cost to apply for and receive these certificates, which may vary among countries or not be provided at all.

If we are unable to obtain licenses from third parties on commercially reasonable terms or at all, or fail to comply with our obligations under such agreements, our business could be harmed.

It may be necessary for us to use the patented or other proprietary technology of third parties to commercialize our products, in which case we would be required to obtain a license from these third parties. If we are unable to license such technology, or if we are forced to license such technology on unfavorable terms, our business could be materially harmed. If we are unable to obtain a necessary license, we may be unable to develop or commercialize the affected product candidates, which could materially harm our business and the third parties owning or otherwise controlling such intellectual property rights could seek either an injunction prohibiting our sales or an obligation on our part to pay royalties and/or other forms of compensation. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors and other third parties access to the

same technologies licensed to us. The licensing or acquisition of third-party intellectual property rights is a competitive area, and several more established companies may pursue strategies to license or acquire third-party intellectual property rights that we may consider attractive or necessary. These established companies may have a competitive advantage over us due to their size, capital resources and greater clinical development and commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us.

If we are unable to obtain rights to required third-party intellectual property rights or maintain the existing intellectual property rights we have, we may be required to expend significant time and resources to redesign our technology, product candidates or the methods for manufacturing them or to develop or license replacement technology, all of which may not be feasible on a technical or commercial basis. If we are unable to do so, we may be unable to develop or commercialize the affected technology and product candidates, which could harm our business, financial condition, results of operations and prospects significantly.

Additionally, if we fail to comply with our obligations under any future license agreements, our counterparties may have the right to terminate these agreements, in which event we might not be able to develop, manufacture or market, or may be forced to cease developing, manufacturing or marketing, any product that is covered by these agreements or may face other penalties under such agreements. Such an occurrence could materially adversely affect the value of the product candidate being developed under any such agreement. Termination of these agreements or reduction or elimination of our rights under these agreements, or restrictions on our ability to freely assign or sublicense our rights under such agreements when it is in the interest of our business to do so, may result in our having to negotiate new or reinstated agreements with less favorable terms, cause us to lose our rights under these agreements, including our rights to important intellectual property or technology, or impede, or delay or prohibit the further development or commercialization of one or more product candidates that rely on such agreements.

Although we are not currently involved in any relevant litigation, we may become involved in lawsuits to protect or enforce our patents or other intellectual property, which could be expensive, time-consuming and unsuccessful.

Competitors and other third parties may infringe, misappropriate or otherwise violate our or our future licensors' patents, trademarks, copyrights or other intellectual property. As a result, we may need to file infringement, misappropriation or other intellectual property-related claims against third parties. To counter infringement or other unauthorized use, we may be required to file claims on a country-by-country basis, which can be expensive and time-consuming and divert the time and attention of our management and scientific personnel. There can be no assurance that we will have sufficient financial or other resources to file and pursue such claims, which often last for years before they are concluded.

Any claims we assert against third parties could also provoke these parties to assert counterclaims against us alleging that we infringe, misappropriate or otherwise violate their intellectual property. In addition, in a patent infringement proceeding, such parties could counterclaim that the patents we have asserted are invalid or unenforceable, or both. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. Third parties may institute such claims before administrative bodies in the United States or abroad, even outside the context of litigation. Such mechanisms include re-examination, post-grant review, *inter partes* review, interference proceedings, derivation proceedings and equivalent proceedings in foreign jurisdictions (*e.g.,* opposition proceedings). The outcome following legal assertions of invalidity and unenforceability is unpredictable.

In any such proceeding, a court may decide that a patent of ours, or a patent that we in-license, is not valid, is unenforceable and/or is not infringed, or may construe such patent's claims narrowly or refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated, interpreted narrowly or held unenforceable in whole or in part, could put our patent applications at risk of not issuing, and could limit our ability to assert those patents against those parties or other competitors and curtail or preclude our ability to exclude third parties from making and selling similar or competitive products. Similarly, if we assert trademark infringement claims, a court may determine that the marks we have asserted are invalid or unenforceable, or that the party against whom we have asserted trademark infringement has superior rights to the marks in question. In this case, we could ultimately be forced to cease use of such trademarks, which could materially harm our business and negatively affect our position in the marketplace.

Even if we establish infringement, misappropriation or other violation of our intellectual property, the court may decide not to grant an injunction against further such activity and instead award only monetary damages, which may or may not be an adequate remedy. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations, and prospects.

Weakening patent laws and enforcement by courts and other authorities in the United States and other jurisdictions may impact our ability to protect our patents.

The U.S. Supreme Court has issued opinions in patent cases in the last few years that many consider may weaken patent protection in the United States, either by narrowing the scope of patent protection available in certain circumstances, holding that certain kinds of innovations are not patentable or generally otherwise making it easier to invalidate patents in court. Additionally, there have been recent proposals for additional changes to the patent laws of the United States and other countries that, if adopted, could impact our ability to obtain patent protection for our proprietary technology or our ability to enforce our proprietary technology. Depending on future actions by the U.S. Congress, the U.S. courts, the USPTO and the relevant law-making and other bodies in other countries, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce and defend our existing patents and patents that we might obtain in the future.

The laws of some foreign jurisdictions do not protect intellectual property rights to the same extent as in the United States and many companies have encountered significant difficulties in protecting and defending such rights in foreign jurisdictions. If we encounter such difficulties in protecting or are otherwise precluded from effectively protecting our intellectual property rights in foreign jurisdictions, our business prospects could be substantially harmed. For example, we could become a party to foreign opposition proceedings, such as at the EPO, or patent litigation and other proceedings in a foreign court. If so, uncertainties resulting from the initiation and continuation of such proceedings could have a material adverse effect on our ability to compete in the marketplace. The cost of foreign adversarial proceedings can also be substantial, and in many foreign jurisdictions, the losing party must pay the attorney fees of the winning party.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

The USPTO, EPO and other patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to be paid to the USPTO and various governmental patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. We have systems in place to remind us to pay these fees, and we employ an outside firm and rely on our outside counsel to pay such fees due to non-U.S. patent agencies. While, in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors or other third parties might be able to enter the market with similar or identical products or technology, which could have a material adverse effect on our business, financial condition, results of operations, and prospects.

We may not be able to enforce our intellectual property rights throughout the world.

Filing, prosecuting and defending patents on our product candidates in all countries throughout the world would be prohibitively expensive. Therefore, we may choose not to pursue or maintain protection for certain intellectual property in certain jurisdictions. The requirements for patentability may differ in certain countries, particularly in developing countries. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we may obtain patent protection, but where patent enforcement is not as strong as that in the United States. These products may compete with our products in jurisdictions where we do not have any issued or licensed patents and any future patent claims or other intellectual property rights may not be effective or sufficient to prevent them from so competing.

Moreover, our ability to protect and enforce our intellectual property rights may be adversely affected by changes in foreign intellectual property laws. Additionally, laws of some countries outside of the United States and Europe do not afford intellectual property protection to the same extent as the laws of the United States and Europe. Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. The legal systems of some countries, including India, China and other developing countries, may not favor the enforcement of our patents and other intellectual property rights.

This could make it difficult for us to stop the infringement of our patents or the misappropriation or other violation of our other intellectual property rights. A number of foreign countries have stated that they are willing to issue compulsory licenses to patents held by innovator companies on approved drugs to allow the government or one or more third-party companies to sell the approved drug without the permission of the innovator patentee where the foreign government concludes it is in the public interest. India, for example, has used such a procedure to allow domestic companies to make and sell patented drugs without innovator approval. There is no guarantee that patents covering any of our drugs will not be subject to a compulsory license in a foreign country, or that we will have any influence over if or how such a compulsory license is granted. Further, Brazil allows its regulatory agency ANVISA to participate in deciding whether to grant a drug patent in Brazil, and patent grant decisions are made based on several factors, including whether the patent meets the requirements for a patent and whether such a patent is deemed in the country’s interest. In addition, several other countries have created laws that make it more difficult to enforce drug patents than patents on other kinds of technologies. Further, under the treaty on the Trade-Related Aspects of Intellectual Property, or

TRIPS, as interpreted by the Doha Declaration, countries in which drugs are manufactured are required to allow exportation of the drug to a developing country that lacks adequate manufacturing capability. Therefore, our drug markets in the United States or foreign countries may be affected by the influence of current public policy on patent issuance, enforcement or involuntary licensing in the healthcare area.

In addition, in November 2015, members of the World Trade Organization, or WTO, which administers TRIPS, voted to extend the exemption against enforcing pharmaceutical drug patents in least developed countries until 2033. We currently have no patent applications filed in least developed countries, and our current intent is not to file in these countries in the future, at least in part due to this WTO pharmaceutical patent exemption.

We rely on our ability to stop others from competing by enforcing our patents, however some jurisdictions may require us to grant licenses to third parties. Such compulsory licenses could be extended to include some of our product candidates, which may limit our potential revenue opportunities.

Many foreign countries have compulsory licensing laws under which a patent owner must grant licenses to third parties, in certain circumstances. For example, compulsory licensing, or the threat of compulsory licensing, of life-saving products and expensive products is becoming increasingly popular in developing countries, either through direct legislation or international initiatives. Compulsory licenses could be extended to include some of our product candidates, if they receive marketing approval, which may limit our potential revenue opportunities. Consequently, we may not be able to prevent third parties from practicing our inventions in certain countries outside the United States and Europe. Competitors may also use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we have patent protection, if our ability to enforce our patents to stop infringing activities is inadequate. These products may compete with our products, and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing. Proceedings to enforce our patent rights in foreign jurisdictions, whether or not successful, could result in substantial costs and divert our efforts and resources from other aspects of our business. Furthermore, while we intend to protect our intellectual property rights in major markets for our products where such patent rights exist, we cannot ensure that we will be able to initiate or maintain similar efforts in all jurisdictions in which we may wish to market our products. Accordingly, our efforts to protect our intellectual property rights in such countries may be inadequate.

In addition, some countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may be limited to monetary relief and may be unable to enjoin infringement if a government is the infringer, which could materially diminish the value of the patent.

If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to the protection afforded by patents, we rely on trade secret protection and confidentiality agreements to protect proprietary know-how that is either not patentable or that we elect not to patent, processes for which patents are difficult to enforce and any other elements of our product candidate discovery and development processes that involve proprietary know-how, information or technology that is not covered by patents. However, trade secrets can be difficult to protect. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with parties who have access to them, such as our employees, CROs, consultants, scientific advisors and other contractors. We cannot guarantee that we have entered into such agreements with each party that may have or have had access to our trade secrets or proprietary technology and processes. We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these individuals, organizations and systems,

agreements or security measures may be breached and our trade secrets could be disclosed, and we may not have adequate remedies for any such breach. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. Misappropriation or unauthorized disclosure of our trade secrets or other confidential proprietary information could cause us to lose trade secret protection, impair our competitive position and have a material adverse effect on our business. Additionally, if the steps taken to maintain our trade secrets or other confidential
proprietary information are deemed inadequate, we may have insufficient recourse against third parties for misappropriating the trade secret or other confidential proprietary information.

Further, we cannot provide any assurances that competitors or other third parties will not otherwise gain access to our trade secrets and other confidential proprietary information or independently discover or develop substantially equivalent technology and processes. If we are unable to prevent disclosure of the trade secrets and other non-patented intellectual property related to our product candidates and technologies to third parties, there is no guarantee that we will have any such enforceable trade secret protection and we may not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business, results of operations and financial condition.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of third parties, that our employees have wrongfully used or disclosed alleged trade secrets of their former employers, or asserting ownership of what we regard as our own intellectual property.

We have employed, and may in the future employ, individuals who were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees, consultants and independent contractors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed intellectual property, including trade secrets or other proprietary information, of any of such individuals' former employers or other third parties. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel, or our ability to hire personnel, which, in any case of the foregoing, could adversely impact our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Although it is our policy to require all of our employees and consultants to assign their inventions to us, to the extent that employees or consultants use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions. We may also be unsuccessful in executing such an agreement with each party who, in fact, conceives or develops intellectual property that we regard as our own. The assignment of intellectual property rights may not be self-executing, or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property. Such claims could have a material adverse effect on our business, financial condition, results of operations, and prospects.

Our proprietary rights may not adequately protect our technologies and product candidates, and intellectual property rights do not necessarily address all potential threats to our competitive advantage.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect our business, or permit us to maintain our competitive advantage. The following examples are illustrative:

- others may be able to make products that are the same as or similar to our product candidates but that are not covered by the claims of our patents;
- others, including inventors or developers of our patented technologies who may become involved with competitors, may independently develop similar technologies that function as alternatives or replacements for any of our technologies without infringing, misappropriating or otherwise violating our intellectual property rights;
- we might not have been the first to conceive and reduce to practice the inventions covered by our patents or patent applications;
- we might not have been the first to file patent applications covering certain of our inventions;
- we may choose not to file a patent in order to maintain certain trade secrets or know-how, and a third party may subsequently file a patent covering such intellectual property;
- our pending patent applications might not result in issued patents;
- there might be prior public disclosures that could invalidate our patents;
- our issued patents may not provide us with any commercially viable products or competitive advantage, or may be held invalid or unenforceable, as a result of legal challenges by our competitors or other third parties;
- the Supreme Court of the United States, other U.S. federal courts, Congress, the USPTO or similar foreign authorities may change the standards of patentability and any such changes could narrow or invalidate, or change the scope of, our patents;
- patent terms may be inadequate to protect our competitive position on our product candidates for an adequate amount of time;
- our competitors or other third parties might conduct research and development activities in countries where we do not have patent rights, or in countries where research and development safe harbor laws exist, and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- ownership, validity or enforceability of our patents or patent applications may be challenged by third parties; and
- the patents or pending or future applications of third parties, if issued, may have an adverse effect on our business.

Should any of these events occur, they could have a material adverse effect on our business, financial condition, results of operations, and prospects.

Risks Related to Employee Matters, Managing Growth and Other Risks Related to Our Business

We will need to expand our organization, and we may experience difficulties in managing this growth, which could disrupt our operations.

We expect to experience significant growth over time in the number of our employees and the scope of our operations, particularly in the areas of product candidate development, regulatory and clinical affairs and sales, marketing and distribution. To manage our growth activities, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. As we expand our organization, we may have difficulty identifying, hiring and integrating new personnel. Future growth would impose significant additional responsibilities on our management, including:

- the need to identify, recruit, maintain, motivate and integrate additional employees, consultants and contractors;
- managing our internal development efforts effectively, including the clinical and FDA review process for our product candidates, while complying with our contractual obligations to contractors and other third parties; and
- improving our operational, financial and management controls, reporting systems and procedures.

Also, our management may need to divert a disproportionate amount of its attention away from our day-to-day activities and devote a substantial amount of time to managing these growth activities. We may not be able to effectively manage the expansion of our operations, which may result in weaknesses in our infrastructure, give rise to operational mistakes, loss of business opportunities, loss of employees and reduced productivity among remaining employees. Our expected growth could require significant capital expenditures and may divert financial resources from other projects, such as the development of product candidates. If our management is unable to effectively manage our growth, our expenses may increase more than expected, our ability to generate and/or grow product revenues could be reduced, and we may not be able to implement our business strategy. Our future financial performance and our ability to commercialize our product candidates and compete effectively will depend, in part, on our ability to effectively manage any future growth.

We currently rely, and for the foreseeable future will continue to rely, in substantial part on certain independent organizations, advisors and consultants to provide certain services, including substantially all aspects of regulatory approval, clinical trial management and manufacturing. There can be no assurance that the services of independent organizations, advisors and consultants will continue to be available to us on a timely basis when needed, or that we can find qualified replacements. In addition, if we are unable to effectively manage our outsourced activities or if the quality or accuracy of the services provided by consultants is compromised for any reason, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval of our product candidates or otherwise advance our business. There can be no assurance that we will be able to manage our existing consultants or find other competent outside contractors and consultants on economically reasonable terms, or at all. If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, or we are not able to effectively build out new facilities to accommodate this expansion, we may not be able to successfully implement the tasks necessary to further develop and commercialize our product candidates and, accordingly, may not achieve our research, development and commercialization goals.

Many of the biotechnology and pharmaceutical companies that we compete against for qualified personnel and consultants have greater financial and other resources, different risk profiles and a longer history in the industry than we do. If we are unable to continue to attract and retain high-quality personnel and consultants, the rate and success at which we can discover and develop product candidates and operate our business will be limited.

We only have a limited number of employees to manage and operate our business.

As of September 30, 2020, we had 19 full-time employees. Our focus on the development of AT-527 alone requires us to manage and operate our business in a highly efficient manner. We cannot assure you that we will be able to hire and/or retain adequate staffing levels to develop our product candidates or run our operations and/or to accomplish all of the objectives that we otherwise would seek to accomplish.

If we lose key management or scientific personnel, cannot recruit qualified employees, directors, officers or other significant personnel or experience increases in our compensation costs, our business may materially suffer.

We are highly dependent on our management and directors, including our Chief Executive Officer, Jean-Pierre Sommadossi, Ph.D., among others. Due to the specialized knowledge each of our officers and key employees possesses with respect to our product candidates and our operations, the loss of service of any of our officers or directors could delay or prevent the successful enrollment and completion of our clinical trials. We do not carry key person life insurance on any officers or directors. In general, the employment arrangements that we have with our executive officers do not prevent them from terminating their employment with us at any time.

In addition, our future success and growth will depend in part on the continued service of our directors, employees and management personnel and our ability to identify, hire and retain additional personnel. If we lose one or more of our executive officers or key employees, our ability to implement our business strategy successfully could be seriously harmed. Furthermore, replacing executive officers and key employees may be difficult or costly and may take an extended period of time because of the limited number of individuals in our industry with the breadth of skills and experience required to develop, gain regulatory approval of and commercialize product candidates successfully. Competition to hire from this limited pool is intense, and we may be unable to hire, train, retain or effectively incentivize these additional key personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be engaged by entities other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us. If we are unable to continue to attract and retain high quality personnel, our ability to develop and commercialize product candidates will be limited.

Many of our employees have become or will soon become vested in a substantial amount of our common stock or a number of common stock options. Our employees may be more likely to leave us if the shares they own have significantly appreciated in value relative to the original purchase prices of the shares, or if the exercise prices of the options that they hold are significantly below the market price of our common stock, particularly after the expiration of the lock-up agreements described herein. Our future success also depends on our ability to continue to attract and retain additional executive officers and other key employees.

We may engage in acquisitions or strategic partnerships that could disrupt our business, cause dilution to our stockholders, reduce our financial resources, cause or to incur debt or assume contingent liabilities, and subject us to other risks.

In the future, we may enter into transactions to acquire other businesses, products or technologies or enter into strategic partnerships, including licensing. If we do identify suitable acquisition or partnership candidates, we may not be able to make such acquisitions or partnerships on favorable terms, or at all. Any acquisitions or partnerships we make may not strengthen our competitive position, and these transactions may be viewed negatively by customers or investors, and we may never realize the anticipated benefits of such acquisitions or partnerships. We may decide to incur debt in connection with an acquisition or issue our common stock or other equity securities to the stockholders of the acquired company, which would reduce the percentage ownership of our existing stockholders. We could incur losses resulting from undiscovered liabilities of the acquired business or partnership that are not covered by the indemnification we may obtain from the seller or our partner. In addition, we may not be able to successfully integrate any acquired personnel, technologies and operations into our existing business in an effective, timely and non-disruptive manner. Acquisitions or partnerships may also divert management attention from day-to-day responsibilities, lead to a loss of key personnel, increase our expenses and reduce our cash and cash equivalents available for operations and other uses. We cannot predict the number, timing or size of future acquisitions or partnerships or the effect that any such transactions might have on our operating results.

We or the third parties upon whom we depend may be adversely affected by natural disasters or pandemics and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Natural disasters or pandemics, other than or in addition to COVID-19, could severely disrupt our operations and have a material adverse effect on our business, results of operations, financial condition and prospects. If a natural disaster, power outage, pandemic, such as the COVID-19 pandemic, or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as the manufacturing facilities on which we rely, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place may prove inadequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which could have a material adverse effect on our business.

Litigation against us could be costly and time-consuming to defend and could result in additional liabilities.

We may from time to time be subject to legal proceedings and claims that arise in the ordinary course of business or otherwise, such as claims brought by our customers in connection with commercial disputes and employment claims made by our current or former employees. Claims may also be asserted by or on behalf of a variety of other parties, including government agencies, patients or vendors of our customers, or stockholders.

Any litigation involving us may result in substantial costs, operationally restrict our business, and may divert management’s attention and resources, which may seriously harm our business, overall financial condition and results of operations. Insurance may not cover existing or future claims, be sufficient to fully compensate us for one or more of such claims, or continue to be available on terms acceptable to us. A claim brought against us that is uninsured or underinsured could result in unanticipated costs, thereby adversely impacting our results of operations and resulting in a reduction in the trading price of our stock.

Unstable market and economic conditions may have serious adverse consequences on our business, financial condition and share price.

The global economy, including credit and financial markets, has experienced extreme volatility and disruptions, including severely diminished liquidity and credit availability, declines in consumer confidence, declines in

economic growth, increases in unemployment rates and uncertainty about economic stability. For example, the COVID-19 pandemic has resulted in a widespread unemployment, an economic slowdown and extreme volatility in the capital markets. If the equity and credit markets deteriorate, it may make any necessary debt or equity financing more difficult to obtain in a timely manner or on favorable terms, more costly or more dilutive. In addition, there is a risk that one or more of our CROs, suppliers, CMOs or other third-party providers may not survive an economic downturn. As a result, our business, results of operations and price of our common stock may be adversely affected.

The United Kingdom's withdrawal from the European Union may have a negative effect on global economic conditions, financial markets, and our business, which could reduce our share price.

On January 31, 2020, the United Kingdom formally withdrew from the European Union. The potential impact of the withdrawal of the United Kingdom will vary significantly depending on the exit route that is negotiated and agreed between the European Union and the United Kingdom during the transition period, which is due to end December 31, 2020. For example, companies in the United Kingdom could lose access to the benefits of certain EU directives (such as the interest and royalties directive and the parent-subsidiary directive), which apply only to arrangements concerning EU Member States.

These developments have had and may continue to have a significant adverse effect on global economic conditions and the stability of global financial markets, and could significantly reduce global market liquidity and restrict the ability of key market participants to operate in certain financial markets. In particular, it could also lead to a period of considerable uncertainty in relation to the U.K. financial and banking markets, as well as on the regulatory process in the United Kingdom and in Europe. As a result of this uncertainty, global financial markets could experience significant volatility, which could adversely affect the market price of our common stock. Asset valuations, currency exchange rates, and credit ratings may also be subject to increased market volatility. Lack of clarity about future U.K. laws and regulations as the United Kingdom determines which European Union rules and regulations to replace or replicate after withdrawal, including financial laws and regulations, tax and free trade agreements, intellectual property rights, data protection laws, supply chain logistics, environmental, health, and safety laws and regulations, immigration laws, and employment laws, could decrease foreign direct investment in the United Kingdom, increase costs, depress economic activity, and restrict our access to capital. If the United Kingdom and the European Union are unable to negotiate acceptable withdrawal terms or if other EU Member States pursue withdrawal, barrier-free access between the United Kingdom and other EU Member States or among the European Economic Area overall could be diminished or eliminated.

We may also face new regulatory costs and challenges that could have an adverse effect on our operations. Depending on the terms of Brexit, the United Kingdom could lose the benefits of global trade agreements negotiated by the European Union on behalf of its members, which may result in increased trade barriers that could make our doing business in Europe more difficult. In addition, currency exchange rates between the pound sterling, the euro and the U.S. dollar have already been, and may continue to be, affected by Brexit.

Risks Related to Our Common Stock and this Offering

An active trading market for our common stock may not develop.

Prior to this offering, there has been no public market for our common stock. The initial public offering price for our common stock will be determined through negotiations with the underwriters. Although we intend to apply to have our common stock listed on the Nasdaq Global Market, an active trading market for our shares may never develop or be sustained following this offering. If an active market for our common stock does not develop, it may be difficult for you to sell shares you purchase in this offering without depressing the market

price for the shares, or at all. Further, an inactive market may also impair our ability to raise capital by selling shares of our common stock and may impair our ability to enter into strategic partnerships or acquire companies or products by using our shares of common stock as consideration.

The market price of our common stock may be volatile and fluctuate substantially, which could result in substantial losses for purchasers of our common stock in this offering.

Our stock price is likely to be volatile. The stock market in general and the market for smaller biopharmaceutical companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, you may not be able to sell your common stock at or above the initial public offering price. The market price for our common stock may be influenced by many factors, including:

- the success of competitive products or technologies;
- actual or expected changes in our growth rate relative to our competitors;
- results of our ongoing, planned or any future preclinical studies, clinical trials or clinical development of our product candidates or those of our competitors;
- unanticipated serious safety concerns related to the use of our product candidates;
- developments related to our existing or any future collaborations;
- developments concerning our manufacturers or our manufacturing plans;
- our inability to obtain adequate product supply for any approved product or inability to do so at acceptable prices;
- regulatory actions with respect to our product candidates or our competitors' products and product candidates;
- regulatory or legal developments in the United States and other countries;
- development of third-party product candidates that may address our markets and make our product candidates less attractive;
- changes in physician, hospital or healthcare provider practices that may make our product candidates less useful;
- our decision to initiate a clinical trial, not to initiate a clinical trial or to terminate an existing clinical trial;
- our failure to commercialize our product candidates;
- announcements by us, our partners or our competitors of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments;
- developments or disputes concerning patent applications, issued patents or other intellectual property or proprietary rights;
- the recruitment or departure of key scientific or management personnel;
- the level of expenses related to any of our product candidates or clinical development programs;
- failure to meet or exceed financial estimates and projections of the investment community or that we provide to the public;

- changes in accounting practices;
- the trading volume of our common stock;
- our cash and cash equivalents position;
- our ability to effectively manage our growth;
- sales of our common stock by us or our stockholders in the future;
- publication of research reports about us or our industry, or positive or negative recommendations or withdrawal of research coverage by securities analysts;
- ineffectiveness of our internal controls;
- significant lawsuits, including intellectual property or stockholder litigation;
- the results of our efforts to discover, develop, acquire or in-license additional product candidates or products;
- actual or expected changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- actual or anticipated variations in our financial results or those of companies that are perceived to be similar to us;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry and market conditions; and
- the other factors described in this “Risk Factors” section and elsewhere in this prospectus.

In addition, the stock market in general, and The Nasdaq Global Market and biopharmaceutical companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our common shares, regardless of our actual operating performance. If the market price of our common shares after this offering does not exceed the initial public offering price, you may not realize any return on your investment in us and may lose some or all of your investment. In the past, securities class action litigation has often been instituted against companies following periods of volatility in the market price of a company’s securities. This type of litigation, if instituted, could result in substantial costs and a diversion of management’s attention and resources, which would harm our business, financial condition and results of operations.

After this offering, our executive officers, directors and principal stockholders, if they choose to act together, will continue to have the ability to control or significantly influence all matters submitted to stockholders for approval.

Upon the closing of this offering, based on the number of shares of common stock outstanding as of , our executive officers, directors and stockholders who owned more than 5% of our outstanding common stock before this offering and their respective affiliates will, in the aggregate, hold shares representing approximately % of our outstanding voting stock (assuming no exercise of the underwriters’ option to purchase additional shares). As a result, if these stockholders choose to act together, they would be able to control or significantly influence all matters submitted to our stockholders for approval, as well as our management and affairs. For example, these persons, if they choose to act together, would control or significantly influence the election of directors, the composition of our management and approval of any merger, consolidation or sale of all or substantially all of our assets.

If you purchase shares of common stock in this offering, you will suffer immediate dilution of your investment.

The initial public offering price of our common stock will be substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of our common stock in this offering, you will pay a price per share that substantially exceeds our net tangible book value per share after this offering. To the extent shares subsequently are issued under outstanding options or warrants, you will incur further dilution. Based on an assumed initial public offering price of $ per share (the midpoint of the price range set forth on the cover page of this prospectus), you will experience immediate dilution of $ per share as of , representing the difference between our pro forma as adjusted net tangible book value per share, after giving effect to this offering, and the assumed initial public offering price. In addition, purchasers of common stock in this offering will have contributed approximately % of the aggregate price paid by all purchasers of our stock but will own only approximately % of our common stock outstanding after this offering.

This dilution is due to our investors who purchased shares of our common stock prior to this offering, having paid substantially less when they purchased their shares of common stock than the price offered to the public in this offering. To the extent that outstanding stock options or warrants are exercised, there will be further dilution to new investors. As a result of the dilution to investors purchasing shares of common stock in this offering, investors may receive significantly less than the purchase price paid in this offering, if anything, in the event of our liquidation. For a further description of the dilution that you will experience immediately after this offering, see the section entitled “Dilution.”

We have broad discretion in the use of the net proceeds from this offering and may not use them effectively.

Our management will have broad discretion in the application of the net proceeds from this offering, including for any of the purposes described in the section entitled “Use of Proceeds,” and could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. We anticipate that we will use the net proceeds from this offering, together with our existing cash and cash equivalents, to advance the clinical development of AT-527 for the treatment of moderate COVID-19, AT-787 for the treatment of chronic HCV, AT-752 for the treatment of dengue, our RSV program, and the remainder, if any, for working capital and other general corporate purposes. See “Use of Proceeds.” However, our use of these proceeds may differ substantially from our current plans. The failure by our management to apply these funds effectively could result in financial losses that could have a material adverse effect on our business, cause the price of our common stock to decline and delay the development of our product candidates. Pending their use, we may invest the net proceeds from this offering in a manner that does not produce income or that loses value.

Our principal stockholder and management own a significant percentage of our shares of common stock and will be able to exert significant influence over matters subject to stockholder approval.

Upon the closing of this offering, based on the number of shares outstanding as of , our executive officers, directors, and 5% stockholders will beneficially own approximately % of our common shares, assuming the sale by us of shares of common stock in this offering, and not accounting for any shares of common stock purchased in this offering by certain of our existing stockholders (or their affiliates). Therefore, after this offering, these stockholders will have the ability to influence us through this ownership position. These stockholders may be able to determine all matters requiring stockholders approval. For example, these stockholders may be able to control elections of directors, amendments of our organizational documents or approval of any merger, sale of assets or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our shares of common stock that you may feel are in your best interest as one of our stockholders.

A significant portion of our total outstanding shares are eligible to be sold into the market in the near future, which could cause the market price of our common stock to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. After this offering, we will have outstanding shares of common stock based on the number of shares outstanding as of September 30, 2020. This includes the shares that we are selling in this offering, which may be resold in the public market immediately without restriction, unless purchased by our affiliates or existing stockholders. The remaining shares are currently restricted as a result of securities laws or lock-up agreements (which may be waived, with or without notice, pursuant to the terms of such lock-up agreement), but will become eligible to be sold at various times beginning 180 days after this offering, unless held by one of our affiliates, in which case the resale of those securities will be subject to volume limitations under Rule 144 of the Securities Act of 1933, as amended, or Rule 144. Moreover, after this offering, holders of an aggregate of shares of our common stock will have rights, subject to specified conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders, until such shares can otherwise be sold without restriction under Rule 144 or until the rights terminate pursuant to the terms of the stockholders' agreement between us and such holders. We also intend to register all shares of common stock that we may issue under our equity compensation plans. Once we register these shares, they can be freely sold in the public market upon issuance, subject to volume limitations applicable to affiliates and the lock-up agreements described in the "Underwriting" section of this prospectus.

We are an "emerging growth company," and the reduced disclosure requirements applicable to emerging growth companies may make our common stock less attractive to investors.

We are an "emerging growth company," as defined in the JOBS Act, and may remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the date of the closing of this offering, (b) in which we have total annual gross revenue of at least $1.07 billion or (c) in which we are deemed to be a large accelerated filer, which requires the market value of our common shares that are held by non-affiliates to exceed $700 million as of the prior June 30th, and (2) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure in this prospectus;
- not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We have taken advantage of reduced reporting burdens in this prospectus. In particular, in this prospectus, we have provided only two years of audited financial statements and have not included all of the executive compensation related information that would be required if we were not an emerging growth company. We

cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of these accounting standards until they would otherwise apply to private companies. Further, even after we no longer qualify as an emerging growth company, we may still qualify as a "smaller reporting company," which would allow us to take advantage of many of the same exemptions from disclosure requirements, including reduced obligations regarding executive compensation in our periodic reports and proxy statements. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be reduced or more volatile.

We are a "smaller reporting company" and the reduced disclosure requirements applicable to smaller reporting companies may make our common stock less attractive to investors.

We are considered a "smaller reporting company." We are therefore entitled to rely on certain reduced disclosure requirements for as long as we remain a smaller reporting company, such as an exemption from providing selected financial data and executive compensation information. If we qualify as a smaller reporting company because we meet the revenue limits under the definition of a smaller reporting company, we will be a "low-revenue smaller reporting company." Low-revenue smaller reporting companies are not required to obtain an external audit on the effectiveness of their internal control over financial reporting under Section 404 of the Sarbanes-Oxley Act of 2002, or Section 404. These exemptions and reduced disclosures may make it harder for investors to analyze our results of operations and financial prospects. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock prices may be more volatile.

We will incur increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives and corporate governance practices.

As a public company, and particularly after we are no longer an emerging growth company, we will incur significant legal, accounting and other expenses that we did not incur as a private company. The Sarbanes-Oxley Act of 2002, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements of the Nasdaq Global Market and other applicable securities rules and regulations impose various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, we expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance, which in turn could make it more difficult for us to attract and retain qualified members of our board of directors.

We are evaluating these rules and regulations and cannot predict or estimate the amount of additional costs we may incur or the timing of such costs. These rules and regulations are often subject to varying interpretations, in many cases due to their lack of specificity, and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, or Section 404, in our second annual report due to be filed with the SEC after becoming a public company, we will be required to furnish a report by our management on our internal control over financial reporting. However, while we remain an emerging growth company or a low-revenue smaller reporting company, we will not be required to include an attestation report

on internal control over financial reporting issued by our independent registered public accounting firm. To achieve compliance with Section 404 within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, potentially engage outside consultants, adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing whether such controls are functioning as documented, and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that we will not be able to conclude, within the prescribed timeframe or at all, that our internal control over financial reporting is effective as required by Section 404. We may discover significant deficiencies or material weaknesses in our internal control over financial reporting, which we may not successfully remediate on a timely basis or at all. Any failure to remediate any significant deficiencies or material weaknesses identified by us or to implement required new or improved controls, or difficulties encountered in their implementation, could cause us to fail to meet our reporting obligations or result in material misstatements in our financial statements. If we identify one or more material weaknesses, it could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

If we fail to maintain effective internal control over financial reporting and effective disclosure controls and procedures, we may not be able to accurately report our financial results in a timely manner or prevent fraud, which may adversely affect investor confidence in our company.

We are not currently required to comply with the rules of the SEC implementing Section 404 and, therefore, we are not required to make a formal assessment of the effectiveness of our internal control over financial reporting for that purpose. Upon becoming a public company, we will be required to comply with the SEC's rules implementing Sections 302 and 404 of the Sarbanes-Oxley Act, which require management to certify financial and other information in our quarterly and annual reports and provide an annual management report on the effectiveness of controls over financial reporting. Although we will be required to disclose changes made in our internal controls and procedures on a quarterly basis, we are not required to make our first annual assessment of our internal control over financial reporting pursuant to Section 404 until the year following our first annual report required to be filed with the SEC. As an emerging growth company and a low-revenue smaller reporting company, our independent registered public accounting firm will not be required to attest to the effectiveness of our internal control over financial reporting pursuant to Section 404 until the later of the year following our first annual report required to be filed with the SEC or the date we are no longer an emerging growth company or a low-revenue smaller reporting company. At such time, our independent registered public accounting firm may issue a report that is adverse in the event material weaknesses have been identified in our internal control over financial reporting.

To comply with the requirements of being a public company, we will need to undertake actions, such as implementing new internal controls and procedures and hiring additional accounting or internal audit staff. Testing and maintaining internal control can divert our management's attention from other matters that are important to the operation of our business. In addition, when evaluating our internal control over financial reporting, we may identify material weaknesses that we may not be able to remediate in time to meet the applicable deadline imposed upon us for compliance with the requirements of Section 404. If we identify any material weaknesses in our internal controls over financial reporting or we are unable to comply with the requirements of Section 404 in a timely manner or assert that our internal control over financial reporting is effective, or if our independent registered public accounting firm is unable to express an opinion as to the effectiveness of our internal control over financial reporting once we are no longer an emerging growth company, investors may lose confidence in the accuracy and completeness of our financial reports. As a result, the market price of our common stock could be materially adversely affected.

Our disclosure controls and procedures may not prevent or detect all errors or acts of fraud.

Upon the closing of this offering, we will become subject to the periodic reporting requirements of the Exchange Act. We are continuing to refine our disclosure controls and procedures to provide reasonable assurance that information we must disclose in reports we file or submit under the Exchange Act is accumulated and communicated to management, and recorded, processed, summarized and reported within the time periods specified in the rules and forms of the SEC. We believe that any disclosure controls and procedures, no matter how well-conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met.

These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls. Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected.

If securities or industry analysts do not publish research or reports about our business, or if they issue an adverse or misleading opinion regarding our stock, our stock price and trading volume could decline, even if our business is doing well.

The trading market for our common stock will be influenced by the research and reports that industry or securities analysts publish about us or our business. We do not currently have, and may never obtain, research coverage by securities and industry analysts. If no or few securities or industry analysts commence coverage of us, the trading price for our stock would be negatively impacted. In the event we obtain securities or industry analyst coverage, if any of the analysts who cover us downgrades our common stock or issues an adverse or misleading opinion regarding us, our business model, our intellectual property or our stock performance, or if our target preclinical studies or clinical trials and operating results fail to meet the expectations of analysts, our stock price would likely decline. If one or more of these analysts ceases coverage of us or fails to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

Provisions in our restated certificate of incorporation and restated bylaws and under Delaware law could make an acquisition of our company, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our restated certificate of incorporation and our restated bylaws, which will become effective upon the closing of this offering may discourage, delay or prevent a merger, acquisition or other change in control of our company that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our board of directors is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Among other things, these provisions include those establishing:

- a classified board of directors with three-year staggered terms, which may delay the ability of stockholders to change the membership of a majority of our board of directors;
- no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;

- the exclusive right of our board of directors to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from filling vacancies on our board of directors;
- the ability of our board of directors to authorize the issuance of shares of preferred stock and to determine the terms of those shares, including preferences and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquirer;
- the ability of our board of directors to alter our bylaws without obtaining stockholder approval;
- the required approval of the holders of at least two-thirds of the shares entitled to vote at an election of directors to adopt, amend or repeal our bylaws or repeal the provisions of our restated certificate of incorporation regarding the election and removal of directors;
- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- the requirement that a special meeting of stockholders may be called only by the chairman of the board of directors, the chief executive officer, the president or the board of directors, which may delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors; and
- advance notice procedures that stockholders must comply with in order to nominate candidates to our board of directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of us.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the General Corporation Law of the State of Delaware, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner.

Our restated certificate of incorporation will designate specific courts as the exclusive forum for certain litigation that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us.

Our restated certificate of incorporation, which will become effective upon the closing of this offering, specifies that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for most legal actions involving claims brought against us by stockholders, other than suits brought to enforce any liability or duty created by the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction and any action that the Court of Chancery of the State of Delaware has dismissed for lack of subject matter jurisdiction, which may be brought in another state or federal court sitting in the State of Delaware. Our restated certificate of incorporation also specifies that unless we consent in writing to the selection of an alternate forum, the federal district courts of the United States shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act of 1933. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our restated certificate of incorporation described above.

We believe this provision benefits us by providing increased consistency in the application of Delaware law by chancellors particularly experienced in resolving corporate disputes or federal judges experienced in resolving Securities Act disputes, efficient administration of cases on a more expedited schedule relative to other forums and protection against the burdens of multi-forum litigation. However, the provision may have the effect of

discouraging lawsuits against our directors, officers, employees and agents as it may limit any stockholder's ability to bring a claim in a judicial forum that such stockholder finds favorable for disputes with us or our directors, officers, employees or agents. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with any applicable action brought against us, a court could find the choice of forum provisions contained in our restated certificate of incorporation to be inapplicable or unenforceable in such action. If a court were to find the choice of forum provision contained in our restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect our business, financial condition or results of operations.

Because we do not anticipate paying any cash dividends on our common stock in the foreseeable future, capital appreciation, if any, would be your sole source of gain.

We have never declared or paid any cash dividends on our common stock. We currently anticipate that we will retain all available funds and future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. As a result, capital appreciation, if any, of our common stock would be your sole source of gain on an investment in our common stock for the foreseeable future. See the "Dividend Policy" section of this prospectus for additional information.

We could be subject to securities class action litigation.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because biopharmaceutical companies have experienced significant stock price volatility in recent years. If we face such litigation, it could result in substantial costs and a diversion of management's attention and resources, which could harm our business.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements. All statements other than statements of historical facts contained in this prospectus are forward-looking statements, including, but not limited to, statements regarding our future results of operations and financial position, business strategy, prospective products, product approvals, research and development costs, future revenue, timing and likelihood of success, plans and objectives of management for future operations, future results of anticipated products and prospects, plans and objectives of management. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terms such as “may,” “will,” “should,” “expect,” “plan,” “anticipate,” “could,” “intend,” “target,” “project,” “contemplate,” “believe,” “estimate,” “predict,” “potential,” “would” or “continue” or the negative of these terms or other similar expressions, although not all forward-looking statements contain these words. The forward-looking statements in this prospectus are only predictions and are based largely on our current expectations and projections about future events and financial trends that we believe may affect our business, financial condition and results of operations. These forward-looking statements speak only as of the date of this prospectus and are subject to a number of known and unknown risks, uncertainties and assumptions, including those described under the sections in this prospectus entitled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and elsewhere in this prospectus. These forward-looking statements are subject to numerous risks, including, without limitation, the following:

- our status as a development-stage company and our expectation to incur losses in the future;
- the effects of the COVID-19 pandemic on business operations, the initiation, development and operation of our clinical trials, and patient enrollment of our clinical trials;
- our future capital needs and our need to raise additional funds;
- the prospects of AT-527 and other product candidates, which are still in development;
- our expectations regarding the timing of data from our clinical trials for AT-527 and other product candidates;
- our ability to continuously build a pipeline of product candidates and develop and commercialize drugs;
- our unproven approach to antiviral treatments;
- our ability to enroll patients and volunteers in clinical trials, timely and successfully complete those trials and receive necessary regulatory approvals;
- our ability to establish our own manufacturing facilities and to receive or manufacture sufficient quantities of our product candidates;
- our ability to obtain, maintain, protect and enforce our intellectual property rights;
- federal, state, and foreign regulatory requirements, including FDA regulation of our product candidates;
- the timing of clinical trials and the likelihood of regulatory filings and approvals;
- developments relating to our competitors and our industry;

- our ability to obtain and retain key executives and attract and retain qualified personnel; and
- our ability to successfully manage our growth.

Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified and some of which are beyond our control, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. Moreover, we operate in an evolving environment. New risk factors and uncertainties may emerge from time to time, and it is not possible for management to predict all risk factors and uncertainties. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise. The forward-looking statements contained in this prospectus are excluded from the safe harbor protection provided by the Private Securities Litigation Reform Act of 1995 and Section 27A of the Securities Act of 1933, as amended.

You should read this prospectus and the documents that we reference in this prospectus and have filed as exhibits to the registration statement relating to this offering completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of our forward-looking statements in this prospectus by these cautionary statements.

MARKET AND INDUSTRY DATA

We obtained the market and industry data in this prospectus from our own internal estimates and research as well as from industry and general publications and research, surveys and studies conducted by third parties. Industry publications, studies and surveys generally state that they have been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe that each of these studies and publications is reliable, we have not independently verified market and industry data from third-party sources. Management's estimates are derived from publicly available information, their knowledge of our industry and their assumptions based on such information and knowledge, which we believe to be reasonable. While we believe our internal company research as to such matters is reliable and the market definitions are appropriate, neither such research nor these definitions have been verified by any independent source. This data involves a number of assumptions and limitations which are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, including those described in "Risk Factors." These and other factors could cause our future performance to differ materially from our assumptions and estimates.

USE OF PROCEEDS

We estimate that the net proceeds to us from this offering will be approximately $ million, assuming an initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. If the underwriters' option to purchase additional shares from us is exercised in full, we estimate that our net proceeds will be approximately $ million, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share would increase (decrease) the net proceeds to us from this offering by approximately $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each increase (decrease) of 1,000,000 in the number of shares offered by us as set forth on the cover page of this prospectus, would increase (decrease) the net proceeds to us from this offering by $ million, assuming no change in the assumed initial public offering price and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

We currently anticipate that we will use the net proceeds from this offering, together with our existing cash and cash equivalents, to advance the clinical development of AT-527 for the treatment of moderate COVID-19, AT-787 for the treatment of chronic HCV, AT-752 for the treatment of dengue, our RSV program, and the remainder, if any, for working capital and other general corporate purposes.

This expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve. We may also use a portion of the net proceeds to in-license, acquire, or invest in additional businesses, technologies, products or assets, although currently we have no specific agreements, commitments or understandings in this regard. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the net proceeds to be received upon the closing of this offering or the amounts that we will actually spend on the uses set forth above. Predicting the cost necessary to develop product candidates can be difficult and we anticipate that we will need additional funds to complete the development of any product candidates we identify. The amounts and timing of our actual expenditures and the extent of clinical development may vary significantly depending on numerous factors, including the progress of our development efforts, the status of and results from our ongoing clinical trial(s) or any clinical trials we may commence in the future, as well as any collaborations that we may enter into with third parties for our product candidates and any unforeseen cash needs. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering, and investors will be relying on our judgment regarding the application of the net proceeds.

Based on our planned use of the net proceeds from this offering and our current cash and cash equivalents, we estimate that such funds will be sufficient to enable us to fund our operating expenses and capital expenditure requirements through . We have based this estimate on assumptions that may prove to be incorrect, and we could use our available capital resources sooner than we currently expect. We may satisfy our future cash needs through the sale of equity securities, debt financings, working capital lines of credit, corporate collaborations or license agreements, grant funding, interest income earned on invested cash balances or a combination of one or more of these sources. See "Management's Discussion and Analysis of Financial Condition and Results of Operation—Liquidity and Capital Resources—Future Funding Requirements" and "Risk Factors—Risks Related to Our Financial Condition and Capital Requirement."

Pending our use of the net proceeds from this offering, we intend to invest the net proceeds in a variety of capital preservation investments, including short-term and intermediate-term, investment-grade, interest-bearing instruments and U.S. government securities.

DIVIDEND POLICY

We have never declared or paid any cash dividends on our capital stock. We currently intend to retain all available funds and future earnings, if any, for the development, operation and expansion of our business and do not anticipate declaring or paying any dividends in the foreseeable future. The payments of dividends, if any, will be at the discretion of our board of directors and will depend on our financial condition, results of operations, capital requirements, business prospects, contractual arrangements, any limitations on payment of dividends present in our future debt agreements and other factors that our board of directors may deem relevant, and will be subject to the restrictions contained in any future financing instruments.

CAPITALIZATION

The following table sets forth our cash and cash equivalents and total capitalization as of June 30, 2020, as follows:

- on an actual basis;
- on a pro forma basis to give effect to (i) the Series D-1 Closing, (ii) the Roche Upfront Payment and (iii) the conversion of all outstanding shares of our convertible preferred stock into an aggregate of 57,932,090 shares of common stock in connection with the closing of this offering and the filing of our restated certificate of incorporation; and
- on a pro forma as adjusted basis to further reflect our issuance and sale of shares of common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The pro forma as adjusted information below is illustrative only, and our capitalization following the completion of this offering will be adjusted based on the actual initial public offering price and other terms of this offering determined at pricing. You should read this information in conjunction with our consolidated financial statements and the related notes appearing elsewhere in this prospectus, as well as the sections of this prospectus titled “Selected Consolidated Financial Data,” “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Description of Capital Stock.”

	As of June 30, 2020		
	Actual	Pro Forma	Pro Forma As Adjusted(1)
	(in thousands, except share and per share data) (unaudited)		
Cash and cash equivalents	$ 115,792	$ 573,292	
Convertible preferred stock, $0.001 par value per share; 57,932,090 shares authorized, 48,958,829 shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	$ 175,745	—	
Stockholders’ (deficit) equity:			
Preferred stock, $0.001 par value per share; no shares authorized, issued and outstanding, actual; shares authorized, no shares issued and outstanding, pro forma and pro forma as adjusted	—	—	
Common stock, $0.001 par value per share; 80,529,575 shares authorized, 10,309,847 shares issued and outstanding, actual; shares authorized, 68,241,937 shares issued and outstanding, pro forma; shares authorized, shares issued and outstanding, pro forma as adjusted	10	68	
Additional paid-in capital	5,057	288,244	
Accumulated deficit	(68,194)	(68,194)	
Total stockholders’ (deficit) equity	(63,127)	220,118	
Total capitalization	$ 112,618	220,118	

(1) Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, additional paid in capital, total stockholders’ equity (deficit) and total capitalization by $ million, assuming that the number of shares

offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase (decrease) of 1,000,000 shares in the number of shares offered by us at the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, additional paid in capital, total stockholders' equity (deficit) and total capitalization by approximately $ million.

The number of shares in the table above excludes the following:

- 4,186,747 shares of common stock issuable upon exercise of options outstanding under our Prior Plan to purchase shares of our common stock outstanding as of June 30 , 2020, at a weighted-average exercise price of $1.51 per share;
- shares of common stock reserved for future issuance under our 2020 Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of common stock reserved for future issuance under the 2020 Plan; and
- shares of common stock reserved for issuance under our 2020 ESPP, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of common stock reserved for future issuance under the 2020 ESPP.

DILUTION

If you invest in our common stock in this offering, your ownership interest will be diluted immediately to the extent of the difference between the initial public offering price per share of our common stock and the pro forma as adjusted net tangible book value per share of our common stock immediately after this offering.

Our historical net tangible book deficit as of June 30, 2020 was $(64.3) million, or $(6.23) per share of our common stock. Our historical net tangible book value (deficit) is the amount of our total tangible assets (total assets less deferred offering costs) less our total liabilities and convertible preferred stock, which is not included within our stockholders' (deficit) equity. Historical net tangible book value per share represents historical net tangible book value (deficit) divided by the number of shares of our common stock outstanding as of June 30, 2020.

Our pro forma net tangible book value as of June 30, 2020 was $219.0 million, or $3.21 per share of our common stock. Pro forma net tangible book value (deficit) represents the amount of our total tangible assets less our total liabilities, after giving effect to (i) the Series D-1 Closing, (ii) the Roche Upfront Payment and (iii) the automatic conversion of all of the shares of our convertible preferred stock outstanding into an aggregate of 57,932,090 shares of common stock upon the completion of this offering. Pro forma net tangible book value per share represents pro forma net tangible book value divided by the total number of shares outstanding as of June 30, 2020, after giving effect to the pro forma adjustments described above.

After giving further effect to receipt of the net proceeds from our issuance and sale of shares of common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of June 30, 2020 would have been $ million, or $ per share. This represents an immediate increase in pro forma as adjusted net tangible book value per share of $ to our existing stockholders and an immediate dilution in pro forma as adjusted net tangible book value per share of $ to new investors purchasing common stock in this offering. Dilution per share to new investors purchasing common stock in this offering is determined by subtracting pro forma as adjusted net tangible book value per share after this offering from the initial public offering price per share paid by new investors.

The following table illustrates this dilution on a per share basis:

Assumed initial public offering price per share		$
Historical net tangible book value (deficit) per share as of June 30, 2020	$(6.23)	
Increase per share attributable to the pro forma adjustments described above	9.44	
Pro forma net tangible book value (deficit) per share as of June 30, 2020	3.21	
Increase in pro forma as adjusted net tangible book value per share attributable to new investors purchasing shares in this offering		
Pro forma as adjusted net tangible book value per share after this offering		$
Dilution per share to new investors purchasing shares in this offering		$

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted net tangible book value per share after this offering by $ million, and dilution in pro forma net tangible book value per share to new investors by $, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each

increase (decrease) of 1,000,000 shares in the number of shares offered by us would increase (decrease) our pro forma as adjusted net tangible book value per share after this offering by $ per share and decrease (increase) the dilution to new investors by $ per share, assuming that the assumed initial public offering price remains the same, and after deducting the estimated underwriting discounts and commissions and the estimated offering expenses payable by us.

If the underwriters exercise their option to purchase additional shares of common stock in this offering in full, the pro forma as adjusted net tangible book value per share after this offering would be $ per share, and the dilution in pro forma as adjusted net tangible book value per share to new investors purchasing common stock in this offering would be $ per share, in each case assuming an initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The following table summarizes, on a pro forma as adjusted basis, as of June 30, 2020, the number of shares of common stock purchased from us on an as-converted to common stock basis, the total consideration paid, or to be paid and the weighted-average price per share paid, or to be paid, by existing stockholders and by new investors in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, before deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

	Shares Purchased		Total Consideration		Weighted-Average Price Per Share
	Number	Percent	Amount	Percent	
Existing stockholders before this offering		%	$	%	$
Investors participating in this offering					$
Total		100%	$	100%	

A $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease the total consideration paid by new investors by $ million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by percentage points and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by percentage points, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. An increase or decrease of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase or decrease the total consideration paid by new investors by $ million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by percentage points and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by percentage points, assuming no change in the assumed initial public offering price.

The table above assumes no exercise of the underwriters' option to purchase additional shares in this offering and no purchase of shares by any existing stockholders in this offering. If the underwriters' option to purchase additional shares is exercised in full, the number of shares of our common stock held by existing stockholders would be reduced to approximately % of the total number of shares of our common stock outstanding after this offering, and the number of shares of common stock held by new investors participating in the offering would be increased to approximately % of the total number of shares outstanding after this offering.

The above tables and discussion exclude the following:

- 4,186,747 shares of common stock issuable upon exercise of options outstanding under our Prior Plan to purchase shares of our common stock outstanding as of June 30, 2020, at a weighted-average exercise price of $1.51 per share;
- shares of common stock reserved for future issuance under our 2020 Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of common stock reserved for future issuance under the 2020 Plan; and
- shares of common stock reserved for issuance under our 2020 ESPP, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of common stock reserved for future issuance under the 2020 ESPP.

To the extent that any outstanding options are exercised or new options are issued under the equity benefit plans, or we issue additional shares of common stock or other securities convertible into or exercisable or exchangeable for shares of our capital stock in the future, there will be further dilution to investors participating in this offering.

SELECTED CONSOLIDATED FINANCIAL DATA

The following tables summarize our selected consolidated financial data for the periods and as of the dates indicated. We have derived our selected consolidated statements of operations and comprehensive loss data for the years ended December 31, 2019 and 2018 (except for the pro forma net loss per share and the pro forma share information), and the consolidated balance sheet data as of December 31, 2019 and 2018, from our audited consolidated financial statements and related notes included elsewhere in this prospectus. The consolidated statements of operations data for the six months ended June 30, 2020 and 2019 and the consolidated balance sheet data as of June 30, 2020 are derived from our unaudited consolidated financial statements included elsewhere in this prospectus and have been prepared on the same basis as the audited consolidated financial statements. In the opinion of management, the unaudited data reflects all adjustments, consisting only of normal recurring adjustments, necessary for a fair statement of the financial information in those statements. Our historical results are not necessarily indicative of the results that may be expected in the future, and our results for any interim period are not necessarily indicative of results that may be expected for any full year. You should read the financial and other data below in conjunction with the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and related notes included elsewhere in this prospectus.

	Six Months Ended June 30,		Years Ended December 31,	
	2020	2019	2019	2018
	(in thousands, except share and per share amounts) (unaudited)			
Statement of Operations and Comprehensive Loss Data				
Operating expenses:				
Research and development	$ 10,576	$ 4,270	$ 10,170	$ 6,675
General and administrative	3,472	1,820	4,438	2,802
Total operating expenses	14,048	6,090	14,608	9,477
Loss from operations	(14,048)	(6,090)	(14,608)	(9,477)
Interest income and other, net	67	343	574	413
Net loss and comprehensive loss	$ (13,981)	$ (5,747)	$ (14,034)	$ (9,064)
Net loss per share attributable to common stockholders - basic and diluted(1)	$ (1.39)	$ (0.57)	$ (1.39)	$ (0.90)
Weighted-average common shares outstanding - basic and diluted(1)	10,093,689	10,091,100	10,091,100	10,039,392
Pro forma net loss per share attributable to common stockholders - basic and diluted (unaudited)(2)	$ (0.30)		$ (0.32)	
Pro forma weighted-average common shares outstanding - basic and diluted (unaudited)(2)	47,292,517		43,736,547	

(1) For details on the calculation of our basic and diluted net loss per share attributable to common stockholders see Notes 10 and 11 to our unaudited and audited consolidated financial statements, respectively, included elsewhere in this prospectus.

(2) For details on the calculation of our pro forma basic and diluted net loss per share attributable to common stockholders see Notes 10 and 11 to our unaudited and audited consolidated financial statements, respectively, included elsewhere in this prospectus.

	As of June 30, 2020	As of December 31, 2019	2018
	(unaudited)	(in thousands)	
Balance Sheet Data			
Cash and cash equivalents	$ 115,792	$ 21,661	$ 34,492
Working capital(1)	111,392	19,475	32,938
Total assets	119,745	22,073	34,861
Total liabilities	7,127	2,530	1,908
Convertible preferred stock	175,745	69,114	69,114
Accumulated deficit	(68,194)	(54,213)	(40,179)
Total stockholders' deficit	(63,127)	(49,571)	(36,161)

(1) We define working capital as current assets less current liabilities.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our financial statements and the related notes to those statements included elsewhere in this prospectus. In addition to historical financial information, the following discussion and analysis contains forward-looking statements that involve risks, uncertainties and assumptions. Our actual results and timing of selected events may differ materially from those anticipated in these forward-looking statements as a result of many factors, including those discussed under "Risk Factors" and elsewhere in this prospectus. See "Special Note Regarding Forward-Looking Statements."

Overview

We are a clinical stage biopharmaceutical company focused on discovering, developing and commercializing antiviral therapeutics to improve the lives of patients suffering from life threatening viral infections. Leveraging our deep understanding of antiviral drug development, nucleoside biology, and medicinal chemistry, we have built a proprietary purine nucleotide prodrug platform to develop novel product candidates to treat single stranded ribonucleic acid viruses, which are a prevalent cause of severe viral diseases. Currently, we are focused on the development of orally available, potent, and selective nucleotide prodrugs for difficult to treat, life-threatening viral infections, including SARS-CoV-2, the virus that causes COVID-19, HCV, dengue virus, and RSV.

Since our formation in July 2012, we have devoted substantially all of our resources to developing our product candidates. We have incurred significant operating losses to date. Our net loss was $14.0 million and $9.1 million for the years ended December 31, 2019 and 2018, respectively. Our net loss was $14.0 million for the six months ended June 30, 2020. As of June 30, 2020, we had an accumulated deficit of $68.2 million. We expect that our operating expenses will increase significantly as we advance our product candidates through preclinical and clinical development, seek regulatory approval, and prepare for and, if approved, proceed to commercialization; acquire, discover, validate and develop additional product candidates; obtain, maintain, protect and enforce our intellectual property portfolio; and hire additional personnel. In addition, upon the completion of this offering, we expect to incur additional costs associated with operating as a public company.

We do not have any product candidates approved for sale and have not generated any revenue since inception. We have funded our operations primarily from the sale and issuance of convertible preferred stock. As of June 30, 2020, we had cash and cash equivalents of $115.8 million. We believe that our available cash and cash equivalents will be sufficient to fund our planned operations through .

Our ability to generate product revenue will depend on the successful development, regulatory approval and eventual commercialization of one or more of our product candidates. Until such time as we can generate significant revenue from product sales, if ever, we expect to finance our operations through private or public equity or debt financings, collaborative or other arrangements with corporate sources, or through other sources of financing. Adequate funding may not be available to us on acceptable terms, or at all. If we fail to raise capital or enter into such agreements as and when needed, we may have to significantly delay, scale back or discontinue the development and commercialization of our product candidates.

We plan to continue to use third-party service providers, including CROs and CMO, to carry out our preclinical and clinical development and to manufacture and supply the materials to be used during the development and commercialization of our product candidates.

We expect to continue to incur significant expenses and operating losses over the next several years. We anticipate that our expenses will increase significantly in connection with our ongoing activities, as we:

- continue clinical development of AT-527 for the treatment of COVID-19;

- re-initiate clinical development of AT-787 for the treatment of HCV;
- continue IND-enabling activities and commence the planned clinical development activities for product candidates for the treatment of dengue;
- continue activities to discover, validate and develop product candidates for the treatment of RSV;
- maintain, expand, protect and enforce our intellectual property portfolio;
- hire additional research, development and general and administrative personnel; and
- incur additional costs associated with operating as a public company upon the closing of this offering.

Components of Results of Operations

Revenue

We have not generated any revenue from product sales and do not expect to generate any revenue from the sale of products in the near future. If our development efforts for our product candidates are successful and result in commercialization, we may generate revenue in the future from a combination of product sales or payments from collaboration or license agreements that we may enter into with third parties.

Operating Expenses

Research and Development Expenses

Substantially all of our research and development expenses consist of expenses incurred in connection with the development of our product candidates. These expenses include fees paid to third parties to conduct certain research and development activities on our behalf, consulting costs, certain payroll and personnel-related expenses, including salaries and bonuses, employee benefit costs and stock-based compensation expenses for our research and product development employees and allocated overhead, including rent, equipment, depreciation, information technology costs and utilities attributable to research and development personnel. We expense both internal and external research and development expenses as they are incurred. In circumstances where amounts have been paid in advance or in excess of costs incurred, we record a prepaid expense, which is expensed as services are performed or goods are delivered.

A significant portion of our research and development costs have been external costs, which we track by therapeutic area. Our internal research and development costs are primarily personnel-related costs, facility costs, including depreciation and lab consumables. We have not historically tracked our internal research and development expenses by therapeutic area basis as they are deployed across multiple programs. The following table summarizes our external research and development expenses by indication and internal research and development expenses:

	Six Months Ended June 30,		Years Ended December 31,	
	2020	2019	2019	2018
	(in thousands)			
HCV external costs	$ 1,683	$ 2,353	$ 5,837	$ 2,979
COVID-19 external costs	5,487	—	—	—
Dengue external costs	1,049	207	768	297
RSV external costs	660	656	1,379	1,790
Internal research and development costs	1,697	1,054	2,186	1,609
Total research and development costs	$ 10,576	$ 4,270	$ 10,170	$ 6,675

We are focusing substantially all of our resources on the development of our product candidates, particularly AT-527. We expect our research and development expenses to increase substantially following this offering and for at least the next few years, as we seek to initiate additional clinical trials for our product candidates, complete our clinical programs, pursue regulatory approval of our product candidates and prepare for the possible commercialization of these product candidates. Predicting the timing or cost to complete our clinical programs or validation of our commercial manufacturing and supply processes is difficult and delays may occur because of many factors, including factors outside of our control. For example, if the FDA or other regulatory authorities were to require us to conduct clinical trials beyond those that we currently anticipate, we could be required to expend significant additional financial resources and time on the completion of clinical development. Furthermore, we are unable to predict when or if our product candidates will receive regulatory approval with any certainty.

General and Administrative Expenses

General and administrative expenses consist principally of payroll and personnel expenses, including salaries and bonuses, benefits and stock-based compensation expenses, professional fees for legal, consulting, accounting and tax services, allocated overhead, including rent, equipment, depreciation, information technology costs and utilities, and other general operating expenses not otherwise classified as research and development expenses.

We anticipate that our general and administrative expenses will increase as a result of increased personnel costs, expanded infrastructure and higher consulting, legal and accounting services costs associated with complying with Nasdaq and SEC requirements, investor relations costs and director and officer insurance premiums associated with being a public company.

Interest Income and Other, Net

Interest income and other, net, consists primarily of interest income earned on our cash and cash equivalents.

Results of Operations

Comparison of the Six Months Ended June 30, 2020 and 2019

The following table summarizes our results of operations for the periods indicated:

	Six Months Ended June 30,		
	2020	2019	Change
	(in thousands)		
Operating expenses:			
Research and development	$ 10,576	$ 4,270	$ 6,306
General and administrative	3,472	1,820	1,652
Total operating expenses	14,048	6,090	7,958
Loss from operations	(14,048)	(6,090)	(7,958)
Interest income and other, net	67	343	(276)
Net loss	$ (13,981)	$ (5,747)	$ (8,234)

Research and Development Expenses

Research and development expenses increased by $6.3 million from $4.3 million for the six months ended June 30, 2019 to $10.6 million for the six months ended June 30, 2020. The increase in research and

development expenses was primarily due to the advancement of product candidates for the treatment of COVID-19 and dengue and reflected an increase in expenses incurred related to CRO and CMO services of $5.7 million and a $0.6 million increase in consulting, payroll and personnel-related expenses, including salaries and bonuses, benefits and stock-based compensation expense for our research and product development employees.

General and Administrative Expenses

General and administrative expenses increased by $1.7 million from $1.8 million for the six months ended June 30, 2019 to $3.5 million for the six months ended June 30, 2020. The increase in general and administrative expenses was primarily due to the expansion of our organization and reflected an increase in professional fees of $1.1 million; payroll and personnel- related expenses, including salaries, benefits and stock-based compensation expense, of $0.3 million; a license termination fee of $0.2 million; and an increase in other general and administrative expenses $0.1 million.

Interest Income and Other, Net

Interest income and other, net, decreased by $0.3 million for the six months ended June 30, 2020 compared to the six months ended June 30, 2019, primarily due to lower average cash and cash equivalents balances and lower interest rates.

Comparison of the Years Ended December 31, 2019 and 2018

The following table summarizes our results of operations for the periods indicated:

	Years Ended December 31,		
	2019	2018	Change
	(in thousands)		
Operating expenses:			
Research and development	$ 10,170	$ 6,675	$ 3,495
General and administrative	4,438	2,802	1,636
Total operating expenses	14,608	9,477	5,131
Loss from operations	(14,608)	(9,477)	(5,131)
Interest income and other, net	574	413	161
Net loss	$ (14,034)	$ (9,064)	$ (4,970)

Research and Development Expenses

Research and development expenses increased by $3.5 million from $6.7 million for the year ended December 31, 2018 to $10.2 million for the year ended December 31, 2019. The increase in research and development expenses was primarily due to the advancement of preclinical, manufacturing and clinical expense of $2.9 million related to product candidates for the treatment of HCV and an increase of $0.5 million in consulting, payroll and personnel-related expenses, including salaries and bonuses, benefits and stock-based compensation expense.

General and Administrative Expenses

General and administrative expenses increased by $1.6 million from $2.8 million for the year ended December 31, 2018 to $4.4 million for the year ended December 31, 2019. The increase in general and administrative expenses was primarily due to the expansion of our organization and reflected an increase of $0.5 million in payroll and personnel-related expenses, including salaries, benefits and stock-based compensation expense; and an increase in other general and administrative expenses, including legal and accounting of $1.1 million.

Interest Income and Other, Net

Interest income and other, net increased by $0.2 million for year ended December 31, 2019 from the year ended December 31, 2018 due higher average cash and cash equivalent balances during the year.

Liquidity and Capital Resources

Sources of Liquidity

Since our formation in 2012 through June 30, 2020, we have funded our operations with an aggregate of $178.1 million in gross cash proceeds from the sale of convertible preferred stock. As of June 30, 2020, we had cash and cash equivalents of $115.8 million. The Series D investors were obligated to purchase $35.8 million of Series D-1 convertible preferred stock upon the achievement of a clinical development milestone as defined in the agreement. In addition, the investors have the option to purchase up to $71.7 million of Series D-1 convertible preferred stock following the aforementioned clinical development milestone and receipt of certain additional preclinical data. Unless previously exercised, the option to purchase the shares of Series D-1 convertible preferred stock would terminate (i) eight days after the filing of the registration statement relating to this offering or (ii) in the event that the clinical development milestone discussed above occurs after the filing of the registration statement relating to this offering and prior to the consummation of the offering, upon the consummation of the offering. In October 2020, the Series D investors exercised their right and purchased the fully authorized 8,973,261 shares of the Series D-1 convertible preferred stock at a purchase price of $11.98 per share for an aggregate purchase price of $107.5 million.

In addition, the Company expects to receive the $350 million Roche Upfront Payment in November 2020.

Future Funding Requirements

We have incurred net losses since our inception. For the years ended December 31, 2019 and 2018, we incurred net losses of $14.0 million and $9.1 million, respectively. For the six months ended June 30, 2020 we incurred a net loss of $14.0 million and expect to incur substantial additional losses in future periods. As of June 30, 2020, we had an accumulated deficit of $68.2 million. Based on our current business plan, we believe that our existing cash and cash equivalents will be sufficient to fund our planned operations into .

To date, we have not generated any revenue. We do not expect to generate any meaningful revenue unless and until we obtain regulatory approval of and commercialize any of our product candidates or enter into collaborative agreements with third parties, and we do not know when, or if, either will occur. We expect to continue to incur significant losses for the foreseeable future, and we expect the losses to increase as we continue the development of, and seek regulatory approvals for, our product candidates and begin to commercialize any approved products. We are subject to all of the risks typically related to the development of new product candidates, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. Moreover, following the completion of this offering, we expect to incur additional costs associated with operating as a public company.

We will continue to require additional capital to develop our product candidates and fund operations for the foreseeable future. We may seek to raise capital through private or public equity or debt financings, collaborative or other arrangements with corporate sources, or through other sources of financing. We anticipate that we will need to raise substantial additional capital, the requirements for which will depend on many factors, including:

- the scope, timing, rate of progress and costs of our drug discovery efforts, preclinical development activities, laboratory testing and clinical trials for our product candidates;
- the number and scope of clinical programs we decide to pursue;

- the cost, timing and outcome of preparing for and undergoing regulatory review of our product candidates;
- the scope and costs of development and commercial manufacturing activities;
- the cost and timing associated with commercializing our product candidates, if they receive marketing approval;
- the extent to which we acquire or in-license other product candidates and technologies;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- our ability to establish and maintain collaborations on favorable terms, if at all;
- our efforts to enhance operational systems and our ability to attract, hire and retain qualified personnel, including personnel to support the development of our product candidates and, ultimately, the sale of our products, following regulatory approval;
- our implementation of operational, financial and management systems; and
- the costs associated with being a public company.

A change in the outcome of any of these or other variables with respect to the development of any of our product candidates could significantly change the costs and timing associated with the development of that product candidate. Furthermore, our operating plans may change in the future, and we will continue to require additional capital to meet operational needs and capital requirements associated with such operating plans. If we raise additional funds by issuing equity securities, our stockholders may experience dilution. Any future debt financing into which we enter may impose upon us additional covenants that restrict our operations, including limitations on our ability to incur liens or additional debt, pay dividends, repurchase our common stock, make certain investments or engage in certain merger, consolidation or asset sale transactions. Any debt financing or additional equity that we raise may contain terms that are not favorable to us or our stockholders.

Adequate funding may not be available to us on acceptable terms or at all. Our failure to raise capital as and when needed could have a negative impact on our financial condition and our ability to pursue our business strategies. If we are unable to raise additional funds when needed, we may be required to delay, reduce, or terminate some or all of our development programs and clinical trials or we may also be required to sell or license to others rights to our product candidates in certain territories or indications that we would prefer to develop and commercialize ourselves. If we are required to enter into collaborations and other arrangements to supplement our funds, we may have to give up certain rights that limit our ability to develop and commercialize our product candidates or may have other terms that are not favorable to us or our stockholders, which could materially affect our business and financial condition.

See the section of this prospectus titled “Risk Factors” for additional risks associated with our substantial capital requirements.

Summary Statement of Cash Flows

The following table sets forth the primary sources and uses of cash, cash equivalents, and restricted cash for each of the periods presented below:

	Six Months Ended June 30,		Years Ended December 31,	
	2020	2019	2019	2018
	(in thousands)			
Net cash (used in) provided by:				
Operating activities	$ (12,306)	$(5,207)	$ (12,814)	$ (7,908)
Investing activities	(6)	—	(2)	(12)
Financing activities	106,443	—	(15)	27,483
Net increase (decrease) in cash, cash equivalents and restricted cash	$ 94,131	$(5,207)	$ (12,831)	$ 19,563

Cash Flows from Operating Activities

Net cash used in operating activities was $12.3 million for the six months ended June 30, 2020. Cash used in operating activities was primarily due to the use of funds in our operations to develop our product candidates, resulting in a net loss of $14.0 million, offset by stock based compensation of $0.4 million. Additional uses of cash during the period included an increase in prepaid expenses and other current assets of $2.4 million offset by an increase in accounts payable and accrued expenses of $3.7 million.

Net cash used in operating activities was $5.2 million for the six months ended June 30, 2019. Cash used in operating activities was primarily due to the use of funds in our operations to develop our product candidates resulting in a net loss of $5.7 million, offset by stock based compensation of $0.3 million. Additional uses of cash during the period included an increase in accounts payable and accrued expenses of $0.2 million.

Net cash used in operating activities was $12.8 million for the year ended December 31, 2019. Cash used in operating activities was primarily due to the use of funds in our operations to develop our product candidates resulting in a net loss of $14.0 million, offset by stock based compensation of $0.6 million and increases in accounts payable and accrued expenses of $0.6 million.

Net cash used in operating activities was $7.9 million for the year ended December 31, 2018. Cash used in operating activities was primarily due to the use of funds in our operations to develop our product candidates resulting in a net loss of $9.1 million, offset by stock based compensation of $0.4 million and increases and accrued expenses of $0.7 million.

Cash Flows from Financing Activities

Net cash provided by financing activities was $106.4 million for the six months ended June 30, 2020, which consisted primarily of $106.6 million of net proceeds from the sale of Series D convertible preferred stock partially offset by payment of deferred offering costs of $0.2 million.

Net cash provided by financing activities was $27.5 million for the year ended December 31, 2018, which consisted primarily of $27.4 million of net proceeds from the sale of Series C convertible preferred stock.

Contractual Obligations and Commitments

We lease our office space under a non-cancelable operating lease in Boston, Massachusetts, that expires in July 2022. The following table summarizes our contractual obligations as of December 31, 2019:

	Payments Due by Period				
	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years	Total
	(in thousands)				
Operating lease obligations	$ 335	$ 540	$ —	$ —	$ 875

We enter into contracts in the normal course of business with third-party contract organizations for preclinical and clinical studies and testing, manufacture and supply of our preclinical materials and other services and products used for operating purposes. These contracts do not contain any minimum purchase commitments and generally provide for termination following a certain period after notice, and therefore we believe that our non-cancelable obligations under these agreements are not material. Payments due upon cancelation consist only of payments for services provided and expenses incurred up to the date of cancelation.

The table above also does not include potential milestone and success fees that we may be required to pay under agreements we have entered into with certain consultants. We have an agreement with a consultant that requires payment of a success fee of up to a maximum of $1.75 million if a business development transaction that meets or exceeds certain thresholds is executed on or before December 31, 2020. We also have an agreement with a consultant that requires payment of a success fee calculated as a percentage of certain product sales, subject to a cumulative maximum payout of $5.0 million. We have not included such potential obligations in the table above because they are contingent upon the occurrence of future events and the timing and likelihood of such potential obligations are not known with certainty.

Critical Accounting Policies, Significant Judgments and Use of Estimates

Our financial statements have been prepared in accordance with U.S. generally accepted accounting principles, or GAAP. The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the reported expenses incurred during the reporting periods. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. We believe that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management’s judgments and estimates.

Accrued Research and Development

We have entered into various agreements with CMOs and CROs. Our research and development accruals are estimated based on the level of services performed, progress of the studies, including the phase or completion of events, and contracted costs. The estimated costs of research and development provided, but not yet invoiced, are included in accrued liabilities on the balance sheet. If the actual timing of the performance of services or the level of effort varies from the original estimates, we will adjust the accrual accordingly. Payments made to CMOs and CROs under these arrangements in advance of the performance of the related services are recorded as prepaid expenses and other current assets until the services are rendered. Although we do not expect our estimates to be materially different from amounts actually incurred, our understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in reporting amounts that are too high or too low in any particular period. To date, there have not been any material adjustments to our prior estimates of accrued research and development expenses.

Stock-Based Compensation

We use a fair value-based method to account for all stock-based compensation arrangements with employees and non-employees, including stock options and stock awards. The fair value of the option granted is recognized on a straight-line basis over the period during which an optionee is required to provide services in exchange for the option award, known as the requisite service period, which usually is the vesting period. In determining fair value of the stock options granted, we use the Black–Scholes model, which requires the input of subjective assumptions. These assumptions include: estimating the fair market value of the common stock, estimating the length of time employees will retain their vested stock options before exercising them (expected term), the estimated volatility of our common stock price over the expected term (expected volatility), risk-free interest rate and expected dividends. See Note 9 to our audited and unaudited consolidated financial statements included elsewhere in this prospectus for information concerning certain of the specific assumptions we used in applying the Black-Scholes option pricing model to determine the estimated fair value of our stock options granted during the six months ended June 30, 2020 and the years ended December 31, 2019 and 2018, respectively. Estimating the fair value of our common stock involves significant judgement and the use of estimates.

Estimating the Fair Value of Common Stock

We are required to estimate the fair value of the common stock underlying our share-based awards when performing the fair value calculations using the Black-Scholes option pricing model. Because our common stock is not currently publicly traded, the fair value of the common stock underlying our stock options has been determined on each grant date by our board of directors, with input from management, considering the most recently available third-party valuation of our common shares. All options to purchase shares of our common stock are intended to be granted with an exercise price per share no less than the estimated fair value per share of our common stock underlying those options on the date of grant, based on the information known to us on the date of grant.

In the absence of a public trading market for our common stock, on each grant date, we develop an estimate of the fair value of our common stock based on valuations from an independent third-party valuation firm using information known to us on the date of grant, a review of any recent events and their potential impact on the estimated fair value per share of the common stock.

The third-party valuations of our common stock were determined in accordance with the guidelines outlined in the American Institute of Certified Public Accountants Practice Aid, Valuation of Privately-Held-Company Equity Securities Issued as Compensation, or the Practice Aid.

The assumptions used to determine the estimated fair value of our common stock are based on numerous objective and subjective factors, combined with management judgment, including:

- external market conditions affecting the pharmaceutical and biotechnology industry and trends within the industry;
- our stage of development and business strategy;
- the rights, preferences and privileges of our redeemable convertible preferred stock relative to those of our common stock;
- the prices at which we sold shares of our redeemable convertible preferred stock;
- our financial condition and operating results, including our levels of available capital resources;
- the progress of our research and development efforts;
- equity market conditions affecting comparable public companies; and
- general U.S. market conditions and the lack of marketability of our common stock.

The Practice Aid identifies various available methods for allocating enterprise value across classes and series of capital stock to determine the estimated fair value of common stock at each valuation date. In accordance with the Practice Aid, we considered the following methods:

- *Option Pricing Method.* Under the option pricing method, or OPM, shares are valued by creating a series of call options with exercise prices based on the liquidation preferences and conversion terms of each equity class. The estimated fair values of the preferred and common stock are inferred by analyzing these options.
- *Probability-Weighted Expected Return Method.* The probability-weighted expected return method, or PWERM, is a scenario-based analysis that estimates value per share based on the probability-weighted present value of expected future investment returns, considering each of the possible outcomes available to us, as well as the economic and control rights of each share class.

Based on our early stage of development and other relevant factors, we determined that OPM method as well as a hybrid approach of the OPM and the PWERM methods were the most appropriate methods for allocating our enterprise value to determine the estimated fair value of our common stock. In determining the estimated fair value of our common stock, our board of directors also considered the fact that our stockholders could not freely trade our common stock in the public markets. Accordingly, we applied discounts to reflect the lack of marketability of our common stock based on the weighted-average expected time to liquidity. The estimated fair value of our common stock at each grant date reflected a non-marketability discount partially based on the anticipated likelihood and timing of a future liquidity event.

Following the completion of this offering, the fair value of our common stock will be based on the closing quoted market price of our common stock.

The following table presents the grant dates, number of underlying shares of common stock and the per share exercise prices of stock options granted between January 1, 2018 and the date of this prospectus, along with the fair value per share utilized to calculate stock-based compensation:

Grant date	Number of shares	Exercise price of award per share[1]	Fair value of common stock per share on grant date	Per share estimated fair value of award[2]
April 6, 2018	75,000	$ 1.53	$ 1.53	$ 0.94
December 14, 2018	935,000	$ 1.43	$ 1.43	$ 0.71
July 31, 2019	116,891	$ 1.43	$ 1.43	$ 0.87
September 20, 2019	75,000	$ 1.43	$ 1.43	$ 0.66
December 13, 2019	899,742	$ 1.85	$ 1.85	$ 1.26
April 3, 2020	293,861	$ 1.57	$ 1.57	$ 1.08
August 3, 2020	1,490,000	$ 6.83	$ 6.83	$ 4.96
August 17, 2020	1,005,000	$ 6.84	$ 6.84	$ 5.08
August 26, 2020	620,000	$ 6.85	$ 6.85	$ 5.09
October 1, 2020	160,000	$ 8.02	$ 8.02	$ 5.98

(1) The exercise price of award per share represents the fair value of our common stock on the date of grant, as determined by our board of directors, after taking into account our most recently available contemporaneous valuation of our common stock

(2) The per share estimated fair value of award represents the weighted average fair value of options as estimated at the date of grant using the Black-Scholes option pricing model.

Off-Balance Sheet Arrangements

Since our inception, we have not engaged in any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

Indemnification Agreements

We enter into standard indemnification arrangements in the ordinary course of business. Pursuant to these arrangements, we indemnify, hold harmless and agree to reimburse the indemnified parties for losses suffered or incurred by the indemnified party, including in connection with any trade secret, copyright, patent or other intellectual property infringement claim by any third party with respect to its technology. The term of these indemnification agreements is generally perpetual any time after the execution of the agreement. The maximum potential amount of future payments we could be required to make under these arrangements is not determinable. We have never incurred costs to defend lawsuits or settle claims related to these indemnification agreements. As a result, we believe the fair value of these agreements is minimal.

We have also agreed to indemnify our directors and officers for certain events or occurrences while the director or officer is, or was serving, at our request in such capacity. The indemnification period covers all pertinent events and occurrences during the director's or officer's service. The maximum potential amount of future payments we could be required to make under these indemnification agreements is not specified in the **agreements; however, we have director and officer insurance coverage that reduces our exposure and enables us to recover a portion of any future amounts paid. We believe the estimated fair value of these indemnification agreements in excess of applicable insurance coverage is minimal.**

JOBS Act Accounting Election

The Jumpstart Our Business Startups Act of 2012 (JOBS Act) permits an "emerging growth company" such as us to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies. We have elected to avail ourselves of this exemption from new or revised accounting standards, and, therefore, will not be subject to the same new or revised accounting standards as public companies that are not emerging growth companies. We intend to rely on other exemptions provided by the JOBS Act, including without limitation, not being required to comply with the auditor attestation requirements of Section 404(b) of the Sarbanes-Oxley Act.

We will remain an emerging growth company until the earliest to occur of: (1) the last day of our first fiscal year in which we have total annual revenues of more than $1.07 billion; (2) the date we qualify as a "large accelerated filer," with at least $700.0 million of equity securities held by non-affiliates; (3) the date on which we have issued more than $1.0 billion in non-convertible debt securities during the prior three-year period; and (4) the last day of the fiscal year ending after the fifth anniversary of our initial public offering.

Recently Issued Accounting Pronouncements

See the section titled "Summary of Significant Accounting Policies—Recently Issued Accounting Pronouncements" in Note 2 to our consolidated financial statements included elsewhere in this prospectus for additional information.

Quantitative and Qualitative Disclosures about Market Risk

Interest Rate Sensitivity

The market risk inherent in our financial instruments and in our financial position represents the potential loss arising from adverse changes in interest rates or exchange rates. As of June 30, 2020, we had cash and cash equivalents of $115.8 million, consisting of interest-bearing money market funds for which the fair value would be affected by changes in the general level of U.S. interest rates. However, due to the short-term maturities and

the low-risk profile of our cash equivalents, an immediate 10% relative change in interest rates would not have a material effect on the fair value of our cash equivalents or on our future interest income.

We do not believe that inflation, interest rate changes or foreign currency exchange rate fluctuations have had a significant impact on our results of operations for any periods presented herein.

BUSINESS

Overview

We are a clinical-stage biopharmaceutical company focused on discovering, developing and commercializing antiviral therapeutics to improve the lives of patients suffering from life-threatening viral infections. Leveraging our deep understanding of antiviral drug development, nucleoside biology, and medicinal chemistry, we have built a proprietary purine nucleotide prodrug platform to develop novel product candidates to treat single stranded ribonucleic acid, or ssRNA, viruses, which are a prevalent cause of severe viral diseases. Currently, we are focused on the development of orally available, potent, and selective nucleotide prodrugs for difficult-to-treat, life-threatening viral infections, including severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2, the virus that causes COVID-19, hepatitis C virus, or HCV, dengue virus, and respiratory syncytial virus, or RSV. We believe our team's expertise from decades of developing innovative antiviral treatments uniquely positions us to advance medicines that have the potential to cure some of the world's most severe viral diseases by inhibiting the enzymes central to viral replication.

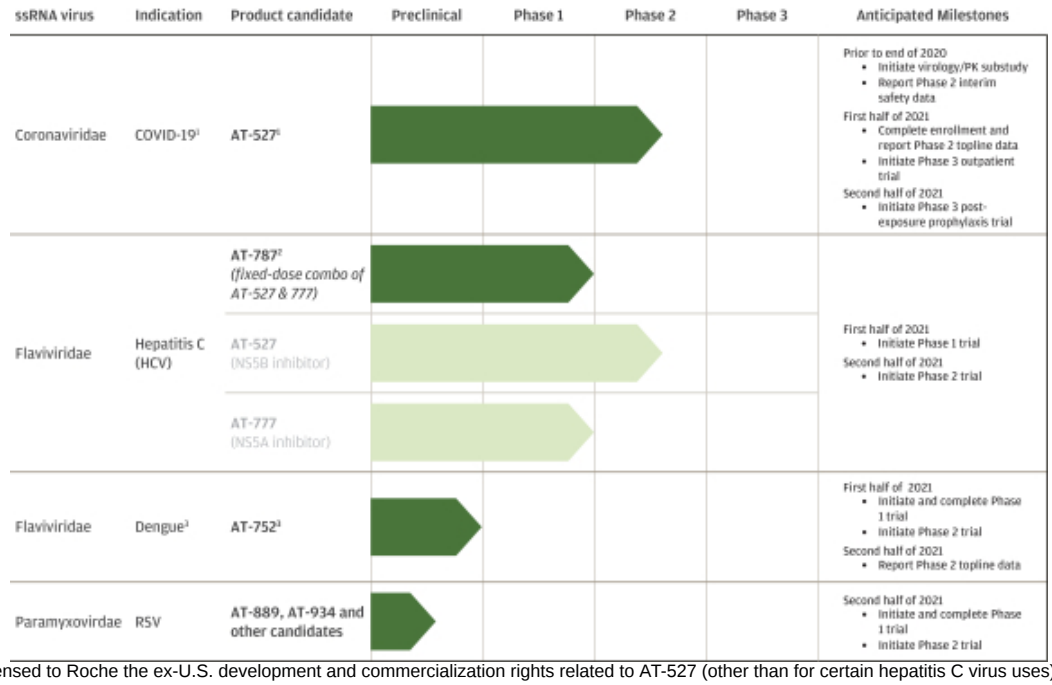
Over the last 40 years, nucleoside and nucleotide, or together, nucleos(t)ide, analogs have been developed to mimic naturally occurring nucleic acids and block viral replication by inhibiting enzymes involved in RNA and DNA viral growth cycles. Nucleos(t)ide analogs have become the backbone of therapies that treat life-threatening viral infections, including human immunodeficiency virus, or HIV, hepatitis B, or HBV, and HCV. Our expertise has allowed us to develop a proprietary platform, which facilitates the development of product candidates that combine unique purine nucleotide scaffolds with a novel double prodrug strategy. We believe that utilizing this double prodrug moiety approach allows us to maximize formation of the active metabolite, potentially resulting in oral antiviral product candidates that are selective for and highly effective at preventing replication of ssRNA viruses while avoiding toxicity to host cells. We have produced a large library of nucleoside and nucleotide prodrugs specifically designed to target viral RNA-dependent RNA polymerase, or RdRp, a key enzyme that is encoded in the viral genome. All ssRNA viruses, including SARS-CoV-2 and HCV, depend on RdRp for replication and transcription and, since viral RdRp is not present in the host cell, RdRp is an ideal target to inhibit virus replication.

Our lead product candidate, AT-527, is an orally administered, novel antiviral agent for the treatment of patients infected with SARS-CoV-2, which causes COVID-19. AT-527 has been shown to be well tolerated and highly effective against HCV in Phase 2 clinical trials with HCV-infected subjects and this highly selective antiviral activity has now been demonstrated *in vitro* against SARS-CoV-2. The RdRps in SARS-CoV-2 support the transcription and replication of the approximately 30,000-nucleotide RNA viral genome. The RdRps in SARS-CoV-2 and severe acute respiratory syndrome coronavirus 1, or SARS-CoV, the virus that causes severe acute respiratory disease, are the largest and most complex RdRps among RNA viruses. AT-527 was specifically designed as a purine nucleotide prodrug to inhibit viral RdRp and has shown *in vitro* activity in several assays against human coronaviruses, including SARS-CoV and SARS-CoV-2. We are currently evaluating AT-527 in a randomized, double blind, placebo-controlled Phase 2 trial in approximately 190 adult patients with moderate COVID-19 and one or more risk factors for poor outcomes. We dosed our first patient in September 2020 and expect to report topline data from this trial in the first half of 2021. We anticipate initiating a Phase 3 clinical trial to study AT-527 in adult patients with mild to moderate COVID-19 requiring outpatient management in the first half of 2021. In October 2020, we entered into the Roche License Agreement, granting Roche an exclusive license over the development and commercialization rights related to AT-527 outside of the United States (other than for certain hepatitis C virus uses). As part of the Roche License Agreement, we also granted Roche a license to manufacture AT-527 worldwide and agreed that Roche would manufacture the global commercial supply of AT-527. As part of the consideration, Roche agreed to pay us an upfront payment of $350 million. See "Roche License Agreement."

We are also developing additional small molecule antiviral product candidates for the treatment of HCV, dengue virus and RSV:

- For the treatment of chronic HCV infection, we have created a novel combination of AT-527 with AT-777, a nonstructural protein 5A, or NS5A, inhibitor into a single, oral, pan-genotypic fixed-dose combination product candidate, AT-787. Despite significant recent advances in treatment, HCV remains a global health burden due to the limitations of currently available treatment options. We believe that AT-787 has the potential to offer a short duration protease-sparing regimen for HCV-infected patients with or without cirrhosis. For patients with decompensated cirrhosis, a life-threatening stage of liver disease, AT-787 has the potential to treat these patients without the co-administration of ribavirin. Upon the resolution of industry wide clinical trial challenges associated with the COVID-19 pandemic, we expect to initiate our Phase 1/2A clinical trial, which is designed to evaluate the safety and pharmacokinetics, or PK, of different dosages of AT-777 in healthy adults and to evaluate the combination of AT-527 and AT-777 in HCV infected subjects.
- AT-752 is an oral, purine nucleotide prodrug for the treatment of dengue virus – a disease that infects up to 400 million people a year for which there are currently no therapies approved by either the U.S. Federal Food and Drug Administration, or the FDA, or European Medicines Agency, or EMA. AT-752 targets the inhibition of the dengue viral polymerase and, in preclinical studies, AT-752 showed potent *in vitro* activity against all serotypes tested as well as potent *in vivo* antiviral activity in a small animal model. We expect to initiate a randomized, double-blind, placebo-controlled Phase 1 trial to evaluate the safety and PK, of different dosages of AT-752 in healthy adults in the first half of 2021. Following the completion of the Phase 1 trial, we expect to initiate a Phase 2 trial to evaluate the antiviral activity, safety and PK of AT-752 in adult patients with dengue in the first half of 2021. Pursuant to the Roche License Agreement we retained rights to develop and manufacture AT-752 globally and to commercialize AT-752 in the United States for dengue, Japanese Encephalitis, West Nile virus, Yellow Fever and Zika. Rights to AT-752 for other indications were exclusively licensed to Roche. Roche agreed to negotiate in good faith an amendment to the Roche License Agreement pursuant to which Roche may commercialize AT-752 for dengue outside of the United States, unless Roche offers such commercialization right to us. Neither Roche nor we may commercialize AT-752 outside of the United States for dengue until we agree to an amendment to the Roche License Agreement. See “Roche License Agreement.”
- We are evaluating two lead compounds, AT-889 and AT-934, second-generation nucleoside pyrimidine prodrugs and other compounds for the treatment of RSV. AT-889 and AT-934 inhibit RNA polymerase through both initiation of viral replication and viral transcription and showed potent *in vitro* activity in several cell based assays against RSV. In the second half of 2021, we expect to file an IND or CTA and initiate clinical development of our selected product candidate.

All of our product candidates have been discovered and developed internally and we retain full global rights to commercialize our product candidates, other than certain ex-U.S. rights licensed to Roche under the license agreement we entered into with Roche in October 2020, or the Roche License Agreement. We retain the right to commercialize all our product candidates in the United States. The following table summarizes our orally administered product candidate pipeline.



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Our team

Our management team has significant experience discovering, developing and commercializing antiviral therapies for life-threatening viral infections. Our Founder, Chairman, and Chief Executive Officer, Jean-Pierre Sommadossi, Ph.D., has over 30 years of scientific, operational, strategic, and management experience in the biopharmaceutical industry, and holds more than 60 U.S. patents related to the treatment of infectious disease and cancer. Dr. Sommadossi was the principal founder of Idenix Pharmaceuticals, Inc., or Idenix, which was acquired by Merck & Co., Inc. in 2014, and a co-founder of Pharmasset, Inc., or Pharmasset, which was acquired by Gilead Sciences, Inc. in 2012.

We have assembled an experienced management and scientific team with a track record of success in the field of antiviral drug development, many of whom have worked together previously. Our team has significant expertise in nucleos(t)ide chemistry and biology and has applied that expertise towards the discovery and development of innovative antiviral treatments, including Epivir, Sovaldi, Tyzeka, Valtrex, Wellferon, Videx, Reyataz, Sustiva, Mavyret, Xofluza, Relenza and Zerit. Members of our team have held senior positions at AstraZeneca plc, GlaxoSmithKline plc, Chiron, Novartis International AG, Biogen, F. Hoffmann La Roche, Abbvie,

Bristol Myers Squibb, Shire, Biohaven Pharma, Pharmasset, Idenix, Valeant Pharmaceuticals International and Alnylam Pharmaceuticals.

We have been supported by a leading syndicate of investors, which include Adage, Aju IB Investment, Ally Bridge Group, Bain Capital Life Sciences, Cormorant Asset Management, Morningside Ventures, Omega Funds, Perceptive Advisors, PICTET, RA Capital, Redmile Group, RMI Partners, Rock Springs Capital, Sectoral Asset Management, T. Rowe Price and Valence Life Sciences.

Our strategy

Our goal is to become a global leader in the discovery, development, and commercialization of novel antiviral therapies for severe or life-threatening viral infections. We intend to achieve this goal by pursuing the following strategies:

- ***Rapidly complete development and obtain approval for our lead product candidate, AT-527, an oral drug for the treatment of COVID-19***. We are currently evaluating AT-527 in a randomized, double-blind, placebo-controlled Phase 2 trial in approximately 190 adult patients with moderate COVID-19 and one or more risk factors for poor outcomes. We dosed the first patient in September 2020 and expect to report topline data from this trial in the first half of 2021. We intend to initiate a AT-527 Phase 3 trial enrolling patients with mild to moderate COVID-19 requiring outpatient management in the first half of 2021. We intend to work closely with the FDA and other regulatory authorities as we plan and implement our clinical trials to align on the most efficient regulatory pathway and may seek expedited development review programs such as Breakthrough Therapy designation.
- ***Deploy our medicinal chemistry expertise and proprietary purine nucleotide platform against severe ssRNA viruses with high unmet need.*** We are also developing additional small molecule antiviral product candidates for the treatment of HCV, dengue virus and RSV. We are developing AT-787, a co-formulated, oral, pan-genotypic fixed dose combination of AT-527 and AT-777, for the treatment of HCV. We believe AT-787 has the potential to shorten treatment duration compared to existing therapies, cure difficult-to-treat populations not currently served by existing therapies, and eliminate the need for ribavirin in patients suffering from decompensated cirrhosis. We are also developing AT-752 for the treatment of dengue virus, which we believe has the potential to be the first approved treatment for dengue fever – a disease that infects up to 400 million people each year. Finally, we are developing AT-889 and AT-934, second-generation nucleoside pyrimidine prodrugs, and other compounds for the treatment of RSV. We believe that the product candidate we develop could be the first therapy in over 30 years to be approved specifically for the treatment of RSV.
- ***Focus on excellent clinical and regulatory execution.*** We believe that building a successful antiviral-focused company requires very specific expertise in the areas of clinical study design and conduct and regulatory strategy. We have assembled a team with a successful track record of managing global clinical development activities in an efficient manner, and with multinational experience in obtaining regulatory approvals for antiviral therapeutics. Due to the high unmet need of the patients we seek to treat, we intend to work closely with the FDA and EMA to align on the most efficient regulatory pathways for our product candidates.
- ***Maximize the value of our product candidates.*** We generally intend to retain global commercialization rights to our product candidates, which we believe will allow us to retain the greatest potential value of our product portfolio. However, we may opportunistically enter into license agreements or collaborations where we believe there is an opportunity, particularly outside the United States, to maximize the value and accelerate the development of our product candidates and potential commercialization of any products. For example, in October 2020 we entered into the Roche License Agreement under which we granted an exclusive license for certain development and commercialization rights related to AT-527 outside of the United States to Roche. Currently, we plan to establish our own commercial organization in the United States and we may build additional organizations in other selected markets for any of our product candidates that are approved.

- ***Maintain our entrepreneurial outlook, scientifically rigorous approach, and culture of tireless commitment to patients.*** The patients we seek to treat suffer from life-threatening viral infections for which there are no approved therapies or the therapies that are approved have significant drawbacks which may include limited efficacy, or issues with safety and/or tolerability. Members of our team have dedicated their lives to discovering, developing, and commercializing novel antiviral therapies for severe or life-threatening viral infections. We intend to continue building our team of qualified individuals who share our commitment to collaboration and scientific rigor in the development of novel antiviral therapies that have the potential to treat or cure some of the world's most severe viral diseases.

Antiviral therapy

Background on viruses

Viruses are cellular parasites that can only replicate using a host cell's replication processes, as viruses lack the machinery required to survive and replicate on their own. Unlike living organisms that use DNA as the basis for their genetic material, viruses can use either DNA or RNA. Approximately 70% of all viruses are RNA viruses.

Viruses have two primary components: nucleic acid (single or double stranded RNA or DNA) and a protective shell (the capsid). Some viruses may also have a lipid bilayer (the envelope) surrounding the capsid, an additional membrane derived from host cell membranes that contains viral proteins.

The viral replication process begins when a virus attaches itself to a specific receptor site on the host-cell membrane through attachment proteins. The replication mechanism is dependent upon whether the virus is an RNA or DNA virus. DNA viruses use host cell proteins and enzymes to make additional DNA that is used to copy the viral genome or is transcribed to messenger RNA, or mRNA. RNA viruses use their RNA as a template for synthesis of viral genomic RNA and mRNA. The mRNA then instructs the host cell to assemble viral structural proteins. Finally, the newly created virus particles, or virions, are released from the host cell in order to repeat the infection and replication cycle. RNA viruses can be particularly challenging to treat, as the error rates around the RdRp enzyme directed RNA synthesis cause high mutation rates during reproduction, creating resistance challenges for antiviral therapies.

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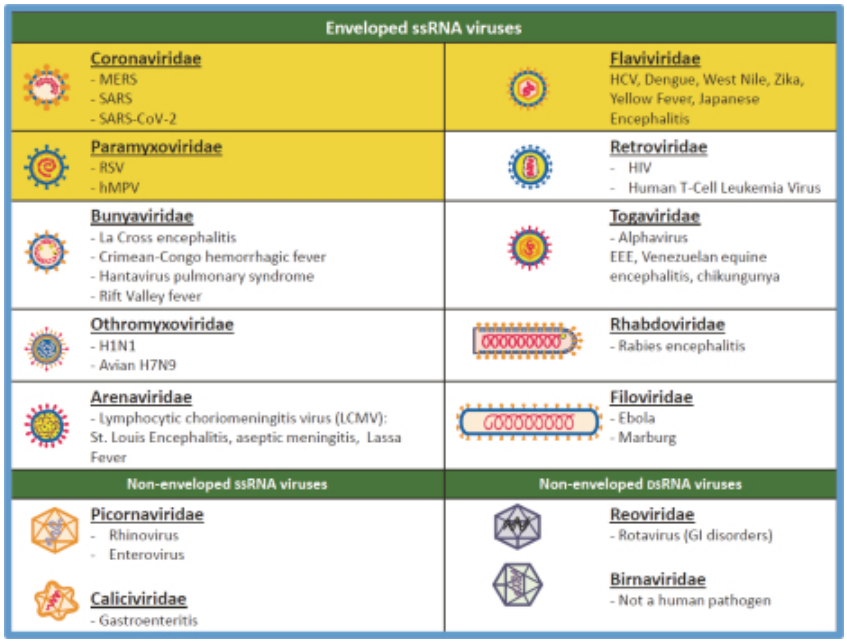
Background of ssRNA viruses

RNA viruses can be ssRNA viruses or double-stranded, or dsRNA, viruses, depending on the type of RNA used as the genetic material. A virus encased within a lipid bilayer is known as an enveloped virus, while a virus without this bilayer is called a non-enveloped virus. Enveloped ssRNA viruses are the more prevalent cause of severe human viral diseases. Studies from the last decade have placed RNA viruses as primary etiological agents of many emerging human pathogens, representing as much as up to 50% of all emerging infectious diseases. Types of enveloped and non-enveloped ssRNA viruses and some of the diseases they cause are shown in the table below, with the types of ssRNA viruses that we are currently targeting with our product candidates highlighted in yellow.



Over the last 40 years, a great deal of progress has been made in the treatment of some of the most severe viral infections. However, many highly pathogenic ssRNA viruses, such as SARS-CoV-2 and dengue virus, remain untreated.

Viral polymerase as an antiviral target

From the discovery and approval of the first antiviral drug in 1963, there have been more than 100 antiviral drugs approved in the United States for the treatment of nine different human viral diseases. A historical challenge with the treatment of intracellular viruses has been selectivity or discovering drug targets that can completely inhibit viral replication without harming the host cells, leading to toxic side effects. Advances in technology and high throughput screening in recent years have driven the discovery of more selective antiviral product candidates. The viral polymerase, which is the single protein present in all RNA viruses, is a key enzyme in the replication of viruses, making for an ideal drug target as its core structural features are highly conserved across different viruses. There are four types of viral polymerase, depending upon the virus and its genomic makeup:

- RdRp: All ssRNA viruses, including SARS-CoV-2 and HCV, depend on the RdRp, encoded in the viral genome, for replication and transcription. Since these enzymes are not present in the host cell, this facilitates the design of selective inhibitors of viral replication, which target viral but not host cell polymerases.

- DNA-dependent DNA polymerase, or DdDP: DdDP is used by DNA viruses to replicate their genome.
- RNA-dependent DNA polymerase, or reverse transcriptase: Reverse transcriptase is used by certain DNA or RNA viruses, such as HBV and HIV-1, to replicate their genomes.
- DNA-dependent RNA polymerase, or DdRP: DdRP is used by DNA viruses to transcribe mRNA from DNA templates during replication.

As RdRp-based synthesis does not occur in human host cells, antiviral drug development for RNA viruses focuses on identifying selective drug-like molecules that target viral RdRp. Advances in technology have enabled intensive structural and functional studies of viral polymerase and have opened avenues for the development of new and more effective antiviral therapies.

Viral resistance and mutations

A major obstacle to antiviral therapy is viral resistance. Resistance is a function of a virus' ability to genetically mutate, which, in the case of RNA viruses, is substantially higher than DNA viruses, as most RdRp lack proofreading abilities. The rate of mutation of RNA viruses can occur at six orders of magnitude greater than the rate of mutation of host cells. The ability of viruses to evolve makes the design of ssRNA-directed therapies challenging, as these viral strains continue to mutate and become more resistant to certain antiviral therapies over time. Since all the enzymes involved in the metabolic pathway of AT-511 to its active triphosphate are designed to be essentially ubiquitous host cell enzymes and not virally encoded proteins, we believe that the high rate of viral mutation does not affect the activation of the prodrug.

At times, combination therapy has been used to combat viral resistance for specific types of human viral infections. The guiding principles to decide when combination therapy may be needed, include: the in vitro inhibitory potency and human pharmacology of the antiviral; viral replication kinetics in patients; viral polymerase error rate; and whether the viral disease is an acute or a chronic infection. With RNA viruses, the treatment of acute infection, such as influenza is monotherapy (e.g., Tamiflu), as compared to the treatment of chronic infection, such as HCV, is combination therapy (e.g., Epclusa). COVID-19, dengue and RSV are each the result of acute RNA viral infections.

Nucleos(t)ide analogs and prodrugs

Nucleic acid, which comprises human and viral genetic material, is composed of natural chemical compounds termed nucleosides and nucleotides. Nucleos(t)ide analogs are synthetic compounds that mimic naturally occurring nucleic acids, so that viral polymerases mistakenly incorporate these analogs as natural nucleic acids causing inhibition of viral replication. These synthetic nucleic acids, once modified into nucleosides and nucleotides within human cells, target the viral polymerase directly. Nucleos(t)ide analogs, compared to other classes of antiviral therapies have a high barrier to resistance due to the conservation of the nucleotide sequences in the RdRp that is required to produce viable virions.

Prodrugs of nucleos(t)ide analogs have become the backbone of therapies to treat life threatening viral infections, including HIV, HBV, and HCV. Prodrugs are employed to bypass rate limiting activation steps and, improve the oral bioavailability and permeation of cell membranes by the nucleos(t)ide analog.

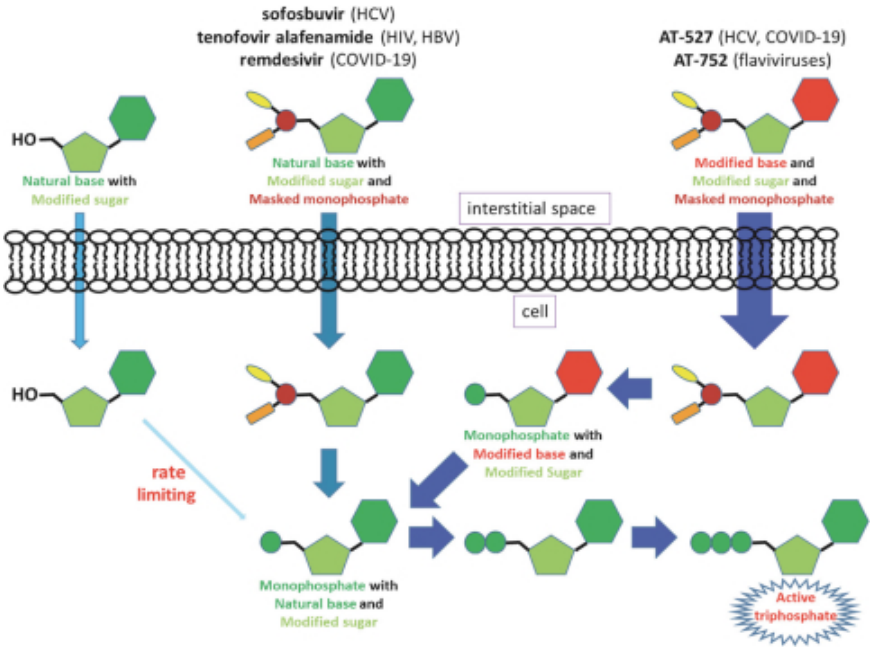
Our platform

Leveraging our deep understanding of antiviral drug development, nucleoside biology, and medicinal chemistry, we have built a proprietary purine nucleotide prodrug platform to develop novel treatments for ssRNA viruses.

Our proprietary nucleotide prodrug platform, as illustrated below, is comprised of the following critical components:

- specific modifications at the 6-position of the purine base, acting as a prodrug, enhance cell membrane permeability, resulting in an intermediate metabolite that maximizes formation of the triphosphate active metabolite in cells;
- stereospecific phosphoramidate, acting as a prodrug, designed to bypass the first rate-limiting phosphorylation enzyme in the intracellular activation pathway;
- specific modifications in the sugar moiety of the purine nucleotide scaffold, producing potent antiviral activity with a high degree of selectivity; and
- highly specific salt form to enhance solubility and drug bioavailability.

Atea's purine nucleotide prodrug platform

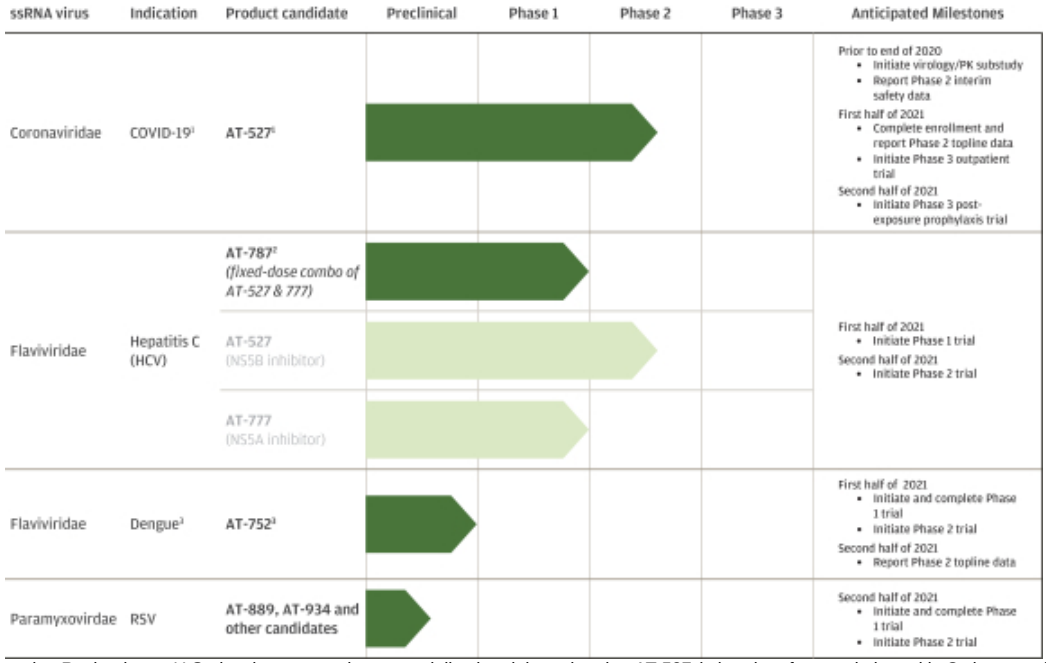


We believe that product candidates derived from our platform, which combines unique purine nucleotide scaffolds with a novel double prodrug strategy, have the following potential advantageous characteristics and features:

- enhanced antiviral activity and selectivity, as well as well-established pharmacology and animal models to predict clinical activity;
- favorable safety profile;
- convenience of once- or twice-daily oral administration; and
- efficient, predictable, scalable, and reproducible manufacturing, as well as long shelf life for potential stockpiling.

Our product candidates

Leveraging our proprietary purine nucleotide prodrug platform, we are advancing a pipeline of orally available, potent, and selective product candidates for difficult-to-treat, life threatening viral infections. All of our product candidates have been discovered and developed internally and we retain full global rights to commercialize our product candidates, other than certain ex-U.S. rights licensed to Roche under the license agreement we entered into with Roche in October 2020, or the Roche License Agreement. We retain the right to commercialize all our product candidates in the United States. The following table summarizes our product candidate pipeline.



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AT-527 for the treatment of COVID-19

SARS-CoV-2

Background

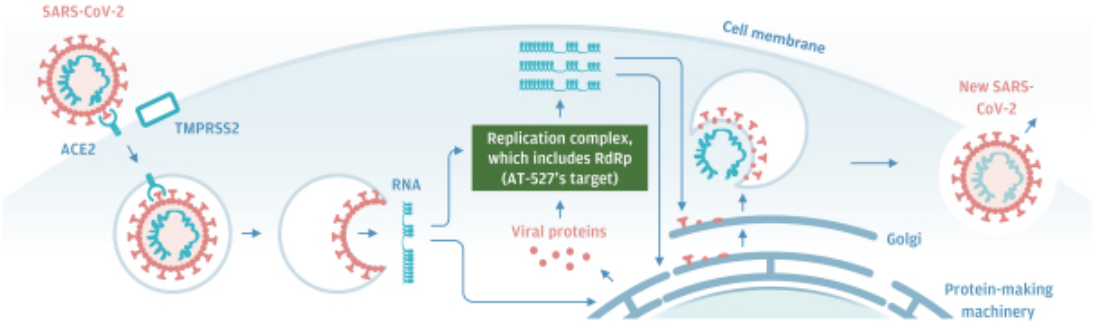
SARS-CoV-2 is a coronavirus, belonging to the *Coronaviridae* family, and is an enveloped virus with a positive sense ssRNA genome which encodes 29 viral proteins. It is one of six other human coronaviruses that exist, with four responsible for one third of common cold infections. To date, no therapies or vaccines have been developed that have proven effective for treating or preventing any of the six discovered coronavirus infections.

SARS-CoV-2 is structurally similar to two other life-threatening coronaviruses: SARS-CoV and Middle East Respiratory Syndrome coronavirus, or MERS-CoV-1. SARS-CoV-2 impairs respiratory function and spreads primarily from person to person via respiratory droplets among close contacts. Symptoms include fever, cough, shortness of breath and fatigue, with symptoms generally appearing two to 12 days after exposure. Severe complications include pneumonia, multi-organ failure, and death.

SARS-CoV-2 was first identified as part of an investigation into an outbreak in Wuhan, China in December 2019, and is thought to have zoonotic origins. Case fatality rates, which measure the number of deaths as a percentage of total infections, have varied widely across different geographies due to variabilities in testing protocols and associated availability, differing demographics across different countries, differences in access to high quality healthcare, and variability in public policy responses for virus control. The World Health Organization, or WHO, estimated a case fatality rate of approximately 3% on March 3, 2020. The Centers for Disease Control, or CDC, has identified populations at high risk of severe illness, including the elderly, those residing in a long-term care facility, and those with underlying health conditions.

SARS-CoV-2 is a spherical virus that carries four different structural proteins: spike protein, envelope protein, membrane glycoprotein and nucleocapsid protein. As shown in the illustration below, the infection cycle begins when the spike proteins bind to the angiotensin-converting enzyme 2 cellular receptor, or ACE2, on the surface of the target cells. A second cell surface protein, transmembrane serine protease 2, or TMPRSS2, enables the virion to enter the cell, where it releases its RNA. Some of this RNA is translated into new proteins using the host cell's machinery—these proteins include the four structural proteins, as well as a number of non-structural proteins that form the replication complex. Within this complex, RdRps catalyze the synthesis of the approximately 30,000-nucleotide RNA viral genome. The proteins and RNA are then assembled into a new virion in the Golgi and released through exocytosis.

SARS-CoV-2 replication process



Given the lack of approved treatments or vaccines for SARS-CoV-2 infections, the primary approach employed to slow the potential transmission of the virus has been to confirm infections through diagnostic testing, followed by the isolation of any infected persons or communities. Testing access and capacity have varied greatly across different countries, as have standards required for testing. In the United States, CDC guidelines recommend analyzing a blend of both clinical and epidemiological evidence to determine potential exposure to SARS-CoV-2. If diagnostic testing is then warranted, the CDC recommends collecting and testing upper respiratory tract specimens via nasopharyngeal swab and, if available, the collection of lower respiratory tract specimens.

Based on data from 44,000 SARS-CoV-2 infected patients in China provided by the Chinese Centers for Disease Control and Prevention, researchers observed that approximately 81% of COVID-19 cases were mild to moderate, with an overall fatality rate of approximately 2%. Severe patients, or those with dyspnea, hypoxia, or greater than 50% lung involvement on imaging, represented approximately 14% of patients. A sub-group of approximately 5% of patients constituted the most critical cases, resulting in an approximately 50% fatality rate within this sub-group. In the United States, the CDC has estimated an overall cumulative hospitalization rate reported as of September 19, 2020 of approximately 174.8 per 100,000 people, with the highest rates in the elderly ages 65 years and older.

Market opportunity

As of October 7, 2020, there were more than 35.6 million confirmed cases of COVID-19 worldwide, with more than 7.4 million cases and over 210,000 deaths from COVID-19 in the United States. This rate of mortality has COVID-19 on track to become one of the deadliest pandemics of the century.

Estimates for global peak cumulative infections vary, as epidemiologists have estimated an infection rate of between approximately 40% and 80% of the population. The lower end of this range would translate to total U.S. and global infections of 131 million and 3.1 billion, respectively.

The COVID-19 pandemic has caused a global public health and economic crisis. As a result, we believe governments are likely to stockpile an effective oral treatment for COVID-19. In response to the 2009 H1N1 swine flu pandemic, governments have been stockpiling Tamiflu, with stockpiles in the United States sufficient to treat 25% of the population, and those in France and the United Kingdom sufficient to treat 50% of the population. Due to the significant health and economic impact of COVID-19, we believe that future stockpiles of a safe and effective therapy could exceed those from the 2009 H1N1 swine flu. Given the novelty of COVID-19, the rapidly evolving response to its treatment, the possibility of the introduction of a vaccine, and the extent of subsequent waves, if any, of the pandemic, the market opportunity for a COVID-19 therapeutic is difficult to predict. However, we believe that stockpiling alone of a COVID-19 therapeutic presents a potentially multibillion-dollar market opportunity.

Treatment landscape

Several therapies and vaccines are currently being investigated to treat or prevent SARS-CoV-2 infection. These include small molecules designed to work as direct acting antivirals, which may be administered for both treatment and potentially prophylaxis, and antibody therapies that will require parenteral administration and may have application in both treatment and prevention. In addition to treatments directed at the virus, there are other immunomodulatory therapies such as interleukin-6 inhibitors, steroids, JAK inhibitors, and anti-tumor necrosis factor antibodies which are being developed to treat the host inflammatory response to the disease. Vaccines are being developed to prevent infection, and to create herd immunity, with the aim of preventing disease, and reducing the amount of virus circulating within the community. Antiviral therapies are complementary to vaccines, and we anticipate that antivirals will continue to be essential because of uncertainties around the level of immunity that the vaccines will be able to generate and the durability of such immunity.

Many therapies under investigation for treatment of COVID-19 were originally designed for other diseases, including HIV, Ebola, and malaria. Remdesivir, the prodrug of an adenosine nucleotide analog, developed for the treatment of ebola virus infection has shown *in vitro* activity against several coronaviruses, including SARS-CoV-2, and in interim data from an ongoing clinical trial, it has been shown that remdesivir accelerated recovery in patients with severe COVID-19. Based on these data and an increasing base of available scientific knowledge, the FDA has granted remdesivir emergency use authorization for the treatment of hospitalized patients with suspected or laboratory-confirmed COVID-19, irrespective of the severity of disease. Remdesivir has also received full marketing approval in Japan. The bioavailability of remdesivir requires that it be administered via intravenous infusion, which we believe is likely to limit its use to hospitalized patients.

Other therapeutic agents under development for the treatment of COVID-19 that are RdRp inhibitors include favipiravir, a nucleoside analog approved in Japan for the treatment of emerging influenza strains and COVID-19, and EIDD-2801, a nucleoside analog that incorporates into the viral RNA leading to lethal accumulation of mistakes or “error catastrophe”.

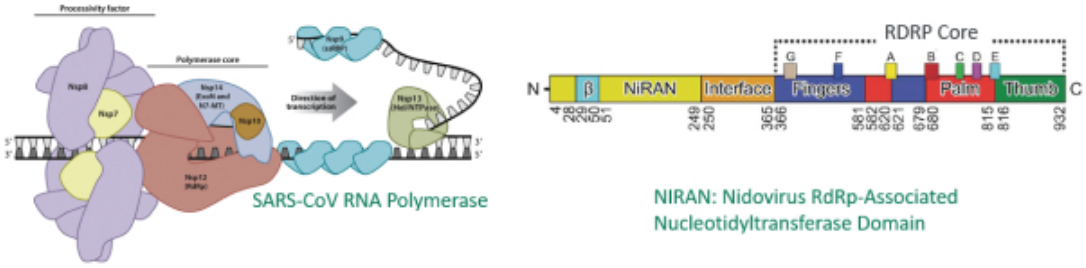
An example of a monoclonal antibody in development is REGN-COV2, an antibody cocktail which targets two different areas of the receptor-binding domain on the spike protein of the coronavirus. Preliminary data from

the first 275 outpatients enrolled in a Phase 1/2/3 study demonstrated reductions in viral load and time to symptom alleviation in seronegative patients. Antibodies are historically more complex than small molecules to manufacture and are administered parenterally. We believe that these two factors will impact and limit use of antibodies for treatment of patients with COVID-19.

Targeting RdRp to treat SARS-CoV-2

The RdRps in SARS-CoV and SARS-CoV-2 support the transcription and replication of their approximately 30,000-nucleotide RNA viral genomes. These RdRps are the largest and most complex RdRps among RNA viruses. As shown in the illustration below, the multi-subunit SARS-CoV RNA synthesis machinery is a complex of non-structural proteins, or nsps, that incorporates processivity factors (nsp-7, nsp-8), an RdRp core with a NIRAN domain (nsp-12), a proofreading exonuclease, a N7-methyl transferase (nsp-14), and a helicase (nsp-13), as well as predicted stimulatory cofactors and capping activities.

SARS-CoV RNA Polymerase



It is possible that any one or more than one of the non-structural proteins in the viral replication complex (RdRp) could be the target for inhibition of coronavirus replication, and the specific mechanism(s) of inhibition by the triphosphate formed from AT-511 is being investigated using SARS-CoV as the model virus. This potential mechanism includes incorporation of the triphosphate formed from AT-511 into the nascent RNA chain followed by premature termination of its elongation as has been observed with other nucleotide analog inhibitors and in other viruses. In addition, the active triphosphate metabolite may bind to the nucleotide binding site of the NIRAN function leading to its potent inhibition. Viral growth inhibition was demonstrated following impairment of the NIRAN function.

It is also conceivable that the proofreading exonuclease activity of nsp14 could remove the terminating analog nucleotide from the RdRp Core, and experiments are ongoing. However, the NIRAN function has no exonuclease activity.

Our approach

We are developing AT-527, an orally administered, novel antiviral product candidate, for the treatment of COVID-19 disease. In October 2020 we entered into a license agreement granting an exclusive license for development and commercialization rights outside of the United States related to AT-527 to Roche, including for the treatment of COVID-19 disease. We also granted Roche a license to manufacture AT-527 worldwide. AT-527 was specifically designed to uniquely inhibit viral RdRp. AT-511, the free base of AT-527, has shown *in vitro* antiviral activity against multiple ssRNA viruses, including human flaviviruses and coronaviruses.

We assessed the *in vitro* potency of AT-511 against SARS-CoV and SARS-CoV-2. The data observed is summarized in the table below.

Antiviral activity was assessed after exposure of Huh-7 cells to virus and serial dilutions of test compound by determining the effective concentration required to reduce secretion of infectious virus into the culture medium

by 90% (EC_{90}) after a 3-day incubation using a standard endpoint dilution $CCID_{50}$ assay to determine virus yield reduction (VYR). Half-maximal cytotoxicity (CC_{50}) was measured by neutral red staining of compound-treated duplicates in the absence of virus.

Since Huh-7 cells were unable to support infection by and replication of SARS-CoV-2, human airway epithelial (HAE) cell preparations were used to assess the activity of AT-511 against this virus, using the same method as described above. Cytotoxicity was assessed by visual inspection of the cells at the end of the 5-day incubation period.

In Vitro Activity of AT-511 (free base of AT-527) Against Human Coronaviruses

Virus (genus)	Cell line	Compound	Cytopathic Effect Assay CC_{50}(μM)	Virus Yield Reduction Assay EC_{90} (μM)	Selectivity Index (CC_{50}/EC_{90})
SARS-CoV (beta)	Huh-7	AT-511	>86	0.34	>250
SARS-CoV-2 (beta)	HAE	AT-511 N^4-hydroxycytidine remdesivir AT-034 (remdesivir)	>86[a]/>8.6[a]/>1.7[a] >19[a] >1.6 >8.3/>1.6	0.64/0.47/0.51 3.9 0.002 0.27/0.014	>130 />18/>3.3 >4.8 >800 >30/>110

[a] Cytotoxicity assessed by visual inspection of cell monolayers

Huh-7, human hepatocyte carcinoma cell line (established ability to form triphosphate from AT-511) HAE, human airway epithelial cell culture (established ability to form triphosphate from AT-511)

N^4 -hydroxycytidine, nucleoside formed from EIDD-2801 (Ridgeback/Merck orally bioavailable ester prodrug)

AT-034 is commercial remdesivir (with COA) purchased by Atea and supplied blinded to be included in second assay

The EC_{90} values for AT-511 against SARS-CoV and SARS-CoV-2 were 0.34 μM and an average of 0.5 μM from three independent experiments. The concentration of AT-511 required to exhibit CC_{50} of the host cells used in these assays to support viral infection and propagation was consistently greater than the highest concentration tested (>86 μM). The sub-micromolar EC_{90} values, in combination with the lack of toxicity observed in the host cells, suggests the potential for high potency and selectivity of AT-511 *in vitro* against these SARS coronaviruses.

The EC_{90} for remdesivir, which was included in both SARS-CoV-2 assays as a positive control and also included as a blinded test article (AT-034) in the second assay, ranged from 0.001-0.27 μM. The potency of remdesivir, however, is likely a combination of its antiviral activity and cytotoxicity since dying and dead cells cannot support efficient viral replication. The CC_{50} for remdesivir, determined by neutral red staining in the SARS-CoV assay conducted in human cells (Huh-7; less precise visual assessments without staining were used to determine cytotoxicity in the HAE assays) ranged from 5-11 μM. Similar *in vitro* cytotoxicity of remdesivir (1.7-36 μM CC_{50}) has been reported in other cell lines.

We also assessed the *in vitro* potency of N4-hydroxycytidine, the nucleoside formed from the oral prodrug EIDD-2801 currently being developed by Ridgeback/Merck for the treatment of COVID-19. N4-hydroxycytidine was eight times less potent than AT-511 in the same experiment. Lastly, sofosbuvir did not inhibit coronavirus replication at concentrations as high as 100 μM.

In addition to assessing the *in vitro* potency of AT-511 against SARS-CoV-2 and SARS-CoV, we evaluated the formation and intracellular half-life of AT-9010, the active triphosphate metabolite of AT-527, in primary human nasal and bronchial epithelial cells. Also, we evaluated the pharmacokinetics and intracellular half-life of AT-9010 in tissues of non-human primates after oral administration of AT-527.

Substantial levels of the active triphosphate of AT-527 were formed in normal human bronchial and nasal epithelial cells incubated *in vitro* with 10 µM AT-511. After an 8-hour incubation, intracellular concentrations of the triphosphate were 698 and 236 µM in the bronchial and nasal cells, respectively. After replacement of the culture medium at 8 hours with fresh medium without AT-511, the half-life of the active triphosphate was determined to be 39 and 38 hours in the respective cell incubations. The accumulation and half-life of remdesivir triphosphate has been reported in the same type of human bronchial epithelial cells incubated with 1 µM remdesivir. After similar eight hour incubations, the concentration of remdesivir triphosphate, normalized to a dose of 10 µM, is at least 7-fold lower than the observed concentration of AT-9010 in the same cell type. In similar incubations of 1 µM remdesivir with human bronchial epithelial cells for two hours followed by washout of drug and continued incubation for 30 hours, the initial half-life of remdesivir triphosphate is less than 8 hours which is at least 4 times shorter than the half-life of AT-9010 in the same primary human lung cells suggesting the accumulation of higher levels of AT-9010 leading to a potentially greater antiviral effect after twice daily oral administration of 550 mg AT-527 versus daily intravenous administration of remdesivir (200 mg loading + 100 mg maintenance doses).

In non-human primates (NHP) administered AT-527 orally for three days in the form of a loading dose (60 mg/kg) followed by five doses (30 mg/kg each) 12 hours apart, intracellular concentrations of the active triphosphate metabolite in lung, kidney and liver tissue 12 hours after the last dose (trough levels with respect to twice daily dosing) were 0.14, 0.13 and 0.09 µM, respectively. Since the NHP doses were allometrically scaled to be equivalent to the initially intended clinical doses for COVID-19 subjects (1100 mg loading dose + 550 mg maintenance doses) and since *in vitro* levels of the triphosphate in primary NHP hepatocytes incubated with 10 µM AT-511 had previously been determined to be 7-fold lower than the corresponding levels in primary human hepatocytes, this ratio was used to predict steady-state intracellular trough triphosphate concentrations of 0.98, 0.91 and 0.62 µM in lung, kidney and liver tissues, respectively, of COVID-19 subjects treated with AT-527. The predicted trough concentration of the triphosphate in lung cells in prospective COVID-19 subjects was also obtained from a simulation of the steady-state plasma pharmacokinetics of AT-273 (surrogate for intracellular triphosphate concentrations) with twice daily dosing obtained from published data in HCV subjects given once-daily oral doses of 550 mg AT-527 and adjusted by the 1.6-fold greater triphosphate concentration in lung versus liver 12 hours after the last dose in NHP. This estimate is based on the established close pharmacokinetic-pharmacodynamic relationship between plasma AT-273 concentrations and the antiviral effect in HCV-infected patients. The predicted human lung trough concentration of the active triphosphate from this simulation (0.86 µM) was in good agreement with that obtained from the trough concentration scaled from NHP lung tissue (0.98 µM). We believe both predictions suggest that trough levels of the active triphosphate in COVID-19 patients during treatment with AT-527 should exceed the EC_{90} of 0.5 µM for AT-511 against SARS-CoV-2 replication. Moreover, we believe both predictions likely underestimate triphosphate trough levels in human lung since neither account for the extended intracellular half-life (39 hours) of the triphosphate in human lung epithelial cells.

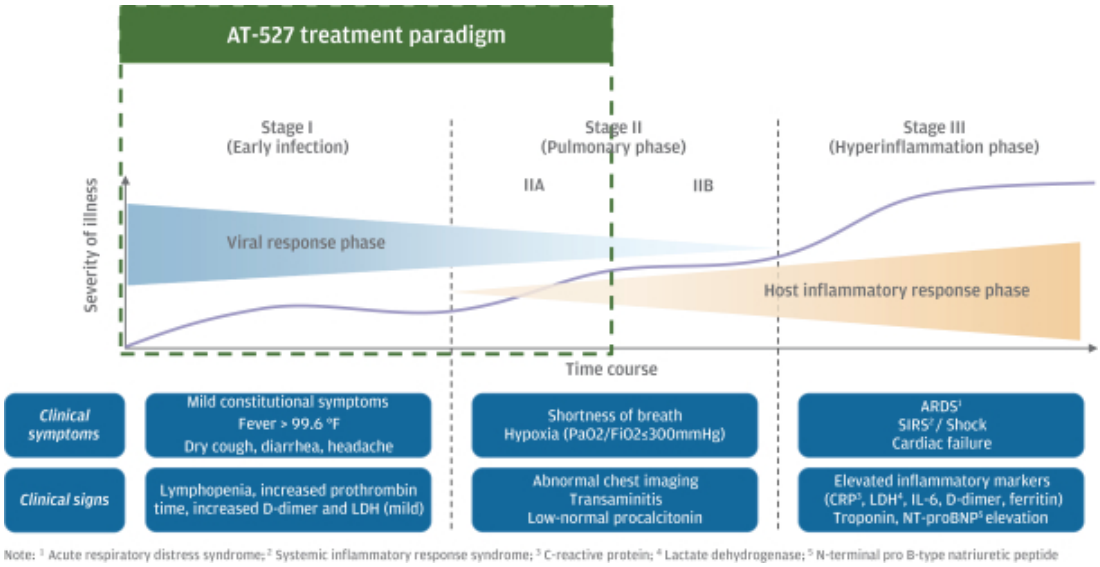
Development history

AT-527 was initially developed for the treatment of chronic HCV, and we have conducted two clinical trials of AT-527 in HCV. See *–Hepatitis C virus (HCV)—Clinical development*. By utilizing data we obtained in our HCV clinical trials of AT-527, we were able to initiate our clinical development program of AT-527 for the treatment of patients with COVID-19 with a Phase 2 trial. Using the PK data from our HCV clinical trials, which showed 50-60% bioavailability and a long intracellular half-life of the active triphosphate derived from AT-527, we have selected doses for our COVID-19 clinical trial that are intended to obtain drug exposure at pharmacologically relevant concentrations. The safety and tolerability of AT-527 has been evaluated in 82 clinical trial subjects comprised of 30 healthy volunteers (ages 29 to 65 years old) and 52 HCV-infected patients (ages 29 to 64 years old). No serious adverse effects were observed in these trials. The most common side effects observed were

headache and small increases in blood lipid levels, with no consistent patterns in other reported side effects. Most side effects were not severe and were not thought to be related to AT-527.

Clinical development strategy

COVID-19 is an acute viral infection. We believe antiviral therapeutics should be most effective against COVID-19 within the first stage of the infection when the viral load is at its maximum, which is consistent with rapid viral replication initially in nasal cells, throat cells and ultimately pulmonary cells. As shown in the illustration below, we believe that the use of a potent, safe, oral antiviral therapeutic to treat SARS-CoV-2-infected individuals in the early stage of infection will mitigate the onset of severe COVID-19 and avert hospitalization.



Note: [1] Acute respiratory distress syndrome; [2] Systemic inflammatory response syndrome; [3] C-reactive protein; [4] Lactate dehydrogenase; [5] N-terminal pro B-type natriuretic peptide

Phase 2 clinical trial

We are currently conducting a randomized, double blind, placebo-controlled multi-center global Phase 2 trial of AT-527 which is expected to enroll approximately 190 COVID-19 hospitalized patients.

Patients eligible for enrollment in this Phase 2 clinical trial are aged 45 to 80 years with moderate COVID-19 illness and at least one risk factor suggestive of poor outcome (such as obesity, hypertension, a history of diabetes, or a history of asthma). Moderate severity is defined as having at least one symptom of lower respiratory infection consistent with COVID-19, as well as oxygen saturation below 93% on room air or requiring £2L/min oxygen to maintain oxygen saturation in excess of 93%. The primary efficacy endpoint is the change in level of respiratory insufficiency, assessed on an ordinal 6-category scale of respiratory support levels, as compared to placebo, where a statistically significant finding would be reflected by a significantly lower probability for AT-527-treated subjects to exhibit a worsening of respiratory insufficiency (requiring £2 level higher respiratory support) during the study compared to placebo recipients. The six categories of the ordinal scale are: (1) no respiratory support; (2) low-level passive O2 supplementation (up to 2 L/min) by mask or nasal cannula; (3) higher O2 supplementation (>2 L/min); (4) any non-invasive form of positive-pressure oxygenation/ventilation; (5) invasive respiratory support; and (6) death. We believe the most important outcomes to be assessed in this trial are the reduction in progression to higher levels of required respiratory

support, which we believe could be life-saving for patients with significant risk factors, as well as reduced duration of the COVID-19 acute illness and hospitalizations.

Trial participants are being randomized 1:1 (AT-527: placebo). The first 20 patients (10 AT-527, 10 placebo) received a dose of either 550 mg free base of AT-527 or placebo twice daily for five days in addition to supportive standard of care. In accordance with the protocol, an independent Data Safety Monitoring Board, or DSMB, conducted a safety review and approved continued enrollment of patients in the trial.

In accordance with the protocol, we will enroll a second cohort of 20 patients and enrollment will again be paused for a planned DSMB review of the safety data associated with this second cohort of 20 patients. Upon DSMB approval to proceed after the second cohort of 20 patients, the enrollment of the remainder of the patients will be re-initiated with planned pauses and DSMB reviews at each of the 50% and 75% enrollment levels.

To enhance the virological data we may derive from the Phase 2 clinical trial, we are planning to add a virology pharmacokinetic/pharmacodynamic sub-study which will be conducted at a limited number of the clinical trial sites participating in the Phase 2 clinical trial. This sub-study will include additional biological sampling for quantitative (viral load) evaluation.

We expect to complete enrollment and report topline data from the Phase 2 trial and virological sub-study in first half of 2021.

Planned clinical development

In addition to the Phase 2 clinical trial, we also plan to conduct a clinical trial of AT-527 in healthy volunteers. From this clinical trial, we anticipate obtaining additional pharmacokinetics and safety data of AT-527 at the 550 mg twice daily dose. We expect to initiate and complete enrollment in the healthy volunteer clinical trial prior to the end of 2020.

After receiving the safety results from at least 40 patients enrolled in our Phase 2 trial as well as the supportive data from the healthy volunteer clinical trial, we expect to initiate a Phase 3 clinical trial to study AT-527 in patients with mild to moderate COVID-19 requiring outpatient management.

We are designing this Phase 3 trial to enroll up to 600 patients aged 18 years or older. The primary objective of the trial is expected to be evaluation of the efficacy of AT-527 compared to placebo by measuring the time to alleviation of symptoms, or TAS, in patients with SARS-CoV-2 virus infection with mild or moderate disease. The primary endpoint of TAS is defined as the time when all COVID-19 symptoms are assessed and self reported by the patient as none or mild for a duration of at least 24 hours. Patients will assess the severity of disease on a 4-point scale (with 0 indicating no symptoms, 1 mild symptoms, 2 moderate symptoms, and 3 severe symptoms).

We are also planning to conduct a randomized double-blind, post-exposure prophylaxis Phase 3 clinical trial evaluating the reduction of direct transmission from SARS-CoV-2 infected patients (index case) to contacts. Pending additional discussions with regulatory authorities, the primary endpoint is expected to be the proportion of participants who test positive by PCR at predetermined timepoints.

To align on the most efficient regulatory pathway for AT-527 in COVID-19, we intend to work closely with the FDA and other regulatory authorities as we plan and implement the clinical trials described above. We may pursue expedited FDA review and approval programs, such as Breakthrough Therapy designation.

We are currently conducting manufacturing campaigns at third-party contract manufacturers that will result, when combined with our current drug tablet inventory, in an inventory of AT-527 550 mg tablets and matching

placebo that is expected to satisfy the clinical trial material requirements for our currently planned COVID-19 clinical trials. Additionally, we are engaged, through our contract manufacturers, in the optimization of the synthetic process and formulation for commercial scale manufacture of AT-527 550 mg tablets. We are targeting availability of initial commercial supply of AT-527 beginning in 2021.

AT-787 for the treatment of hepatitis C

Hepatitis C virus (HCV)

Background

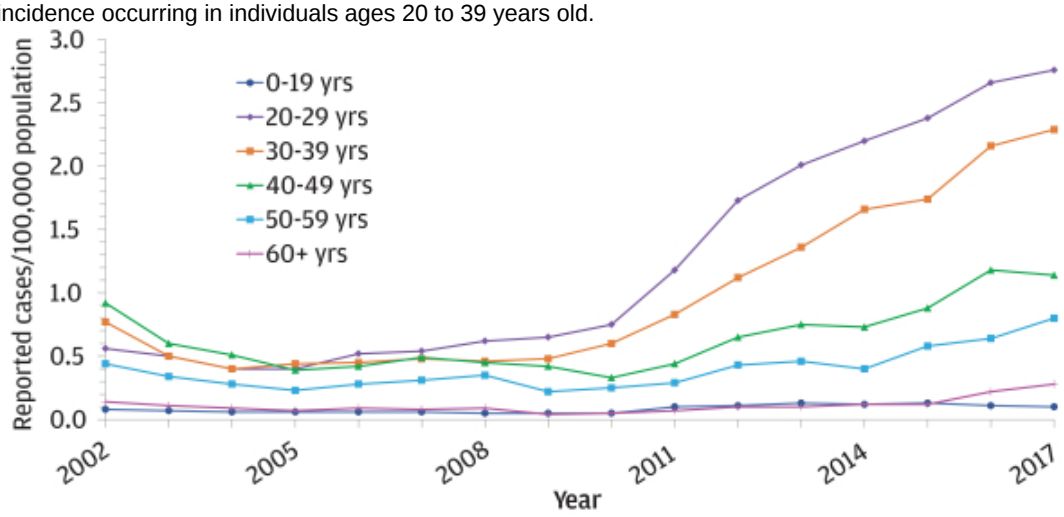
HCV is a blood-borne, positive sense, ssRNA virus, primarily infecting cells of the liver. HCV is a leading cause of chronic liver disease and liver transplants and spreads via blood transfusion, hemodialysis and needle sticks. Injection drug use accounts for approximately 60% of all new cases of HCV. Diagnosis of HCV is made through blood tests, including molecular tests that allow for the detection, quantification and analysis of viral genomes and the classification of an infection into specific viral genotypes. Hepatitis C becomes chronic Hepatitis C in 75% to 85% of cases, with an incubation period lasting from two to 26 weeks.

HCV is classified into seven genotypes and 67 subtypes, with genotype 1 responsible for more than 70% of HCV cases in the United States. Patients with HCV are also classified by liver function status: compensated cirrhosis (liver scarring) denotes those patients that do not yet have impaired liver function, while decompensated cirrhosis describes patients with moderate to severe liver function impairment.

Market opportunity

According to the WHO, an estimated 71 million people are chronically infected with HCV, a significant portion of which are likely to develop cirrhosis or liver cancer. Of those infected with HCV, only 20% are diagnosed and 2% are treated globally. The WHO estimates that 399,000 people died from HCV in 2016.

As shown in the table below, the CDC reported that new infections in the United States have increased substantially from 2011 to 2017 with the greatest increase in incidence occurring in individuals ages 20 to 39 years old.



Despite recent advances in treatment, there remains a large undeserved HCV patient population which continues to grow. The CDC estimated the incidence of HCV in 2018 increased by 50,300 cases in the United States. In 2019, aggregated global sales of direct acting antiviral HCV therapeutics manufactured by Gilead Sciences, Inc. and AbbVie Inc. approximated $5.8 billion. It is estimated that a substantial global market for HCV therapeutics will exist to 2050 and beyond.

Current treatment landscape

No vaccine exists for the prevention of HCV, but several recently introduced oral antiviral therapeutics have boosted sustained virologic response rates to over 95% in a majority of patients, with treatment durations reduced to eight to 12 weeks depending upon the regimen and patient population. There are three classes of direct acting antiviral therapeutics, defined by their mechanism of action and therapeutic target: NS3/4A protease inhibitors, NS5A inhibitors, and NS5B non-nucleos(t)ide polymerase inhibitors. A patient's genotype, cirrhotic status, and prior treatment failures determine the appropriate antiviral therapeutic used in treatment. The two leading therapeutics for treatment of chronic HCV are:

- **Epclusa** (sofosbuvir/velpatasvir): Epclusa was first approved by the FDA in 2016 for the treatment of adults with chronic HCV infection with any of genotypes one through six infection, either without cirrhosis or with compensated cirrhosis. For patients with decompensated cirrhosis, Epclusa is approved for use in combination with ribavirin. Patients on Epclusa require 12 weeks of treatment.
- **Mavyret** (glecaprevir/pibrentasvir): Mavyret was first approved by the FDA in 2017 for the treatment of adults with chronic HCV with any of genotypes one through six infection, without cirrhosis or with compensated cirrhosis. Mavyret is also approved for HCV patients with genotype 1 infection who have been previously treated with a regimen either containing an NS5A inhibitor or an NS3/4A protease inhibitor (but not both). Mavyret was the first eight-week treatment approved for HCV genotypes one through six in adult patients without cirrhosis who have not been previously treated. In 2019, the FDA approved shortening the treatment duration from 12 weeks to eight weeks in treatment-naïve, compensated cirrhotic HCV patients across all genotypes one through six. Mavyret is not approved for use in patients with decompensated cirrhosis.

Our approach

We are developing AT-787 for the treatment of chronic HCV infection, including patients with decompensated cirrhosis. AT-787 combines AT-527 with a second-generation NS5A inhibitor, AT-777, into a single, oral, pan-genotypic fixed-dose combination therapy. Based on our preclinical and clinical data to date, we believe that AT-787, if approved, could offer the following potential benefits over currently available treatments:

- Shorten treatment duration to eight weeks in non-cirrhotic and compensated cirrhosis HCV in all genotypes. Current HCV therapies typically require longer dosing in cirrhotic patients to achieve a sustained virologic response, or SVR, that is close to, but often proportionally lower, than the SVR achieved with shorter treatment of non-cirrhotic patients.
- Equivalent antiviral potency across all genotypes, regardless of cirrhotic status, including the difficult to treat genotype-3 population.
- Obviate the need for extensive pretreatment assessments required by current treatment options, including genotyping, fibroscan (if cirrhosis is present), and liver function assessment.
- Eliminate the need for ribavirin in patients with decompensated cirrhosis. Ribavirin, an antiviral first approved in 1986, carries several FDA "black box" warnings, including the risk of hemolytic anemia and teratogenicity.

- Well tolerated, with low potential for drug-drug interactions. Mavyret, which carries an FDA warning for cirrhotic patient treatment, is not to be prescribed for patients on atazanavir or rifampin, while Epclusa could cause a slow heart rate when taken with amiodarone.

Clinical development

We have conducted two clinical trials of AT-527.

Phase 1 clinical trial of AT-527

We conducted a Phase 1 trial to evaluate single and multiple doses of AT-527 as a single agent in healthy and HCV-infected subjects for up to seven days. All HCV-infected subjects were treatment-naïve with HCV RNA ^{3} 5 $\log_{10}$ IU/mL. The objectives of the trial were to assess safety, tolerability, PK and antiviral activity.

The trial evaluated single oral doses of AT-527 up to 369 mg free base (400 mg salt form) in healthy subjects (Part A), single doses up to 600 mg salt form (553 mg free base) in non-cirrhotic HCV-infected subjects (Part B), and multiple doses up to 600 mg salt form (553 mg free base) once daily for seven days in non-cirrhotic genotype 1b, or GT1, HCV-infected subjects (Part C). Additional cohorts evaluated 600 mg salt form (553 mg free base) once daily for seven days in non-cirrhotic genotype 3, or GT3, (Part D) and Child-Pugh A cirrhotic genotype 1b/3, or GT1b/2, HCV-infected subjects (Part E). The tables below show the dosage and mean maximum HCV RNA reductions for each treatment cohort.

A total of 88 subjects were dosed across all parts of the trial, with 72 subjects who received active drug and 16 subjects who received placebo. In this trial, AT-527 showed equivalent pan-genotypic antiviral activity in both cirrhotic and non-cirrhotic HCV infected patients. The mean HCV reduction within 24 hours after a single dose was up to 2.4 $\log_{10}$ IU/mL, and the mean maximum HCV RNA reduction after seven days of dosing with AT-527 at 553 mg free base was 4.6 $\log_{10}$ IU/mL. Data also showed a mean maximum HCV RNA reduction of 4.4 $\log_{10}$ IU/mL after seven days of dosing of AT-527 at 553 mg free base in non-cirrhotic genotype 1b, or GT1b, HCV-infected subjects, and a mean reduction of 4.5 $\log_{10}$ IU/mL after seven days of dosing in non-cirrhotic GT3 HCV-infected subjects. The PK data in cirrhotic subjects was similar to non-cirrhotic subjects. E_{max} modeling predicted that a dose of 553 mg free base of AT-527 once daily would result in maximum viral load reduction.

TABLE 3

Maximum HCV RNA change in Part B (single dose in non-cirrhotic, GT1 HCV-infected subjects)

Maximum Reduction ($\log_{10}$ IU/mL) AT-527 dosage (free base equivalent)	100 mg (92 mg) N=3	300 mg (277 mg) N=3	400 mg (369 mg) N=3	600 mg (553 mg) N=3
Mean±SD*	0.8 ±0.153	1.7 ±0.564	2.2 ±0.391	2.3 ±0.255
Individual	0.6, 0.8, 0.9	1.1, 1.8, 2.2	1.8, 2.2, 2.5	2.1, 2.3, 2.6

Maximum HCV RNA change in Part C (multiple dose in non-cirrhotic, GT1 HCV-infected subjects)

Maximum Reduction (log_{10} IU/mL)	Placebo QD** x 7 days (N=6)	150 mg (138 mg) QD x 7 days (N=6)	300 mg (277 mg) QD x 7 days (N=6)	600 mg (553 mg) QD x 7 days (N=6)
Mean ±SD	0.4±0.109	2.6±1.073	4.0±0.415	4.4±0.712
Individual	0.3, 0.3, 0.4, 0.4, 0.5, 0.6	1.7, 1.8, 1.8, 2.7, 3.0, 4.5	3.4, 3.7, 3.9, 4.2, 4.2, 4.5	3.5, 4.0, 4.1, 4.3, 5.2, 5.3

Maximum HCV RNA change in Part D (multiple dose in non-cirrhotic, GT3 HCV-infected subjects) and Part E (multiple dose in cirrhotic HCV-infected subjects)

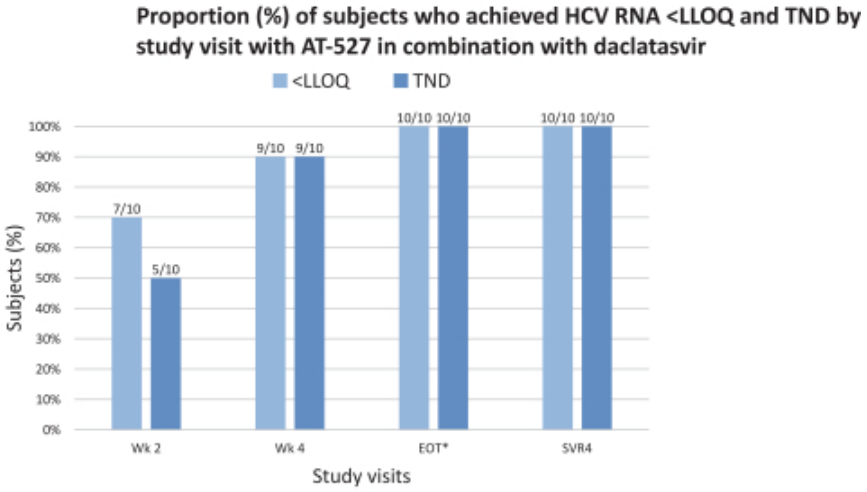
Maximum Reduction (log_{10} IU/mL)	Part D – GT3	Part E – Cirrhotic
	600 mg (553 mg) QD x 7 days (N=6)	600 mg (553 mg) QD x 7 days (N=6)
Mean ±SD	4.5±0.262	4.6±0.485
Individual	4.2, 4,4, 4.4, 4.5, 4.5, 5.0	GT1b: 4.0, 4.0, 4.5 GT2: 5.0 GT3: 4.8, 5.2

* SD = standard deviation
** QD = twice daily

Phase 2 clinical trial of AT-527 in combination with an NS5A inhibitor

We conducted a Phase 2, open-label clinical trial to evaluate AT-527 in combination with daclatasvir, an approved commercially available HCV NS5A inhibitor, in HCV-infected subjects. Ten treatment-naïve, non-cirrhotic GT1 HCV-infected subjects received 553 mg free base AT-527 and 60 mg daclatasvir once daily for a period of eight or 12 weeks. The primary efficacy endpoint of the study was an SVR of 12, with secondary efficacy endpoints that included HCV RNA< Lower Limit Of Quantitation, or LLOQ, and Target Not Detected, or TND, by study visit, HCV RNA changes from baseline, alanine transaminase normalization in those who had elevated levels at baseline, virologic failure, and resistance-associated substitutions to either of the study drugs. All subjects completed the treatment period in the study, nine of whom received eight weeks of treatment and one of whom received 12 weeks of treatment. All subjects achieved an SVR of four, nine of whom received only eight weeks of treatment. As shown in the graph below, viral load decreased rapidly, with 70% of subjects achieving plasma HCV RNA < LLOQ by week 2 (and 50% achieving TND by week 2). We believe that the rapid early clearance of HCV RNA observed in this trial supports continued evaluation of AT-527 in shortened treatment regimens, ideally with a more potent, next-generation HCV NS5A inhibitor.

FIGURE 10



LLOQ: lower limit of quantification; TND: target not detected

*End of treatment (EOT) = 8 wks for 9 subjects and 12 wks for 1 subject

AT-527 Safety Results

There were no serious adverse events, dose-limiting toxicities or adverse events leading to trial discontinuation observed in our Phase 1 or our Phase 2 clinical trial of AT-527. The most common side effects observed were headache and small increases in blood lipid levels, with no consistent patterns in other reported effect. Most side effects were not severe and were not thought to be related to AT-527.

Planned clinical development

We have temporarily paused our development program for AT-787 in HCV infected patients, given industry-wide challenges in clinical studies during the COVID-19 pandemic. We expect to initiate this program once the planned clinical trial sites are able to re-open and resume patient enrollment, starting with our Phase 1/2A clinical trial which is designed to evaluate the safety and PK of different dosages of AT-777 in healthy adults and

evaluate the combination of AT-527 and AT-777. We currently anticipate that this will occur in the first half of 2021. The Phase 1/2A clinical trial is comprised of two parts. Part A is a randomized, blinded, sequential-dose trial to evaluate the safety, tolerability and PK of AT-777 alone in up to 24 healthy volunteers. Part B is an open-label trial in up to 20 patients with HCV to evaluate AT-527 in combination with AT-777. The primary objective of Part B are safety, antiviral activity and PK. Following the completion of the Phase 1/2A clinical, we anticipate commencing a Phase 2b clinical trial to further evaluate the antiviral activity and safety of AT-787, the fixed dose combination of AT-777 and AT-527.

AT-752 for the treatment of dengue

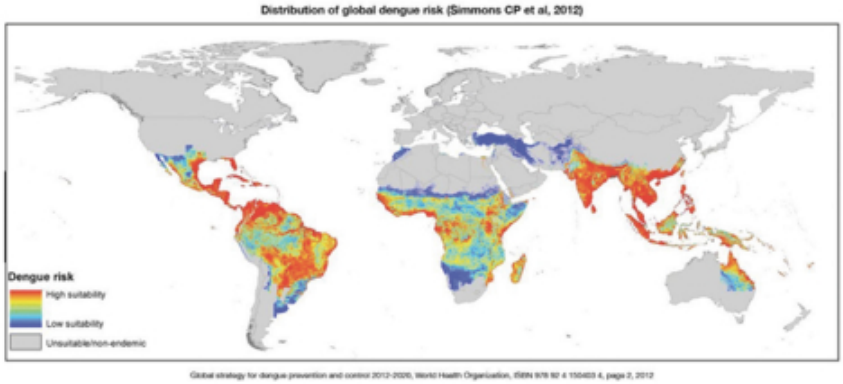
Dengue virus

Background

Dengue, which is caused by a positive sense ssRNA virus belonging to the *Flaviviridae* family, is a mosquito-borne viral infection. Dengue causes flu-like symptoms in both children and adults and is spread through the bite of an infected mosquito. There are five dengue viral serotypes, and infection with serotype does not produce immunity to another serotype. Thus, a person could be infected with dengue multiple times and reinfection typically results in a more severe disease. Symptoms include fever, eye pain, headache, swollen glands, rash, muscle pain, bone pain, nausea, vomiting, and joint pain, and last two to seven days post-infection.

Market opportunity

Globally, three billion people, or roughly 40% percent of the world's population, live in high-risk dengue areas, while up to 400 million are infected each year, resulting in 500,000 hospitalizations. The WHO has called dengue the most important mosquito-borne viral disease in the world. Although dengue rarely occurs in the continental United States, it is endemic in Puerto Rico, Southeast Asia, Latin America and the Pacific Islands, as shown in the map below.



According to the CDC, 5% of infected patients develop a life-threatening form of dengue called severe dengue. Those who develop severe dengue may have some or all of the following complications: severe abdominal pain, fatigue, severe bleeding, organ impairment, and plasma leakage. The mortality rate of severe dengue ranges between 12% and 44%, if left untreated. The global economic cost burden of dengue was estimated at $8.9 billion in 2013, with nearly 50% of the costs associated with hospitalizations. We estimate the commercial market for a treatment of dengue to be approximately $500 million.

Current treatment landscape

There are no FDA or EMA approved therapies indicated for the treatment of dengue. Current treatment protocols involve supportive care, including analgesics, judicious fluid replacement, and bed rest. In 2019, a vaccine, Dengvaxia developed by Sanofi Pasteur Inc., or Sanofi, was approved by the FDA for the prevention of disease caused by dengue virus serotypes 1, 2, 3 and 4 in children ages nine to 16 with laboratory-confirmed previous dengue infection and living in endemic areas.

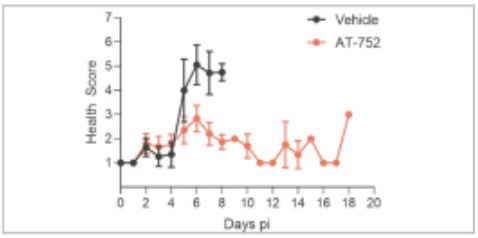
Takeda Pharmaceuticals Co Ltd, or Takeda, is also advancing a dengue vaccine, TAK-003, which is in Phase 3 development. Primary endpoint analysis of its ongoing Phase 3 trial in children ages four to 16 years showed protection against virologically-confirmed dengue.

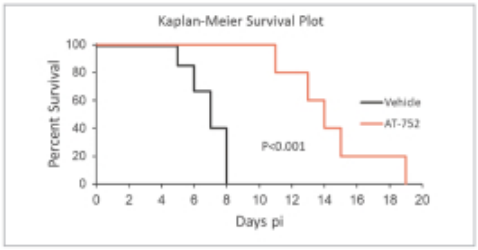
Our approach

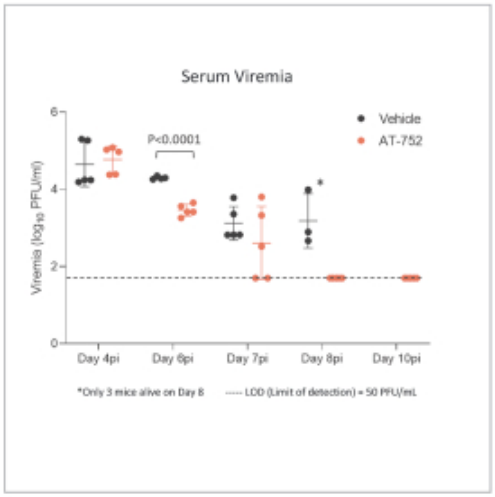
We are developing AT-752, an oral, purine nucleoside prodrug product candidate. AT-752 has shown potent activity against all serotypes tested in preclinical studies. AT-752 works by targeting the inhibition of the dengue viral polymerase. We intend to explore the potential development of AT-752 as a prophylactic treatment for dengue, which if approved, could be directed at the travelers' market. In October 2020, as a part of the Roche License Agreement, we agreed that we would not commercialize AT-752 outside the United States unless we entered into a separate commercialization agreement with Roche to do so.

Preclinical development

We have conducted preclinical studies of AT-752 in which we pre-treated AG129 mice with AT-752 (1000 mg/kg, p.o.) for four hours before subcutaneous inoculation with D2Y98P dengue strain and subsequent dosing of AT-752 twice daily (500 mg/kg, p.o.) for seven days, starting one hour post inoculation. This disease model, which ultimately resulted in fatal central nervous system sequelae, showed notable differences in overall health, survival, and viremia between AT-752-treated mice and mice that were treated with vehicle. As shown in the graphs below, viral RNA in serum was statistically significantly lower than control by day 6 and below the limit of detection, or LOD (LOD: 50 copies per m/L) on day 8, after seven days of drug treatment.







The antiviral activity of AT-281, the free base of AT-752, was evaluated under contract with the National Institutes of Health and Infectious Disease against a variety of flaviviruses. Huh-7 cells were infected with

individual viral strains and exposed to serial dilutions of AT-281. A virally induced cytopathic effect, or CPE, assay using a neutral red dye uptake endpoint or a virus yield reduction measurement using a standard endpoint dilution $CCID_{50}$ assay was used to measure the antiviral EC_{50} or EC_{90} value, respectively. Uninfected cell controls concurrently exposed to drug were used to determine cytotoxicity (CC_{50}) using the CPE assay. AT-281 demonstrated sub-micromolar potencies against all flaviviruses tested (summarized in the table below), with an EC_{90} of 0.64 µM against Dengue type 2 and an EC_{50} of 0.77 µM against Dengue type 3. No toxicity was detected for AT-281 up to the highest concentration tested (172 µM).

Virus	Strain	EC_{90} (µM)	CC_{50} (µM)	SI[a]
Dengue type 2	New Guinea C	0.64	>172	>270
Dengue type 3	H87	0.77[b]	>172	>220
Japanese encephalitis	SA-14	0.21[b]	>172	>820
West Nile	Kern 515, WNo2	0.43	>172	>400
Yellow Fever	YFV 17D	0.26	>172	>660
Zika	MR766	0.64[b]	>172	>270

a Selectivity index (CC_{50}/EC_{90} or CC_{50}/EC_{50})
b EC_{50}

Planned clinical development

We plan to submit an IND to the FDA or Clinical Trial Application to one or more competent authorities in countries outside the United States prior to the end of 2020. Contingent upon receipt of FDA or other competent authority authorization, we expect to initiate a randomized, double-blind, placebo-controlled Phase 1 trial to analyze the safety and PK of several different dosages of AT-752 in healthy adult subjects in the first half of 2021. Following the completion of the Phase 1 trial, we expect to initiate in the first half of 2021 a Phase 2 trial of AT-752 in adult subjects with dengue, to evaluate antiviral activity, safety and PK. We intend to pursue FDA expedited development and review programs for AT-752. Dengue is also defined as a tropical disease under the Federal Food, Drug and Cosmetic Act, or FDCA, and therefore FDA approval of AT-752 for the treatment of Dengue may result in a priority review voucher.

AT-889, AT-934 and other candidates for the treatment of respiratory syncytial virus (RSV)

Respiratory syncytial virus

Background

RSV is a seasonal respiratory virus that can be serious for infants, older adults, and the immuno-compromised population. Although the virus is seasonal, the duration, peaks and severity of the virus vary each season. RSV, a negative ssRNA virus belonging to the *Pneumoviridae* subfamily of the *Paramyxoviridae* family, is the most common cause of bronchiolitis (inflammation of the small airways in the lung) and pneumonia (infection of the lungs) in children in the United States. Almost all children contract the RSV infection by their second birthday.

The primary symptoms of RSV infections include coughing, wheezing, fever, decreased appetite, and runny nose. In the United States, RSV infections generally occur during fall, winter and spring, but the timing and severity can vary from year to year and from region to region. Two different strains of the virus co-circulate each season, and RSV epidemics last from four to six months.

Market opportunity

Globally, RSV affects 64 million people, according to the National Institutes of Health, or the NIH, with annual mortality estimated at 160,000 deaths. The market for RSV treatment is estimated to exceed $5 billion by 2024.

We expect to target three distinct populations over time with our product candidates: the elderly, the immunocompromised and children, with an initial focus on the elderly.

- **Elderly**: Among the elderly, the CDC estimates that RSV is responsible for 177,000 hospitalizations in the United States. An estimated 14,000 annual deaths are caused by RSV in the United States in adults older than age 65.
- **Immunocompromised**: Globally, there are more than 50,000 hematopoietic stem cell transplants annually. Studies suggest that there is a significant risk of hospital mortality due to respiratory failure in immunocompromised patients with lower respiratory disease.
- **Children**: The NIH estimates that RSV results in 75,000 to 125,000 child hospitalizations in the United States. Globally, it is estimated that RSV results in 3.2 million hospital admissions in children younger than five years of age.

Current treatment landscape

Treatment for RSV typically focuses on supportive care, which can include nasal suction, fever management, hydration, and oxygen. The FDA approved aerosolized ribavirin in 1986 for the treatment of serious RSV infections in hospitalized children. However, ribavirin, a nucleoside analog, carries a number of safety concerns, including potential toxicity for exposed persons. Aerosolized ribavirin has not been approved for use in the elderly or immunocompromised populations.

In addition, the FDA approved Synagis (palivizumab) in 1998 for the prevention of lower respiratory tract disease caused by RSV in children at high risk of RSV disease. Synagis is administered as an injection every month during RSV season. Synagis has not been approved for treatment of RSV, nor is it indicated for use in populations other than children under 24 months of age.

Our approach

We are evaluating two lead compounds, AT-889 and AT-934, second-generation nucleoside pyrimidine prodrugs, and other compounds. Our development efforts in RSV have focused on two strategies: fusion inhibitors and replication inhibitors (both nucleoside and non-nucleoside). We believe AT-889, AT-934 or one of our other product candidates for RSV has the potential to inhibit both the initiation of viral replication, as well as viral transcription. We plan to develop our product candidate in both oral and parenteral dosage formulations.

Development history

We have observed the antiviral potency and selectivity of AT-889 and AT-934 against RSV in *in vitro* cell-based assays. The EC_{50} to inhibit replication of the RSV (strain A Long) was 0.20 µM for AT-889 and 0.46 µM for AT-934. The concentrations of both compounds required to exhibit a CC_{50} of the host cells used in these assays were greater than 50 µM.

Development strategy

Currently, we are evaluating the antiviral activity of AT-889 and AT-934 and other compounds in *in vitro* studies to inform our selection of a lead candidate. Once chosen, we will assess the *in vivo* antiviral activity of such lead candidate in a small animal model, and conduct IND-enabling toxicology studies. Thereafter we intend to nominate a product candidate for clinical development. We anticipate nominating our product candidate and initiating a Phase 1 trial to evaluate safety and PK of this product candidate in healthy subjects in the second half of 2021. Following completion of the Phase 1 trial, we expect to initiate a Phase 2 trial in adult subjects with RSV to evaluate antiviral activity, safety and PK in the second half of 2021.

Roche License Agreement

In October 2020, we entered into a license agreement, or the Roche License Agreement, with F. Hoffmann-La Roche Ltd and Genentech, Inc. in connection with AT-511, AT-527, their backup compounds (including AT-752), or the Compounds, products containing any Compound, or the Products, and related companion diagnostics, or the Companion Diagnostics.

Subject to the terms and conditions of the Roche License Agreement, we granted Roche (i) an exclusive, sublicensable, worldwide (excluding the United States) license to make, sell, import and export the Compounds, the Products and the Companion Diagnostics in all fields of use, except for certain hepatitis C virus use, or the Field, (ii) a non-exclusive, sublicensable license to make, import and export the Compounds, the Products and the Companion Diagnostics in the Field in the United States and (iii) a non-exclusive, sublicensable license to research and develop the Compounds, the Products and the Companion Diagnostics in the United States.

Subject to the terms and conditions of the Roche License Agreement, Roche granted us (i) an exclusive, sublicensable license to distribute, register and sell the Compounds and the Products in the United States, (ii) a non-exclusive, sublicensable license to research, develop, use, import, export and market the Compounds and the Products in the United States and (iii) a non-exclusive, sublicensable, worldwide (excluding the United States) license to research and develop the Compounds and the Products in the Field.

Subject to the terms and conditions of the Roche License Agreement, Roche and we will jointly develop certain Products on a worldwide-basis and equally share the costs associated with such development activities, which excludes those activities related to Retained Indications.

Subject to the terms of the Roche License Agreement, we retain the sole right at our expense to develop, manufacture and commercialize the Compounds and the Products in the United States, and to develop and manufacture the Compounds and the Products outside of the United States, in each case, for the treatment of Dengue Fever, Japanese Encephalitis, West Nile Virus, Yellow Fever and/or Zika, or the Retained Indications. The parties will negotiate in good faith an amendment to the Roche License Agreement pursuant to which Roche may commercialize Products indicated for one or more Retained Indications outside of the United States, unless Roche offers such commercialization right to us. Neither Roche nor we may commercialize such Products outside of the United States until the parties agree to an amendment to the Roche License Agreement.

Subject to the terms of the Roche License Agreement, we also have a one-time option to request that Roche co-promote the Products in the United States on a Product-by-Product basis, such option to be exercised by us prior to the expected regulatory approval of each applicable Product.

As partial consideration of the rights we granted to Roche under the Roche License Agreement, Roche will pay us an up front payment of $350 million in November 2020. The Roche License Agreement further provides that Roche is obligated to pay us up to $330 million in the aggregate upon the achievement of certain development or regulatory milestone events; up to $320 million in the aggregate upon the achievement of certain sales-based milestone events; and tiered royalties based on annual net sales of the Products, such royalty percentages ranging

between low double-digit and mid-twenties, subject to certain adjustments. Roche's obligation to pay us royalty payments will continue, on a country-by-country and Product-by-Product basis, until the later of (1) 10 years from the first commercial sale of a Product in a country and (2) expiration of the last to expire patent rights that we own or control containing a composition of matter claim covering such Product in such country.

The Roche License Agreement will remain in effect until the expiration of all payment obligations to us. Roche has the right to terminate the Roche License Agreement for convenience in its entirety or on a Product-by-Product or country-by-country basis, (x) upon three months' prior written notice if such notice is provided prior to the first commercial sale of the first Product and the parties are not conducting a certain prophylaxis study, in each case, pursuant to the terms of the Roche License Agreement, (y) if such notice is provided while the parties are conducting such prophylaxis study, upon the earlier of six months' prior written notice or the completion of such prophylaxis study, but in no event earlier than three months' prior written notice and (z) upon nine months' prior written notice if such notice is provided on or after the first commercial sale of the first Product pursuant to the terms of the Roche License Agreement. Each party has the right to terminate the Roche License Agreement (i) in its entirety or on a country-by-country basis for the other party's material breach of the terms of the Roche License Agreement, subject to a ninety-day cure period and (ii) for insolvency-related events involving the other party. Upon termination of the Roche License Agreement by Roche for the Company's material breach or insolvency, the rights and licenses granted by each party to the other party will terminate. Upon termination of the Roche License Agreement by Roche for convenience or by us for Roche's material breach, all rights and licenses granted by us to Roche will terminate, however, subject to the terms of the Roche License Agreement, we have the right to continue to develop and commercialize one or more terminated Products.

The Roche License Agreement also includes customary provisions regarding, among other things, confidentiality, intellectual property ownership, patent prosecution, enforcement and defense, representations and warranties, indemnification, insurance, and arbitration and dispute resolution.

Manufacturing

We do not currently own or operate manufacturing facilities for the production of preclinical or clinical product candidates, nor do we have plans to develop or operate our own manufacturing operations in the future. Pursuant to the Roche License Agreement, we will rely on Roche to manufacture the commercial supply of AT-527. We currently rely upon third-party contract manufacturing organizations, or CMOs, to produce our product candidates for both preclinical and clinical use. Although we rely on CMOs, we also have personnel with extensive manufacturing experience that can oversee the relationship with our manufacturing partners. We believe that any materials required for the manufacture of our product candidates could be obtained from more than one source.

Competition

As a clinical-stage biopharmaceutical company, we face competition from a wide array of companies in the pharmaceutical and biotechnology industries. These include both small companies and large companies with much greater financial and technical resources and far longer operating histories than our own. We may also compete with the intellectual property, technology, and product development efforts of academic, governmental, and private research institutions.

Our competitors may have significantly greater financial resources, established presence in the market, expertise in research and development, manufacturing, preclinical and clinical testing, obtaining regulatory approvals and reimbursement, and marketing approved products than we do. These competitors also compete with us in recruiting and retaining qualified scientific, sales, marketing, and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies

complementary to, or necessary for, our programs. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

The key competitive factors affecting the success of any product candidates that we develop, if approved, are likely to be their efficacy, safety, convenience, price, and the availability of reimbursement from government and other third-party payors. Our commercial opportunity for any of our product candidates could be reduced or eliminated if our competitors develop and commercialize products that are more effective, have fewer or less severe side effects, are more convenient, or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, and may commercialize products more quickly than we are able to.

We are aware of the following competitors in the areas that we are initially targeting:

SARS-CoV-2

Many therapies and vaccines are being investigated for the treatment of COVID-19, including:

- Remdesivir (Gilead Sciences, Inc.), a purine nucleotide prodrug, initially investigated for the treatment of Ebola virus, which has been approved for emergency use in the United States and received full approval in Japan.
- Favipiravir (Fujifilm Pharma Co., Ltd.), a nucleoside analog, first approved in Japan in 2014 for the treatment of emerging influenza strains and approved in 20[19/20] in Japan for the treatment of COVID-19.
- EIDD-2801 (Ridgeback Biotherapeutics LP/Merck & Co., Inc.), a nucleoside analog in Phase 1/2 clinical trials.
- REGN-COV2 (Regeneron Pharmaceuticals, Inc.), an antibody cocktail in a Phase 1/2/3 clinical trial.
- LY-CoV555 and LY-CoV016 (Eli Lilly and Co), a neutralizing antibody program for which Eli Lilly recently submitted an emergency use authorization request to the FDA.
- Additional companies working on investigational vaccines or treatments include Moderna, Inc., Inovio Pharmaceuticals, Inc., Vir Biotechnology Inc., Biogen Inc., Johnson & Johnson, Pfizer Inc., BioNTech SE - ADR, CanSino Biologics Inc, AbbVie Inc., Sanofi Pasteur Inc., AstraZeneca, Merck & Co., Inc., Eli Lilly and Co and Translate Bio Inc.

The potential treatments or vaccines for COVID-19 continues to evolve. The list above addresses the product candidates as of the date of this prospectus that we believe could be the most competitive with AT-527, but is not a comprehensive list of every treatment or vaccine that is in development for COVID-19.

HCV

FDA-approved treatments for patients with chronic HCV include Epclusa marketed by Gilead Sciences, Inc. and Mavyret, marketed by AbbVie Inc. We are also aware of an investigational agent for HCV, currently in Phase 2 testing, being developed by Cocrystal Pharma Inc.

Dengue Virus

At this time, there are no FDA- or EMA-approved treatments for dengue, and we are not aware of any potential therapeutics in development for treatment of dengue. Dengvaxia, marketed by Sanofi Pasteur, was approved in 2019 by the FDA for prevention of dengue in individuals ages nine to 16 with a laboratory-confirmed previous dengue infection and living in endemic areas. Takeda is also advancing TAK-003, which is in Phase 3 development, as a vaccine for dengue.

RSV

Supportive care is the most common course of care for RSV and includes oxygen, fluid management, bronchodilators, and corticosteroids. Ribavirin, approved in 1986, is used to treat severe cases of RSV infection, but carries significant side effects and risks associated with its use, especially in infants. Synagis (palivizumab), marketed by Swedish Orphan Biovitrum AB in the United States and AstraZeneca plc outside of the United States, is an FDA-approved, seasonal monoclonal antibody injection given monthly to help protect high-risk infants from severe RSV. Synagis is not approved as a treatment for RSV.

At this time, we are aware of investigational agents for the treatment of RSV being developed by Enanta Pharmaceuticals Inc., ReViral Ltd, and Ark Biosciences Inc.

Commercialization

Given the stage of development of our lead asset, we have not yet invested in a commercial infrastructure or distribution capabilities. While we currently plan to establish our own commercial organization in the United States and potentially in other selected markets, we continue to consider and evaluate in each market the potential advantages and enhancements of our commercial capabilities that may be realized as a result of a collaboration between us and a pharmaceutical or other company, as we have recently done through the Roche License Agreement. In connection with AT-527, we have a one-time option to request Roche co-promote AT-527 in the United States.

Intellectual Property

Our commercial success depends in part on our ability to obtain and maintain proprietary protection for our nucleotide therapeutic products for viral diseases, including our purine nucleotide compounds for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), hepatitis C (HCV) and dengue fever. We seek to protect our proprietary compounds and methods of treatment for viral diseases using our nucleotide compounds, alone and in combination with other therapeutic agents, in addition to dosage forms, dosing regimens and formulations for their administration. We also seek protection on the manufacturing process for the production of our nucleotide compounds. Our success also depends on our ability to operate without infringing, misappropriating or otherwise violating on the proprietary rights of others and to prevent others from infringing, misappropriating or otherwise violating our proprietary rights.

Our policy is to seek to protect our proprietary position by filing U.S. and foreign patent applications covering our proprietary technologies, inventions, and improvements that are important to the development and implementation of our business. In addition, we currently plan to seek patent term adjustments, restorations, and/or patent term extensions where applicable in the United States, Europe and other jurisdictions. We also rely on trade secrets, know-how, continuing technological innovation and potential in-licensing opportunities to develop and maintain our proprietary position. Additionally, we expect to benefit, where appropriate, from statutory frameworks in the United States, Europe and other countries that provide a period of regulatory data exclusivity to compensate for the time required for regulatory approval of our drug products.

As of September 30, 2020, we are the sole owner of eight patent families covering our product candidates and proprietary nucleotide compounds, which include composition of matter, pharmaceutical compositions, methods of use, and processes of manufacture as described in more detail below. Our owned patent estate as of September 30, 2020, on a worldwide basis, includes 117 granted or pending patent applications with five issued U.S. patents, one allowed U.S. non-provisional application, ten pending U.S. non-provisional applications, 11 pending U.S. provisional applications, two pending international patent applications filed under the Patent Cooperation Treaty, or PCT, and 88 pending or granted patent applications that have entered the national phase of prosecution in countries outside the United States.

The exclusivity terms of our patents depend upon the laws of the countries in which they are obtained. In the countries in which we currently file, the patent term is 20 years from the earliest date of filing of a non-provisional patent application. The term of a U.S. patent may be extended to compensate for the time required to obtain regulatory approval to sell a drug (a patent term extension) or by delays encountered during patent prosecution that are caused by the USPTO (referred to as patent term adjustment). For example, the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Act, permits a patent term extension for FDA-approved new chemical entity drugs of up to five years beyond the expiration of the patent. The length of the patent term extension is related to the length of time the drug is under regulatory review and diligence during the review process. Patent term extensions in the United States cannot extend the term of a patent beyond a total of 14 years from the date of product approval, only one patent covering an approved drug or its method of use may be extended, and only those claims covering the approved drug, a method for using it, or a method for manufacturing it may be extended. A similar kind of patent extension, referred to as a Supplementary Protection Certificate, is available in Europe. Legal frameworks are also available in certain other jurisdictions to extend the term of a patent. We currently intend to seek patent term extensions on any of our issued patents in any jurisdiction where we have a qualifying patent and the extension is available; however, there is no guarantee that the applicable regulatory authorities, including the FDA in the United States, will agree with our assessment of whether such extensions should be granted, and even if granted, the length of such extensions. Further, even if our patent is extended, the patent, including the extended portion of the patent, may be held invalid or unenforceable by a court of final jurisdiction in the United States or a foreign country.

Current issued patents and patent applications covering the composition of matter for our present clinical candidates AT-511, AT-527, AT-281 (the free base of AT-752), and AT-752 will expire on dates ranging from 2036 to 2038, if the applications are issued and held valid by a court of final jurisdiction if challenged. Current patent applications covering the use of AT-511 and AT-527 for the treatment of SARS-CoV-2 will expire on dates ranging from 2037 to 2041, if the applications (including non-provisional applications filed on the basis of provisional applications) are issued and held valid by a court of final jurisdiction if challenged. Current issued patents and patent applications covering the use of AT-511 and AT-527 for the treatment of HCV will expire on dates ranging from 2036 to 2039, if the applications are issued and held valid by a court of final jurisdiction if challenged. Current patent applications covering the use of AT-281 and AT-752 for the treatment of dengue fever will expire on a date in 2037, if the applications are issued and held valid by a court of final jurisdiction if challenged.

Current patent applications covering the composition of matter for our present HCV combination drug clinical candidate AT-787 will expire on a date in 2039, if the applications are issued and held valid by a court of final jurisdiction if challenged. Current patent applications covering the use of AT-787 for the treatment of HCV will expire on dates ranging from 2036 to 2039, if the applications are issued and held valid by a court of final jurisdiction if challenged.

However, any of our patents, including patents that we may rely on to protect our market for approved products, may be held invalid or unenforceable by a court of final jurisdiction. Alternatively, we may decide that it is in our interest to settle a litigation in a manner that affects the term or enforceability of our patent. Changes in either the patent laws or in interpretations of patent laws in the United States and other jurisdictions may diminish our ability to protect our inventions and enforce our intellectual property rights. Accordingly, we cannot predict the breadth or enforceability of claims that have been or may be granted on our patents or on third-party patents. The pharmaceutical and biotechnology industries are characterized by extensive litigation regarding patents and other intellectual property rights. Our ability to obtain and maintain our proprietary position for our nucleotide compounds and the use of these compounds will depend on our success in enforcing patent claims that have been granted or may grant. We do not know whether any of the pending patent applications that we have filed or may file or license from third parties will result in the

issuance of any additional patents. The issued patents that we own or may receive in the future may be challenged, invalidated, or circumvented, and the rights granted under any issued patents may not provide us with sufficient protection or competitive advantages against competitors with similar technology. Furthermore, our competitors may be able to independently develop and commercialize drugs with similar mechanisms of action and/or duplicate our methods of treatments or strategies without infringing our patents. Because of the extensive time required for clinical development and regulatory review of a drug we may develop, it is possible that, before any of our drugs can be commercialized, any related patent may expire or remain in force for only a short period following commercialization, thereby reducing any advantage of any such patent. For more information regarding risks relating to intellectual property, see "Risk Factors—Risks Related to Intellectual Property."

Our patent families, as of September 30, 2020, are further described below.

AT-511 and AT-527

We own a first patent family that describes AT-511 or a pharmaceutically acceptable salt thereof (for example, AT-527), pharmaceutical compositions of AT-511 or the pharmaceutical salts thereof, and methods to treat HCV using AT-511 or a salt thereof. This family consists of four issued U.S. patents (U.S. Pat. Nos. 9,828,410; 10,000,523; 10,005,811; and 10,239,911), on allowed U.S. application and four pending U.S. applications covering AT-511 or a pharmaceutically acceptable salt thereof and its pharmaceutical compositions. This patent family is now also in the national stage of prosecution in the African Regional Intellectual Property Organization, or ARIPO, Australia, Brazil, Canada, China, Colombia, the Eurasian Patent Office, or EAPO, Egypt, the European Patent Office, or EPO, Georgia, Hong Kong, Indonesia, Israel, India, Japan, Korea, Mexico, Malaysia, Nigeria, New Zealand, the Philippines, Russia, Saudi Arabia, Singapore, Thailand, Vietnam, Ukraine, South Africa, and the United Arab Emirates. The expected year of expiration for this patent family, where issued, valid and enforceable, is 2036, without regard to any extensions, adjustments, or restorations of term that may be available under national law.

We also own a second patent family that specifically covers AT-527, pharmaceutical compositions, and methods to treat HCV using AT-527. This family includes one issued U.S. patent (U.S. Pat. No. 10,519,186) and two pending U.S. applications covering AT-527, pharmaceutical compositions, and methods to treat HCV using AT-527. This family is currently in the national phase of prosecution in Argentina, ARIPO, Australia, Brazil, Canada, China, Colombia, the EAPO, the EPO, Georgia, Hong Kong, Indonesia, Israel, India, Japan, Korea, Mexico, Malaysia, Nigeria, New Zealand, the Philippines, Russia, Singapore, Taiwan, Thailand, Vietnam, Ukraine, Uzbekistan, and South Africa. The expected year of expiration for this patent family, if issued, valid and enforceable, is 2038, without regard to any extensions, adjustments, or restorations of term that may be available under U.S. or other national laws.

We own a third patent family that discloses methods for the treatment of SARS-CoV-2 using AT-511 or AT-527. This family includes seven provisional U.S. applications. The expected year of expiration for patents issued from non-provisional patent applications filed on the basis of these provisional patent applications, if valid and enforceable, is 2041, without regard to any extensions, adjustments, or restorations of term that may be available under U.S. or other national laws. We have recently filed a U.S. normal application with the U.S. PTO under its COVID-19 Prioritized Examination Pilot Program to advance out of turn patent applications covering methods to treat COVID-19 that are currently under review by the FDA. Our Petition was granted by the PTO on September 23, 2020.

We own a fourth patent family that discloses the use of AT-511 or a pharmaceutically acceptable salt thereof for the treatment or prevention of a positive-stranded RNA virus infection, including a *Coronaviridae* viral infection. This family consists of two pending U.S. applications and is currently in the national phase of prosecution in

Australia, Brazil, Canada, China, the EAPO, the EPO, Hong Kong, Indonesia, Japan, Korea, Malaysia, Nigeria, Russia, Singapore, Thailand, Vietnam, and South Africa. The expected year of expiration for this patent family, if issued, valid and enforceable, is 2037, without regard to any extensions, adjustments, or restorations of term that may be available under U.S. or other national laws.

We own a fifth patent family that discloses the use of AT-511 and AT-527 for the treatment of HCV in patients with cirrhosis of the liver. This family includes one international application filed under the PCT (PCT/US19/26837), one patent application filed in Taiwan, and one application filed in Europe. The expected year of expiration for this patent family, if issued, valid and enforceable, is 2039, without regard to any extensions, adjustments, or restorations of term that may be available under U.S. or other national laws.

We also own a sixth patent family that discloses methods for manufacturing AT-511 and AT-527. This family consists of two provisional U.S. applications. The expected year of expiration for patents issued from non-provisional patent applications filed on the basis of these provisional patent applications, if valid and enforceable, is 2041, without regard to adjustments of term that may be available under U.S. or other national laws.

We also own a seventh patent family that discloses new commercial scale processes for the manufacture of AT-511 and AT-527. This family consists of two U.S. provisional applications. The expected year of expiration for patents issuing from these non-provisional patent applications, if valid and enforceable, is 2041, without regard to any adjustments of term that may be available under U.S. or other national law.

AT-787

We own an eighth patent family that discloses the combination of AT-511 or AT-527 and AT-777 (i.e., AT-787) for the treatment of HCV. This family includes one pending U.S. application, one international application filed under the PCT (PCT/US19/64522), one patent application in Taiwan, and one patent application in Argentina. The expected year of expiration for this patent family, if issued, valid and enforceable, is 2039, without regard to any extensions, adjustments, or restorations of term that may be available under U.S. or other national laws.

AT-281 and AT-752

The first patent family described above also describes AT-281, a pharmaceutically acceptable salt thereof (for example, AT-752) and pharmaceutical compositions of AT-281 or a pharmaceutical salt thereof and their use to treat HCV infection.

The second patent family described above also describes AT-752 and pharmaceutical compositions of AT-752. One of these pending U.S. application in this patent family covers AT-752 and pharmaceutical compositions of AT-752.

The fourth patent family described above also includes a disclosure of the use of AT-281 or a pharmaceutically acceptable salt thereof for the treatment or prevention of an RNA viral infection, including dengue fever, yellow fever, and Zika virus in addition to the treatment and prevention of a *Coronaviridae* viral infection. Therefore, we have three patent families that describe AT-281 or AT-752 and methods of treatment for viral infections using AT-281 or AT-752.

Government Regulation and Product Approval

Government authorities in the United States, at the federal, state and local level, and other countries extensively regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, marketing and export and import of products such as those we are developing. A new drug must be approved by the FDA through the new drug application, or NDA, process before it may be legally marketed in the United States.

U.S. drug development process

In the United States, the FDA regulates drugs under the FDCA and its implementing regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval may subject an applicant to administrative or judicial sanctions. These sanctions could include the FDA's refusal to approve pending applications, withdrawal of an approval, a clinical hold, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

The process required by the FDA before a drug may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests, animal studies and formulation studies in accordance with FDA's good laboratory practice requirements and other applicable regulations;
- submission to the FDA of an IND, which must become effective before human clinical trials may begin;
- approval by an independent institutional review board, or IRB, or ethics committee at each clinical site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with good clinical practice requirements, or GCPs to establish the safety and efficacy of the proposed drug for its intended use;
- submission to the FDA of an NDA after completion of all pivotal trials;
- satisfactory completion of an FDA advisory committee review, if applicable;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the drug is produced to assess compliance with current good manufacturing practice, or cGMP, requirements to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity, and of selected clinical investigation sites to assess compliance with GCPs; and
- FDA review and approval of the NDA to permit commercial marketing of the product for particular indications for use in the United States.

Prior to beginning the first clinical trial with a product candidate in the United States, we must submit an IND to the FDA. An IND is a request for authorization from the FDA to administer an IND product to humans. The central focus of an IND submission is on the general investigational plan and the protocol(s) for clinical studies. The IND also includes results of animal and *in vitro* studies assessing the toxicology, pharmacokinetics, pharmacology, and pharmacodynamic characteristics of the product; chemistry, manufacturing, and controls information; and any available human data or literature to support the use of the investigational product. An IND must become effective before human clinical trials may begin. Once submitted, the IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30- day time period, raises safety concerns or questions about the proposed clinical trial. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before the clinical trial can begin. Submission of an IND therefore may or may not result in FDA authorization to begin a clinical trial.

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with GCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical study. Clinical trials are conducted under

protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A separate submission to the existing IND must be made for each successive clinical trial conducted during product development and for any subsequent protocol amendments. Furthermore, an independent IRB for each site proposing to conduct the clinical trial must review and approve the plan for any clinical trial and its informed consent form before the clinical trial begins at that site and must monitor the study until completed. Regulatory authorities, the IRB or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk or that the trial is unlikely to meet its stated objectives. Some studies also include oversight by an independent group of qualified experts organized by the clinical study sponsor, known as a data safety monitoring board, which provides authorization for whether or not a study may move forward at designated check points based on access to certain data from the study and may halt the clinical trial if it determines that there is an unacceptable safety risk for subjects or other grounds, such as no demonstration of efficacy. There are also requirements governing the reporting of ongoing clinical studies and clinical study results to public registries.

Human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

- *Phase 1:* The product candidate is initially introduced into healthy human subjects, in some cases, patients with the target disease or condition. These studies are designed to test the safety, dosage tolerance, absorption, metabolism and distribution of the investigational product in humans, the side effects associated with increasing doses, and, if possible, to gain early evidence on effectiveness.
- *Phase 2:* The product candidate is administered to a limited patient population with a specified disease or condition to evaluate the preliminary efficacy, optimal dosages and dosing schedule and to identify possible adverse side effects and safety risks. Multiple Phase 2 clinical trials may be conducted to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.
- *Phase 3:* The product candidate is administered to an expanded patient population to further evaluate dosage, to provide statistically significant evidence of clinical efficacy and to further test for safety, generally at multiple geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the investigational product and to provide an adequate basis for product approval.

Post-approval trials, sometimes referred to as Phase 4 studies, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval of an NDA.

The FDA or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients.

During the development of a new drug, sponsors are given opportunities to meet with the FDA at certain points. These points may be prior to submission of an IND, at the end of Phase 2, and before an NDA is submitted. Meetings at other times may be requested. These meetings can provide an opportunity for the sponsor to share information about the data gathered to date, for the FDA to provide advice, and for the sponsor and the FDA to reach agreement on the next phase of development. Sponsors typically use the meetings at the end of the Phase 2 trial to discuss Phase 2 clinical results and present plans for the pivotal Phase 3 clinical trials that they believe will support approval of the new drug.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the manufacturer must develop methods for testing the identity, strength, quality and purity of the final drug. In addition, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

While the IND is active and before approval, progress reports summarizing the results of the clinical trials and nonclinical studies performed since the last progress report must be submitted at least annually to the FDA, and written IND safety reports must be submitted to the FDA and investigators for serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the same or similar drugs, findings from animal or *in vitro* testing suggesting a significant risk to humans, and any clinically important increased incidence of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure.

U.S. review and approval process

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, the results of product development, preclinical and other non-clinical studies and clinical trials, along with descriptions of the manufacturing process, analytical tests conducted on the chemistry of the drug, proposed labeling and other relevant information are submitted to the FDA as part of an NDA requesting approval to market the product. The submission of an NDA is subject to the payment of substantial user fees; a waiver of such fees may be obtained under certain limited circumstances. Additionally, no user fees are assessed on NDAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

The FDA reviews an NDA to determine, among other things, whether a product is safe and effective for its intended use and whether its manufacturing is cGMP-compliant to assure and preserve the product's identity, strength, quality and purity. Under the Prescription Drug User Fee Act, or PDUFA, guidelines that are currently in effect, the FDA has a goal of ten months from the date of "filing" of a standard NDA for a new molecular entity to review and act on the submission. This review typically takes twelve months from the date the NDA is submitted to FDA because the FDA has approximately two months to make a "filing" decision after it the application is submitted. The FDA conducts a preliminary review of all NDAs within the first 60 days after submission, before accepting them for filing, to determine whether they are sufficiently complete to permit substantive review The FDA may request additional information rather than accept an NDA for filing. In this event, the NDA must be resubmitted with the additional information. The resubmitted application also is subject to review before the FDA accepts it for filing.

The FDA may refer an application for a novel drug to an advisory committee. An advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving an NDA, the FDA will typically inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP and adequate to assure consistent production of the product within required specifications. Additionally, before approving a NDA, the FDA will typically inspect one or more clinical sites to assure compliance with GCPs. If the FDA determines that the application, manufacturing process or

manufacturing facilities are not acceptable, it will outline the deficiencies in the submission and often will request additional testing or information. Notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

After the FDA evaluates an NDA, it will issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug with prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete, and the application will not be approved in its present form. A Complete Response Letter usually describes the specific deficiencies in the NDA identified by the FDA and may require additional clinical data, such as an additional clinical trials or other significant and time-consuming requirements related to clinical trials, nonclinical studies or manufacturing. If a Complete Response Letter is issued, the sponsor must resubmit the NDA or, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the NDA does not satisfy the criteria for approval.

If regulatory approval of a product is granted, such approval will be granted for particular indications and may entail limitations or restrictions on the indicated uses for which such product may be marketed. For example, the FDA may approve the NDA with a Risk Evaluation and Mitigation Strategy, or REMS, to ensure the benefits of the product outweigh its risks. A REMS is a safety strategy to manage a known or potential serious risk associated with a medicine and to enable patients to have continued access to such medicines by managing their safe use, and could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries, and other risk minimization tools. The FDA also may condition approval on, among other things, changes to proposed labeling or the development of adequate controls and specifications. Once approved, the FDA may withdraw the product approval if compliance with pre- and post-marketing requirements is not maintained or if problems occur after the product reaches the marketplace. The FDA may also require one or more Phase 4 post-market studies and surveillance to further assess and monitor the product's safety and effectiveness after commercialization, and may limit further marketing of the product based on the results of these post-marketing studies. In addition, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could impact the timeline for regulatory approval or otherwise impact ongoing development programs.

In addition, the Pediatric Research Equity Act, or PREA, requires a sponsor to conduct pediatric clinical trials for most drugs, for a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration. Under PREA, original NDAs and supplements must contain a pediatric assessment unless the sponsor has received a deferral or waiver. The required assessment must evaluate the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The sponsor or FDA may request a deferral of pediatric clinical trials for some or all of the pediatric subpopulations. A deferral may be granted for several reasons, including a finding that the drug is ready for approval for use in adults before pediatric clinical trials are complete or that additional safety or effectiveness data needs to be collected before the pediatric clinical trials begin. The FDA must send a non-compliance letter to any sponsor that fails to submit the required assessment, keep a deferral current or fails to submit a request for approval of a pediatric formulation.

Expedited development and review programs

The FDA has a fast track designation program that is intended to expedite or facilitate the process for reviewing new drug products that meet certain criteria. Specifically, new drugs are eligible for Fast Track designation if

they are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. With regard to a fast track product, the FDA may consider for review sections of the NDA on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA, the FDA agrees to accept sections of the NDA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA.

Any product submitted to the FDA for approval, including a product with a fast track designation, may also be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. A drug is eligible for priority review if it is designed to treat a serious condition, and if approved, would provide a significant improvement in safety or effectiveness compared to marketed products. The FDA will attempt to direct additional resources to the evaluation of an application for a new drug designated for priority review in an effort to facilitate the review. The FDA endeavors to review applications with priority review designations within six months of the filing date as compared to ten months for review of new molecular entity NDAs under its current PDUFA review goals.

In addition, a product may be eligible for accelerated approval. Drug products intended to treat serious or life-threatening diseases or conditions may be eligible for accelerated approval upon a determination that the product has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. As a condition of approval, the FDA may require that a sponsor of a drug receiving accelerated approval perform adequate and well-controlled post-marketing clinical trials to verify the predicted clinical benefit. Products receiving accelerated approval may be subject to expedited withdrawal procedures if the sponsor fails to conduct the required clinical trials, or if such trials fail to verify the predicted clinical benefit. In addition, the FDA currently requires pre-approval of promotional materials as a condition for accelerated approval, which could adversely impact the timing of the commercial launch of the product.

The Food and Drug Administration Safety and Innovation Act established a category of drugs referred to as “breakthrough therapies” that may be eligible to receive breakthrough therapy designation. A sponsor may seek FDA designation of a product candidate as a “breakthrough therapy” if the product is intended, alone or in combination with one or more other products, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The designation includes all of the fast track program features, as well as more intensive FDA interaction and guidance. The breakthrough therapy designation is a distinct status from both accelerated approval and priority review, which can also be granted to the same drug if relevant criteria are met. If a product is designated as breakthrough therapy, the FDA will work to expedite the development and review of such drug.

Fast track designation, breakthrough therapy designation, priority review and accelerated approval do not change the standards for approval but may expedite the development or approval process. Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Tropical Disease Priority Review Voucher Program

In 2007, Congress authorized the FDA to award priority review vouchers, or PRVs, to sponsors of certain tropical disease product applications. The FDA’s Tropical Disease Priority Review Voucher Program is designed

to encourage development of new drug and biological products for the prevention and treatment of certain tropical diseases affecting millions of people throughout the world. Under this program, a sponsor who receives an approval for a drug or biologic for the prevention or treatment a tropical disease that meets certain criteria may qualify for a PRV that can be redeemed to receive priority review of a subsequent NDA or Biologics License Application, or BLA, for a different product. The sponsor of a topical disease drug product receiving a priority review voucher may transfer (including by sale) the voucher to another sponsor of an NDA or BLA. The FDCA does not limit the number of times a priority review voucher may be transferred before the voucher is used.

For a product to qualify for a PRV, (i) the sponsor must request approval of the product for the prevention or treatment of a “tropical disease” listed in Section 524 of the FDCA, (ii) the product must otherwise qualify for priority review, and (iii) the product must contain no active ingredient (including any salt or ester of an active ingredient) that has been approved by the FDA in any other NDA or BLA. The Food and Drug Administration Reauthorization Act of 2017 made further changes to the eligibility criteria for receipt of a tropical disease PRV under this program. Specifically, applications submitted after September 30, 2017 must also contain reports of one or more new clinical investigations (other than bioavailability studies) that were essential to the approval of the application and conducted or sponsored by the sponsor. We are currently developing AT-752 for the treatment of Dengue, which is listed in Section 524 of the FDCA as a disease qualifying for a tropical disease PRV. Accordingly, if AT-752 is approved by the FDA for the prevention or treatment of Dengue, we may receive a tropical disease PRV, provided that AT-752 otherwise meets the statutory criteria for receipt.

Post-approval requirements

Any products manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to record-keeping, reporting of adverse experiences, periodic reporting, product sampling and distribution, and advertising and promotion of the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims, are subject to prior FDA review and approval. There also are continuing, annual program fees for any marketed products.

Drug manufacturers and their subcontractors are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP, which impose certain procedural and documentation requirements upon drug manufacturers. Changes to the manufacturing process are strictly regulated, and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting requirements upon us and any third-party manufacturers that we may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information, imposition of post-market studies or clinical studies to assess new safety risks, or imposition of distribution restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;

- fines, warning letters, or untitled letters;
- clinical holds on clinical studies;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of product approvals;
- product seizure or detention, or refusal to permit the import or export of products;
- consent decrees, corporate integrity agreements, debarment or exclusion from federal healthcare programs;
- mandated modification of promotional materials and labeling and the issuance of corrective information;
- the issuance of safety alerts, Dear Healthcare Provider letters, press releases and other communications containing warnings or other safety information about the product; or
- injunctions or the imposition of civil or criminal penalties.

The FDA closely regulates the marketing, labeling, advertising and promotion of drug products. A company can make only those claims relating to safety and efficacy, purity and potency that are approved by the FDA and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off label uses. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. Physicians may prescribe, in their independent professional medical judgment, legally available products for uses that are not described in the product's labeling and that differ from those tested and approved by the FDA. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, restrict marketers' communications on the subject of off-label use of their products. The federal government has levied large civil and criminal fines against companies for alleged improper promotion of off-label use and has enjoined companies from engaging in off-label promotion. The FDA and other regulatory agencies have also required that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed. However, companies may share truthful and not misleading information that is otherwise consistent with a product's FDA-approved labelling.

Marketing exclusivity

Market exclusivity provisions authorized under the FDCA can delay the submission or the approval of certain marketing applications. The FDCA provides a five-year period of non-patent marketing exclusivity within the United States to the first applicant to obtain approval of an NDA for a new chemical entity. A drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance. During the exclusivity period, the FDA may not approve or even accept for review an abbreviated new drug application, or ANDA, or an NDA submitted under Section 505(b)(2), or 505(b)(2) NDA, submitted by another company for another drug based on the same active moiety, regardless of whether the drug is intended for the same indication as the original innovative drug or for another indication, where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement to one of the patents listed with the FDA by the innovator NDA holder.

The FDCA alternatively provides three years of marketing exclusivity for an NDA, or supplement to an existing NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example new

indications, dosages or strengths of an existing drug. This three-year exclusivity covers only the modification for which the drug received approval on the basis of the new clinical investigations and does not prohibit the FDA from approving ANDAs or 505(b)(2) NDAs for drugs containing the active agent for the original indication or condition of use. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to any preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

Pediatric exclusivity is another type of marketing exclusivity available in the United States. Pediatric exclusivity provides for an additional six months of marketing exclusivity attached to another period of exclusivity if a sponsor conducts clinical trials in children in response to a written request from the FDA. The issuance of a written request does not require the sponsor to undertake the described clinical trials. In addition, orphan drug exclusivity, as described above, may offer a seven-year period of marketing exclusivity, except in certain circumstances.

Other Healthcare Laws

Pharmaceutical companies are subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which they conduct their business. Such laws include, without limitation, U.S. federal and state anti-kickback, fraud and abuse, false claims, pricing reporting, data privacy and security, and physician payment transparency laws and regulations as well as similar foreign laws in the jurisdictions outside the United States. Violation of any of such laws or any other governmental regulations that apply may result in significant penalties, including, without limitation, administrative civil and criminal penalties, damages, disgorgement fines, additional reporting requirements and oversight obligations, contractual damages, the curtailment or restructuring of operations, exclusion from participation in governmental healthcare programs and/ or imprisonment.

Coverage and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any product candidate for which we may seek regulatory approval. Sales in the United States will depend, in part, on the availability of sufficient coverage and adequate reimbursement from third-party payors, which include government health programs such as Medicare, Medicaid, TRICARE and the Veterans Administration, as well as managed care organizations and private health insurers. Prices at which we or our customers seek reimbursement for our product candidates can be subject to challenge, reduction or denial by third-party payors.

The process for determining whether a third-party payor will provide coverage for a product is typically separate from the process for setting the reimbursement rate that the payor will pay for the product. In the United States, there is no uniform policy among payors for coverage or reimbursement. Decisions regarding whether to cover any of a product, the extent of coverage and amount of reimbursement to be provided are made on a plan-by-plan basis. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own coverage and reimbursement policies, but also have their own methods and approval processes. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. As a result, the coverage determination process is often a time-consuming and costly process that can require manufacturers to provide scientific and clinical support for the use of a product to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance.

Third-party payors are increasingly challenging the price and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. Adoption of price

controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit sales of any product that receives approval. Third-party payors may not consider our product candidates to be medically necessary or cost-effective compared to other available therapies, or the rebate percentages required to secure favorable coverage may not yield an adequate margin over cost or may not enable us to maintain price levels sufficient to realize an appropriate return on our investment in drug development. Additionally, decreases in third-party reimbursement for any product or a decision by a third-party payor not to cover a product could reduce physician usage and patient demand for the product.

U.S. Healthcare Reform

In the United States, there has been, and continues to be, several legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of product candidates, restrict or regulate post-approval activities, and affect the profitable sale of product candidates.

Among policy makers and payors in the United States, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives. In March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act (collectively, the ACA) was passed, which substantially changed the way healthcare is financed by both governmental and private insurers, and significantly affected the pharmaceutical industry. The ACA increased the minimum level of Medicaid rebates payable by manufacturers of brand name drugs from 15.1% to 23.1%; required collection of rebates for drugs paid by Medicaid managed care organizations; required manufacturers to participate in a coverage gap discount program, in which manufacturers must agree to offer point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; imposed a non-deductible annual fee on pharmaceutical manufacturers or importers who sell certain "branded prescription drugs" to specified federal government programs, implemented a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted, or injected; expanded eligibility criteria for Medicaid programs; created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; and established a Center for Medicare Innovation at the CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

There remain judicial and political challenges to certain aspects of the ACA. For example, the Tax Cuts and Jobs Act of 2017 (Tax Act) includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." On December 14, 2018, a U.S. District Court Judge in the Northern District of Texas, or the Texas District Court Judge, ruled that the individual mandate is a critical and inseverable feature of the ACA, and therefore, because it was repealed as part of the Tax Act, the remaining provisions of the ACA are invalid as well. On December 18, 2019, the U.S. Court of Appeals for the 5th Circuit affirmed the District Court's decision that the individual mandate was unconstitutional but remanded the case back to the District Court to determine whether the remaining provisions of the ACA are invalid as well. On March 2, 2020, the United States Supreme Court granted the petitions for writs of certiorari to review this case, although it remains unclear how and when the Court will make a decision. In addition, it is unclear how any other efforts to repeal, replace or challenge the ACA will impact the law.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. These changes included aggregate reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the Bipartisan Budget Act of 2018, will remain in effect through 2029 unless additional Congressional action is taken. The Coronavirus Aid, Relief, and Economic Security Act, or CARES Act, was signed into law on March 27, 2020 and suspended these reductions from May 1, 2020 through December 31, 2020 due to the COVID-19 pandemic, and extended the sequester by one year, through 2030. In addition, on January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Moreover, there has recently been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for pharmaceutical products. At the federal level, the current U.S. administration's budget proposal for the fiscal year 2021 includes a $135 billion allowance to support legislative proposals seeking to reduce drug prices, increase competition, lower out-of-pocket drug costs for patients, and increase patient access to lower-cost generic and biosimilar drugs. On March 10, 2020, the Trump administration sent "principles" for drug pricing to Congress, calling for legislation that would, among other things, cap Medicare Part D beneficiary out-of-pocket pharmacy expenses, provide an option to cap Medicare Part D beneficiary monthly out-of-pocket expenses, and place limits on pharmaceutical price increases. The Trump Administration previously released a "Blueprint" to lower drug prices and reduce out of pocket costs of drugs that contained proposals to increase manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products and reduce the out of pocket costs of pharmaceutical products paid by consumers. Although a number of these and other measures may require additional authorization to become effective, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs.

Individual states in the United States have also become increasingly active in implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine which drugs and suppliers will be included in their healthcare programs Furthermore, there has been increased interest by third party payors and governmental authorities in reference pricing systems and publication of discounts and list prices.

Employees

As of September 30, 2020, we had 19 full-time employees, including eight employees with M.D. or Ph.D. degrees. Of these full-time employees, 11 employees are engaged in research and development activities. None of our employees is represented by a labor union or covered by a collective bargaining agreement. We consider our relationship with our employees to be good.

Facilities

Our principal office is located at 125 Summer Street, Boston, Massachusetts, where we lease 5,634 square feet of office space. We lease this space under a lease agreement, as amended, that terminates on July 31, 2022. We

believe that our facilities are sufficient to meet our current needs and that suitable additional space will be available as and when needed.

Legal Proceedings

We are not subject to any material legal proceedings.

MANAGEMENT

Executive Officers and Directors

The following table sets forth the name, age and position of each of our executive officers and directors as of the date of this prospectus.

Name	Age	Position
Executive Officers		
Jean-Pierre Sommadossi, Ph.D.	64	President and Chief Executive Officer and Chairman of the Board of Directors
Andrea Corcoran	58	Chief Financial Officer, Executive Vice President, Legal and Secretary
Janet Hammond, M.D., Ph.D.	60	Chief Development Officer
Maria Arantxa Horga, M.D.	51	Acting Chief Medical Officer
John Vavricka	56	Chief Commercial Officer
Wayne Foster	52	Senior Vice President, Finance and Administration
Directors		
Franklin Berger	70	Director
Grigory Borisenko, Ph.D. (4)	51	Director
Bihua Chen (4)	52	Director
Isaac Cheng, M.D.	45	Director
Andrew Hack, M.D., Ph.D.	47	Director
Bruno Lucidi	60	Director
Polly A. Murphy, D.V.M., Ph.D.	56	Director
Bruce Polsky, M.D.	66	Director

(1) Member of the audit committee.

(2) Member of the compensation committee.

(3) Member of the nominating and corporate governance committee.

(4) Dr. Borisenko and Ms. Chen will resign from our board of directors effective upon the effectiveness of the registration statement relating to this offering.

Executive Officers

Jean-Pierre Sommadossi, Ph.D., is the founder of our company and has served as our President and Chief Executive Officer and as Chairman of our Board since July 2012. Prior to that, he co-founded and held several roles at Idenix Pharmaceuticals, Inc., a biopharmaceutical company, from 1998 to 2010, including Principal Founder and Chief Executive Officer and Chairman. Dr. Sommadossi also co-founded Pharmasset, a biopharmaceutical company, in 1998. Dr. Sommadossi has also served as the Chairman of the board of directors of Kezar Life Sciences, Inc., a biopharmaceutical company, since June 2015, Vice Chair of the board of directors of Rafael Pharmaceuticals, Inc. a biopharmaceutical company, since 2016, Chairman of the board of directors of Panchrest, Inc., a marketing authorized representative in healthcare, since 2013, Chairman of the board of

directors of PegaOne, a biopharmaceutical company since 2019, a member the board of directors of The BioExec Institute and as member of the Harvard Medical School Discovery Council since 2010. Dr. Sommadossi received his Ph.D. and Pharm.D. degrees from the University of Marseilles in France. We believe that Dr. Sommadossi's extensive scientific, operational, strategic and management experience in the biotech industry qualifies him to serve on our Board.

Andrea Corcoran has served as our Chief Financial Officer since October 2020, our corporate Secretary since September 2014 and our Executive Vice President, Legal and Administration since December 2013. Prior to joining us, Ms. Corcoran served as Senior Vice President, Strategy and Finance at iBio, Inc., a biotechnology company, from 2011 to 2012, as General Counsel and Secretary at Tolerx, Inc., a biopharmaceutical company, from 2007 to 2011, and as Executive Vice President of Idenix Pharmaceuticals, Inc. from 1998 to 2007. Ms. Corcoran received her J.D. from Boston College Law School and her B.S. from Providence College.

Janet Hammond, M.D., Ph.D., has served as our Chief Development Officer since August 2020. Prior to joining us, Dr. Hammond served at AbbVie, Inc., a biopharmaceutical company, from November 2016 to August 2020 as Vice President and Therapeutic Area Head for General Medicine and Infectious Disease Development and at F. Hoffmann-La Roche from March 2011 to November 2016 as Senior Vice President, Global Head of Infectious Diseases and Head of Pharmaceutical Research and Early Development China. Dr. Hammond received her M.D. and Ph.D. from the University of Cape Town, South Africa, and her Sc.M. in Clinical Investigation from Johns Hopkins University School of Hygiene and Public Health.

Maria Arantxa Horga, M.D., has served as our Acting Chief Medical Officer since October 2020 and as Executive Vice President, Clinical Sciences since August 2020. Prior to joining us, Dr. Horga served as Vice President, Pharmacovigilance and Medical Affairs at Biohaven Pharmaceuticals from October 2019 to August 2020. Prior to that, Dr. Horga served as Vice President, Global Head of Clinical Program Execution, Site Head of the Roche NY Innovation Center from July 2017 to August 2019, and as Global Head of Translational Medicine, Infectious Diseases at F. Hoffmann-La Roche from 2012 to 2016. Dr. Horga received her M.D. from the Santander School of Medicine, and completed her residency in Pediatrics and a fellowship in Pediatric Infectious Diseases at the Mount Sinai School of Medicine.

John Vavricka has served as our Chief Commercial Officer since October 2018. Prior to joining us, Mr. Vavricka cofounded Biothea Pharma, Inc., a biotechnology company, in 2015, and was the Founder, Chief Executive Officer and President of Iroko Pharmaceuticals, Inc., a global pharmaceuticals company, from 2007 to 2015. Mr. Vavricka received his B.S. from Northwestern University.

Wayne Foster has served as our Senior Vice President, Finance and Administration since December 2019. Prior to joining us, Mr. Foster served as Vice President of Finance at Mersana Therapeutics, Inc., a biopharmaceutical company, from January 2012 to September 2019. Mr. Foster received his B.B.A. from the University of Massachusetts Amherst.

Directors

Franklin Berger has served as a member of our Board since September 2019. Mr. Berger is a consultant to biotechnology industry participants, including major biopharmaceutical firms, mid-capitalization biotechnology companies, specialist asset managers and venture capital companies, providing business development, strategic, financing, partnering, and royalty acquisition advice. Mr. Berger is also a biotechnology industry analyst with experience in capital markets and financial analysis and a Founder and Managing Director at FMB Research. Mr. Berger has also served on the board of directors of BELLUS Health, Inc. since May 2010, ESSA Pharma Inc. since March 2015, Proteostasis Therapeutics, Inc. since February 2016, Kezar Life Sciences, Inc. since January 2016, and Five Prime Therapeutics, Inc. since October 2014. Mr. Berger previously served on the

board of directors of Tocagen, Inc. from October 2014 to June 2020. Mr. Berger received his B.A. and M.A. from Johns Hopkins University and his M.B.A. from Harvard Business School. We believe that Mr. Berger's financial background and experience as an equity analyst in the biotechnology industry combined with his experience serving on the boards of directors of multiple public companies qualifies him to serve on our Board.

Grigory Borisenko, Ph.D., has served as a member of our Board since March 2019. Dr. Borisenko is the Investment Director of RUSNANO Management Company LLC, a venture capital and private equity management company in Russia, and has specialized in investment projects in the life sciences since 2012. Dr. Borisenko has also served on the board of directors of Xenetic Biosciences, Inc. since September 2019. Dr. Borisenko received his M.S. and Ph.D. from the Russian State Medical University. We believe Dr. Borisenko is qualified to serve on our Board due to his extensive financial and investment management experience. Dr. Borisenko will resign from our board of directors effective upon the effectiveness of the registration statement related to this offering.

Bihua Chen has served as a member of our Board since June 2018. Ms. Chen is the Founder of Cormorant Asset Management, LLC, or Cormorant, and has been its Chief Executive Officer and Portfolio Manager since Cormorant's inception in 2013. Ms. Chen received her M.B.A. from The Wharton School, University of Pennsylvania, her M.Sc. from the Graduate School of Biomedical Science at Cornell Medical College and her B.S. from Fudan University, Shanghai, China. We believe that Ms. Chen's financial and investment management expertise qualifies her to serve on our Board. Ms. Chen will resign from our board of directors effective upon the effectiveness of the registration statement relating to this offering.

Isaac Cheng, M.D., has served as a member of our Board since March 2019. Dr. Cheng is an investment professional at the Morningside Technology Advisory, LLC, a division of the Morningside Group, a group that invests in venture capital and private equity opportunities. Dr. Cheng served on the board of directors of NuCana PLC from May 2017 to March 2020 and Liquidia Technologies, Inc., from January 2010 to January 2018. Dr. Cheng received his M.D. and B.S. from the Tufts University School of Medicine. We believe Dr. Cheng is qualified to serve on our Board due to his financial expertise, experience as a venture capitalist, industry experience and his experience in serving on the board of directors of public and private life sciences companies.

A*ndrew Hack, M.D., Ph.D.*, has served on our Board since May 2020. Dr. Hack is a Partner and Managing Director of Bain Capital Life Sciences, a private equity fund that invests in biopharmaceutical, specialty pharmaceutical, medical device, diagnostics, and enabling life science technology companies globally. From July 2015 to March 2019, Dr. Hack served as Chief Financial Officer of Editas Medicine, Inc. From May 2011 to June 2015, Dr. Hack was a portfolio manager at Millennium Management LLC, an institutional asset manager, where he ran a healthcare fund focused on biotechnology, pharmaceutical, and medical device companies. From December 2008 to May 2011, Dr. Hack was a healthcare analyst at HealthCor Management, L.P., a registered investment advisor. Previously, Dr. Hack was Director of Life Sciences and co-founder of Reify Corporation, a life science tools and drug discovery company. Dr. Hack also serves as a director of Affinivax, Inc., Allena Pharmaceuticals, Inc., BCLS Acquisition Corp., Dynavax Technologies, Inc., Imperative Care, Inc., JenaValve Technology, Inc. and Mersana Therapeutics, Inc. Dr. Hack received his B.A. in biology with special honors from the University of Chicago, where he also received his M.D. and Ph.D. We believe Dr. Hack is qualified to serve on our Board due to his extensive financial and investment experience in the life sciences industry.

Bruno Lucidi has served as a member of our Board since September 2014. Mr. Lucidi is a Life Sciences Expert at Wallonia Trade and Foreign Investment Agency. From October 2017 to September 2019, Mr. Lucidi was Chief Executive Officer at AgenTus Therapeutics, a pre-clinical stage biopharmaceutical company. Mr. Lucidi was trained in Oncology at the Gustave Roussy Institute, Villejuif, France, in Marketing and Strategic Management of Companies at the Ecole Superieure de Commerce, Paris, France, and in Finance, Merger and Acquisitions at the Investment Banking Institute in New York. We believe Mr. Lucidi is qualified to serve on our Board due to his extensive experience in the life sciences industry.

Polly A. Murphy, D.V.M., Ph.D. has served as a member of our Board since August 2020. Dr. Murphy has served as Chief Business Officer at UroGen Pharma, Inc. since August 2020. Since September 2008, Dr. Murphy has served at Pfizer, Inc., most recently as Vice President and Head of Commercial Development Pfizer Oncology Business Unit from January 2019 to August 2020, Vice President and Head of Global Marketing and Commercial Development Pfizer Oncology Business Unit from June 2017 to December 2018 and as Vice President and Head of Strategy and Business Development for Pfizer China from November 2013 to May 2018. Dr. Murphy received her D.V.M. and Ph.D. from Iowa State University. We believe Dr. Murphy is qualified to serve on our Board due to her experience in the pharmaceutical industry in business development and commercialization.

Bruce Polsky, M.D., has served as a member of our Board since November 2014. Dr. Polsky is the chair of the Department of Medicine at NYU Winthrop Hospital in Mineola, New York, where he has practiced since 2015. He also serves as professor and Chair of the Department of Medicine at NYU Long Island School of Medicine and as an Associate Dean at NYU Long Island School of Medicine. Dr. Polsky is a leading clinical virologist who played an active role in clinical investigations of HIV/AIDS, HBV, HCV and other viral infections. From 1998 to 2015, Dr. Polsky was at Mount Sinai St. Luke's and Mount Sinai Roosevelt Hospitals, where he served as Chair of the Department of Medicine and as Chief of the Division of Infectious Diseases, among other positions. Dr. Polsky received his M.D. from Wayne State University. We believe Dr. Polsky is qualified to serve on our Board due to his extensive clinical experience in the life sciences industry.

Board Composition and Election of Directors

Director Independence

Our board of directors currently consists of eight members. Our board will consist of eight members following the resignation of Dr. Borisenko and Ms. Chen, which will be effective upon the effectiveness of the registration statement relating to this offering. Our board of directors has determined that, of these eight directors, , , and do not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director and that each of these directors is "independent" as that term is defined under the rules of The Nasdaq Stock Market LLC, or the Nasdaq Rules. The Nasdaq Rules' independence definition includes a series of objective tests, such as that the director is not, and has not been for at least three years, one of our employees and that neither the director nor any of his or her family members has engaged in various types of business dealings with us. In addition, as required by the Nasdaq Rules, our board of directors has made a subjective determination as to each independent director that no relationships exists that, in the opinion of our board of directors, would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. In making these determinations, our board of directors reviewed information provided by the directors and us with regard to each director's business and personal activities and relationships as they may relate to us and our management. There are no family relationships among any of our directors or executive officers.

Classified Board of Directors

In accordance with our restated certificate of incorporation that will go into effect upon the closing of this offering, our board of directors will be divided into three classes with staggered, three-year terms. At each annual meeting of stockholders, the successors to directors whose terms then expire will be elected to serve from the time of election and qualification until the third annual meeting following election. Effective upon the closing of this offering, our directors will be divided among the three classes as follows:

- the Class I directors will be and , and their terms will expire at our first annual meeting of stockholders following this offering;

- the Class II directors will be , and , and their terms will expire at our second annual meeting of stockholders following this offering; and
- the Class III directors will be , and , and their terms will expire at the third annual meeting of stockholders following this offering.

Our restated certificate of incorporation that will go into effect upon the closing of this offering will provide that the authorized number of directors may be changed only by resolution of the board of directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one-third of the directors. The division of our board of directors into three classes with staggered three-year terms may delay or prevent a change of our management or a change in control of our company. Our directors may be removed only for cause by the affirmative vote of the holders of at least two-thirds of our outstanding voting stock entitled to vote in the election of directors.

Board Leadership Structure

Our board of directors is currently chaired by Dr. Jean-Pierre Sommadossi. Our corporate governance guidelines provide that, if the chairman of the board is a member of management or does not otherwise qualify as independent, the independent directors of the board may elect a lead director. currently serves as our lead director. The lead director's responsibilities include, but are not limited to: presiding over all meetings of the board of directors at which the chairman is not present, including any executive sessions of the independent directors; approving board meeting schedules and agendas; and acting as the liaison between the independent directors and the chief executive officer and chairman of the board. Our corporate governance guidelines further provide the flexibility for our board of directors to modify our leadership structure in the future as it deems appropriate.

Role of the Board in Risk Oversight

One of the key functions of our board of directors is informed oversight of our risk management process. Our board of directors does not have a standing risk management committee, but rather administers this oversight function directly through our board of directors as a whole, as well as through various standing committees of our board of directors that address risks inherent in their respective areas of oversight. In particular, our board of directors is responsible for monitoring and assessing strategic risk exposure and our audit committee has the responsibility to consider and discuss our major financial risk exposures and the steps our management has taken to monitor and control these exposures, including guidelines and policies to govern the process by which risk assessment and management is undertaken. Our audit committee also monitors compliance with legal and regulatory requirements. Our nominating and corporate governance committee monitors the effectiveness of our corporate governance practices, including whether they are successful in preventing illegal or improper liability-creating conduct. Our compensation committee assesses and monitors whether any of our compensation policies and programs has the potential to encourage excessive risk-taking. While each committee is responsible for evaluating certain risks and overseeing the management of such risks, our entire board of directors is regularly informed through committee reports about such risks.

Board Committees

Our board of directors has established three standing committees—audit, compensation and nominating and corporate governance—each of which operates under a charter that has been approved by our board of directors. Upon our listing on The Nasdaq Global Market, each committee's charter will be available under the Corporate Governance section of our website at *www.Ateapharma.com*. The reference to our website address

does not constitute incorporation by reference of the information contained at or available through our website, and you should not consider it to be a part of this prospectus.

Audit Committee

The audit committee's responsibilities include:

- appointing, approving the compensation of, and assessing the independence of our registered public accounting firm;
- overseeing the work of our registered public accounting firm, including through the receipt and consideration of reports from such firm;
- reviewing and discussing with management and the registered public accounting firm our annual and quarterly financial statements and related disclosures;
- coordinating our board of directors' oversight of our internal control over financial reporting, disclosure controls and procedures and code of business conduct and ethics;
- discussing our risk management policies;
- meeting independently with our internal auditing staff, if any, registered public accounting firm and management;
- reviewing and approving or ratifying any related person transactions; and
- preparing the audit committee report required by Securities Exchange Commission, or SEC, rules.

The members of our audit committee are and . serves as the chairperson of the committee. All members of our audit committee meet the requirements for financial literacy under the Nasdaq Rules. Our board of directors has determined that and meet the independence requirements of Rule 10A-3 under the Exchange Act and the applicable Nasdaq Rules. Our board of directors has determined that is an "audit committee financial expert" as defined by applicable SEC rules and has the requisite financial sophistication as defined under the applicable Nasdaq Rules.

Compensation Committee

The compensation committee's responsibilities include:

- reviewing and approving, or recommending for approval by the board of directors, the compensation of our CEO and our other executive officers;
- overseeing and administering our cash and equity incentive plans;
- reviewing and making recommendations to our board of directors with respect to director compensation;
- reviewing and discussing annually with management our "Compensation Discussion and Analysis," to the extent required; and
- preparing the annual compensation committee report required by SEC rules, to the extent required.

The members of our compensation committee are . serves as the chairperson of the committee. Our board of directors has determined that each of is independent under the applicable Nasdaq Rules, including the Nasdaq Rules specific to membership on the compensation committee, and is a "non-employee director" as defined in Rule 16b-3 promulgated under the Exchange Act.

Nominating and Corporate Governance Committee

The nominating and corporate governance committee's responsibilities include:

- identifying individuals qualified to become board members;
- recommending to our board of directors the persons to be nominated for election as directors and to each board committee;
- developing and recommending to our board of directors corporate governance guidelines, and reviewing and recommending to our board of directors proposed changes to our corporate governance guidelines from time to time; and
- overseeing a periodic evaluation of our board of directors.

The members of our nominating and corporate governance committee are and . serves as the chairperson of the committee. Our board of directors has determined that are independent under the applicable Nasdaq Rules and the SEC rules and regulations.

Compensation Committee Interlocks and Insider Participation

No member of our compensation committee is or has been our current or former officer or employee. None of our executive officers served as a director or a member of a compensation committee (or other committee serving an equivalent function) of any other entity, one of whose executive officers served as a director or member of our compensation committee.

Code of Ethics and Code of Conduct

We have adopted a written code of business conduct and ethics that applies to our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. Upon our listing on The Nasdaq Global Market, our code of business conduct and ethics will be available under the Corporate Governance section of our website at *www.Ateapharma.com*. In addition, we intend to post on our website all disclosures that are required by law or the Nasdaq rules concerning any amendments to, or waivers from, any provision of the code. The reference to our website address does not constitute incorporation by reference of the information contained at or available through our website, and you should not consider it to be a part of this prospectus.

EXECUTIVE AND DIRECTOR COMPENSATION

This section discusses the material components of the executive compensation program for our executive officers who are named in the 2019 Summary Compensation Table below. In 2019, our "named executive officers" and their positions were:

- Jean-Pierre Sommadossi, Ph.D., Chairman and Chief Executive Officer;
- Andrea Corcoran, Chief Financial Officer and Executive Vice President, Legal; and
- Daniel Geffken, former Interim Chief Financial Officer.

Mr. Geffken resigned his position as our Interim Chief Financial Officer in October 2020, and was succeeded by Ms. Corcoran. This discussion may contain forward-looking statements that are based on our current plans, considerations, expectations and determinations regarding future compensation programs. Actual compensation programs that we adopt following the completion of this offering may differ materially from the currently planned programs summarized in this discussion.

2019 Summary Compensation Table

The following table sets forth information concerning the compensation of our named executive officers for the year ended December 31, 2019.

Name and Principal Position	Year	Salary ($)	Bonus ($)(1)	Option Awards ($)(2)	Non-Equity Incentive Plan Compensation ($)	All Other Compensation ($)(3)	Total ($)
Jean-Pierre Sommadossi Founder, Chairman and Chief Executive Officer	2019	400,000	160,000	251,080	—	—	811,080
Andrea Corcoran Chief Financial Officer and Executive Vice President, Legal	2019	290,000	75,000	75,324	—	—	440,324
Daniel Geffken Former Interim Chief Financial Officer	2019	—		101,426	—	145,000	246,426

(1) Amounts represent the discretionary annual bonus paid in recognition of 2019 performance. Refer to "—2019 Bonuses" below for additional information.

(2) Amounts represent the aggregate grant date fair value of stock options issued during 2019, computed in accordance with ASC Topic 718, rather than the amounts paid to or realized by the named individual. We provide information regarding the assumptions used to calculate the value of these options in Note 2 to the consolidated financial statements included in this prospectus.

(3) For Mr. Geffken, amount represents fees paid to Danforth for Mr. Geffken's services pursuant to a consulting agreement between the Company and Danforth. Mr. Geffken is a founder of Danforth. Mr. Geffken resigned his position as our Interim Chief Financial Officer in October 2020, and was succeeded by Ms. Corcoran. Refer to "—Executive Compensation Arrangements" below for additional information regarding the consulting agreement.

NARRATIVE TO SUMMARY COMPENSATION TABLE

2019 Salaries

Each of Dr. Sommadossi and Ms. Corcoran receives a base salary to provide a fixed component of compensation reflecting the executive's skill set, experience, role and responsibilities. Mr. Geffken was not an employee of the Company and therefore did not receive a base salary from the Company. Annual base salaries are reviewed

periodically by the board of directors. Effective January 1, 2019, following its annual review, the board of directors increased the base salaries for the named executive officers as follows:

- Dr. Sommadossi's base salary was increased from $350,000 to $400,000 per year; and
- Ms. Corcoran's base salary was increased from $242,000 to $290,000 per year.

Effective January 1, 2020, following its annual review, the board of directors increased the base salaries for the named executive officers as follows:

- Dr. Sommadossi's base salary was increased from $400,000 to $412,000 per year; and
- Ms. Corcoran's base salary was increased from $290,000 to $298,700 per year.

2019 Bonuses

Our board of directors may elect to provide annual bonuses to each of Dr. Sommadossi and Ms. Corcoran based on the executive's or our annual performance. In December 2019, our board of directors evaluated the performance of Dr. Sommadossi and Ms. Corcoran for fiscal year 2019 and, in recognition of the Company's and each executive's performance, elected to pay each of them the respective discretionary cash bonus set forth above in the 2019 Summary Compensation Table.

Equity Compensation

In 2019, we granted stock options to our employees and certain other service providers, including our named executive officers, as the long-term incentive component of our compensation program. Our stock options generally allow employees to purchase shares of our common stock at a price per share equal to the fair market value of our common stock on the date of grant, as determined by the board of directors.

The following table sets forth the stock options granted to our named executive officers in during 2019.

Named Executive Officer	2019 Stock Options Granted
Jean-Pierre Sommadossi	200,000
Andrea Corcoran	60,000
Daniel Geffken	116,891

These stock options were granted under our 2013 Equity Incentive Plan which we refer to as the Prior Plan, with exercise prices equal to $1.85 for Dr. Sommadossi and Ms. Corcoran and $1.43 for Mr. Geffken, which the board of directors determined to be the fair market value of our common stock on the date of grant. The option granted to each of Dr. Sommadossi and Ms. Corcoran vests in 48 equal monthly installments on the final day of each month following the date of grant, with the first installment vesting on December 31, 2019, subject to continued employment through each applicable vesting date. The option granted to Mr. Geffken vests in 24 monthly installments over the two years following the date of grant, subject to the consulting agreement between Danforth and the Company remaining in effect. Refer to "—Executive Compensation Arrangements" below for additional information regarding the consulting agreement.

In connection with this offering, we intend to adopt a 2020 Omnibus Incentive Plan, referred to below as the 2020 Plan, in order to facilitate the grant of cash and equity incentives to directors, employees (including our named executive officers) and consultants of the Company and certain of its affiliates and to enable the Company and certain of its affiliates to obtain and retain services of these individuals, which we consider to be essential to our long-term success. Following the effective date of the 2020 Plan, we will not make any further grants under the Prior Plan. However, the Prior Plan will continue to govern the terms and conditions of the outstanding awards previously granted under it. For additional information about the 2020 Plan, please see the section titled "Incentive Compensation Plans" below.

Other Elements of Compensation

During their employment, our named executive officers are eligible to participate in our employee benefit plans and programs, including medical and dental benefits, to the same extent and on the same terms as our other full-time employees generally. As a non-employee service provider of the Company, Mr. Geffken did not participate in our employee benefit plans and programs.

Outstanding Equity Awards at 2019 Fiscal Year-End

The following table summarizes the outstanding equity incentive plan awards for each named executive officer as of December 31, 2019.

		Option Awards			
Name	Grant Date	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price ($)	Option Expiration Date
Jean-Pierre Sommadossi	12/13/2019(1)	4,167	195,833	1.85	12/12/2029
	12/14/2018(1)	54,167	145,833	1.43	12/14/2028
	12/8/2017(2)	323,889	61,111	1.53	12/8/2027
	12/9/2016(3)	300,000		1.24	12/9/2026
Andrea Corcoran	12/13/2019(1)	1,250	58,750	1.85	12/12/2029
	12/4/2018(1)	16,250	43,750	1.43	12/14/2028
	12/8/2017(4)	41,667	18,333	1.53	12/8/2027
	12/9/2016(4)	60,000		1.24	12/9/2026
Daniel Geffken	7/31/2019(5)	24,352	92,539	1.43	7/30/2029

(1) The option vests in 48 equal monthly installments beginning December 31 of the year of grant, subject to continued employment through each applicable vesting date.

(2) The option was vested as to 185,000 shares on the date of grant and the remaining portion of the option vests in 36 equal monthly installments beginning December 31 of the year of grant, subject to continued employment through each applicable vesting date.

(3) The option was vested as to 75,000 shares on the date of grant and the remaining portion of the option vests in 36 equal monthly installments beginning December 31 of the year of grant, subject to continued employment through each applicable vesting date.

(4) The option vests in 36 equal monthly installments beginning December 31 of the year of grant, subject to continued employment through each applicable vesting date.

(5) The option vests in 24 equal monthly installments beginning at the end of each one-month period following the date of grant, subject to the consulting agreement between Danforth and the Company remaining in effect through each such vesting date. If the Company terminates the consulting agreement without cause prior to the first anniversary of the date of grant, the vesting of any unvested portion of the option will immediately accelerate, vest and become exercisable.

Executive Compensation Arrangements

During 2019, neither Dr. Sommadossi nor Ms. Corcoran was a party to an agreement providing for any severance, termination or change in control benefits or payments.

During 2019, we were party to a consulting agreement with Danforth, or the Danforth Agreement, pursuant to which we paid Danforth for services rendered by certain of its consultants, including Mr. Geffken. The Danforth Agreement is terminable by either party other than for cause upon 60 days' prior written notice to the other party. On October 1, 2020, we notified Danforth that the Danforth Agreement would terminate upon expiration of the 60 day notice period, and Mr. Geffken resigned his position as our Interim Chief Financial Officer with immediate effect.

Compensation Changes in Connection with Initial Public Offering

In connection with this offering, we may enter into new or additional compensation arrangements with our named executive officers. The terms of any such arrangements are not yet known.

Director Compensation

Historically, our non-employee directors have not received cash compensation for their services and have instead, from time to time, been compensated with stock option awards in amounts determined by our board of directors. In September 2019, at the time of his election to the board of directors, we granted Mr. Berger an option to purchase 50,000 shares of our common stock for an exercise price of $1.43 per share, which our board of directors determined to be the per share fair market value of our common stock on the date of grant. The option vests on the last day of each calendar month following September 20, 2019, subject to Mr. Berger's continued service on the applicable vesting date. None of our other non-employee directors received any compensation for serving on our board during 2019.

Dr. Sommadossi is a member of our board of directors but does not receive additional compensation for this service. Refer to "Executive Compensation" above for additional information regarding the compensation earned by Dr. Sommadossi in 2019.

2019 Director Compensation Table

Name	Fees Earned or Paid in Cash ($)	Stock Awards ($)(1)	Option Awards ($)(1)	Non-Equity Incentive Plan Compensation ($)	Nonqualified Deferred Compensation Earnings ($)	All Other Compensation ($)	Total ($)
Franklin Berger	—	—	33,015	—	—	—	33,015
Grigory Borisenko, Ph.D.	—	—	—	—	—	—	—
Bihua Chen	—	—	—	—	—	—	—
Isaac Cheng, M.D.	—	—	—	—	—	—	—
Bruno Lucidi	—	—	—	—	—	—	—
Polly A. Murphy, D.V.M.; Ph.D.	—	—	—	—	—	—	—
Bruce Polsky, M.D.	—	—	—	—	—	—	—
Frank Yu(2)	—	—	—	—	—	—	—
Evgeny Zaytsev(3)	—	—	—	—	—	—	—

(1) Amount reflects the full grant-date fair value of stock options granted during 2019 computed in accordance with ASC Topic 718, rather than the amounts paid to or realized by Mr. Berger. We provide information regarding the assumptions used to calculate the value of the option awards in Note 2 to the consolidated financial statements included in this prospectus.

(2) Mr. Yu resigned from our board of directors on December 11, 2019.

(3) Mr. Zaytsev resigned from our board of directors on January 31, 2019.

The table below shows the aggregate numbers of option awards (exercisable and unexercisable) held as of December 31, 2019 by each non-employee director who was serving as of December 31, 2019. None of these individuals held unvested stock awards as of December 31, 2019.

Name	Options Outstanding at Fiscal Year End
Franklin Berger	50,000
Bruno Lucidi	125,000
Bruce Polsky, M.D.	125,000
Grigory Borisenko, Ph.D.	—
Bihua Chen	—
Isaac Cheng, M.D.	—
Polly A. Murphy, D.V.M.; Ph.D.	—

We intend to approve and implement a compensation program for our non-employee directors that consists of annual retainer fees and long-term equity awards and will become effective on the effectiveness of the registration statement for which this prospectus forms a part. The terms of this program have not yet been determined.

Incentive Compensation Plans

The following summarizes the material terms of the 2020 Plan and the 2020 Employee Stock Purchase Plan, which will be the long-term incentive compensation plans in which our directors and named executive officers are eligible to participate following the consummation of this offering, and the Prior Plan, under which we have previously made periodic grants of equity and equity-based awards to our directors and named executive officers.

2020 Omnibus Incentive Plan

Effective the day prior to the first public trading date of our common stock, we intend to adopt and ask our stockholders to approve the 2020 Plan, under which we may grant cash and equity-based incentive awards to eligible service providers in order to attract, retain and motivate the persons who make important contributions to the Company. The material terms of the 2020 Plan are summarized below.

Eligibility and Administration

Our employees, consultants and directors, and employees, directors and consultants of our subsidiaries, will be eligible to receive awards under the 2020 Plan. The 2020 Plan will be administered by our board of directors, which may delegate its duties and responsibilities to one or more committees of our directors and/or officers (referred to collectively as the plan administrator below), subject to the limitations imposed under the 2020 Plan, Section 16 of the Exchange Act, stock exchange rules and other applicable laws. The plan administrator will have the authority to take all actions and make all determinations under the 2020 Plan, to interpret the 2020 Plan and award agreements and to adopt, amend and repeal rules for the administration of the 2020 Plan as it deems advisable. The plan administrator will also have the authority to grant awards, determine which eligible service providers receive awards and set the terms and conditions of all awards under the 2020 Plan, including any vesting and vesting acceleration provisions, subject to the conditions and limitations in the 2020 Plan. As of , 2020, approximately employees, six non-employee directors and consultants would have been eligible to participate in the 2020 Plan if it had been in effect.

Shares Available for Awards

An aggregate of shares of our common stock will initially be available for issuance under the 2020 Plan. The number of shares initially available for issuance will be increased on January 1 of each calendar year beginning in 2020 and ending in and including 2029, equal to the lesser of (A) % of the shares of common stock outstanding on the final day of the immediately preceding calendar year and (B) a smaller number of shares determined by our board of directors. No more than shares of common stock may be issued under the 2020 Plan upon the exercise of incentive stock options, or ISOs. Shares issued under the 2020 Plan may be authorized but unissued shares, shares purchased on the open market or treasury shares.

If an award under the 2020 Plan or the Prior Plan expires, lapses or is terminated, exchanged for cash, surrendered, repurchased, canceled without having been fully exercised or forfeited, any unused shares subject to the award will, as applicable, become or again be available for new grants under the 2020 Plan. Awards granted under the 2020 Plan in substitution for any options or other stock or stock-based awards granted by an entity before the entity's merger or consolidation with us or our acquisition of the entity's property or stock will not reduce the shares available for grant under the 2020 Plan, but may count against the maximum number of shares that may be issued upon the exercise of ISOs.

Awards

The 2020 Plan provides for the grant of stock options, including ISOs, and nonqualified stock options, or NSOs, stock appreciation rights, or SARs, restricted stock, dividend equivalents, restricted stock units, or RSUs, and other stock or cash based awards. Certain awards under the 2020 Plan may constitute or provide for payment of "nonqualified deferred compensation" under Section 409A of the Code. All awards under the 2020 Plan will be set forth in award agreements, which will detail the terms and conditions of awards, including any applicable vesting and payment terms and post-termination exercise limitations. A brief description of each award type follows.

- Stock Options and SARs. Stock options provide for the purchase of shares of our common stock in the future at an exercise price set on the grant date. ISOs, by contrast to NSOs, may provide tax deferral beyond exercise and favorable capital gains tax treatment to their holders if certain holding period and other requirements of the Code are satisfied. SARs entitle their holder, upon exercise, to receive from us an amount equal to the appreciation of the shares subject to the award between the grant date and the exercise date. The plan administrator will determine the number of shares covered by each option and SAR, the exercise price of each option and SAR and the conditions and limitations applicable to the exercise of each option and SAR. The exercise price of a stock option or SAR will not be less than 100% of the fair market value of the underlying share on the grant date (or 110% in the case of ISOs granted to certain significant stockholders), except with respect to certain substitute awards granted in connection with a corporate transaction. The term of a stock option or SAR may not be longer than ten years (or five years in the case of ISOs granted to certain significant stockholders).
- Restricted Stock and RSUs. Restricted stock is an award of nontransferable shares of our common stock that remain forfeitable unless and until specified conditions are met and which may be subject to a purchase price. RSUs are contractual promises to deliver shares of our common stock in the future, which may also remain forfeitable unless and until specified conditions are met, RSUs may be accompanied by the right to receive the equivalent value of dividends paid on shares of our common stock prior to the delivery of the underlying shares. The plan administrator may provide that the delivery of the shares underlying RSUs will be deferred on a mandatory basis or at the election of the participant. The terms and conditions applicable to restricted stock and RSUs will be determined by the plan administrator, subject to the conditions and limitations contained in the 2020 Plan.

- Other Stock or Cash Based Awards. Other stock or cash based awards are awards of cash, fully vested shares of our common stock and other awards valued wholly or partially by referring to, or otherwise based on, shares of our common stock or other property. Other stock or cash based awards may be granted to participants and may also be available as a payment form in the settlement of other awards, as standalone payments and as payment in lieu of compensation to which a participant is otherwise entitled. The plan administrator will determine the terms and conditions of other stock or cash based awards, which may include any purchase price, performance goal, transfer restrictions and vesting conditions.

Performance Criteria

The plan administrator may select performance criteria for an award to establish performance goals for a performance period. Performance criteria under the 2020 Plan may include, but are not limited to, the following: net earnings or losses (either before or after one or more of interest, taxes, depreciation, amortization, and non-cash equity-based compensation expense); gross or net sales or revenue, or sales or revenue growth; net income (either before or after taxes) or adjusted net income; profits (including but not limited to gross profits, net profits, profit growth, net operation profit or economic profit), profit return ratios or operating margin; budget or operating earnings (either before or after taxes or before or after allocation of corporate overhead and bonuses); cash flow (including operating cash flow and free cash flow or cash flow return on capital); return on assets; return on capital or invested capital; cost of capital; return on stockholders' equity; total stockholder return; return on sales; costs, reductions in costs and cost control measures; expenses; working capital; earnings or loss per share; adjusted earnings or loss per share; price per share or dividends per share (or appreciation in or maintenance of such price or dividends); regulatory achievements or compliance; implementation, completion or attainment of objectives relating to research, development, regulatory, commercial, or strategic milestones or developments; market share; economic value or economic value added models; division, group or corporate financial goals; customer satisfaction/growth; customer service; employee satisfaction; recruitment and maintenance of personnel; human resources management; supervision of litigation and other legal matters; strategic partnerships and transactions; financial ratios (including but not limited to those measuring liquidity, activity, profitability or leverage); debt levels or reductions; sales-related goals; financing and other capital raising transactions; cash on hand; acquisition activity; investment sourcing activity; and marketing initiatives, any of which may be measured in absolute terms or as compared to any incremental increase or decrease. Such performance goals may be based solely upon the Company's performance or the performance of a subsidiary, division, business segment or business unit of the Company or a subsidiary, or based upon performance relative to performance of other companies or upon comparisons of any of the indicators of performance relative to performance of other companies. When determining performance goals, the plan administrator may provide for exclusion of the impact of an event or occurrence which the plan administrator determines should appropriately be excluded, including, without limitation, non-recurring charges or events, acquisitions or divestitures, changes in the corporate or capital structure, events unrelated to the business or outside of the control of management, foreign exchange considerations, and legal, regulatory, tax or accounting changes.

Certain Transactions

In connection with certain corporate transactions and events affecting our common stock, including a change in control, or change in any applicable laws or accounting principles, the plan administrator has broad discretion to take action under the 2020 Plan to prevent the dilution or enlargement of intended benefits, facilitate the transaction or event or give effect to the change in applicable laws or accounting principles. This includes canceling awards for cash or property, accelerating the vesting of awards, providing for the assumption or substitution of awards by a successor entity, adjusting the number and type of shares subject to outstanding

awards and/or with respect to which awards may be granted under the 2020 Plan and replacing or terminating awards under the 2020 Plan. In addition, in the event of certain non-reciprocal transactions with our stockholders, the plan administrator will make equitable adjustments to awards outstanding under the 2020 Plan as it deems appropriate to reflect the transaction.

Provisions of the 2020 Plan Relating to Director Compensation.

The 2020 Plan provides that the plan administrator may establish compensation for non-employee directors from time to time subject to the 2020 Plan's limitations. Prior to commencing this offering, we intend to approve and implement a compensation program for our non-employee directors, which is described above under the heading "Director Compensation." Our board of directors or its authorized committee may modify the non-employee director compensation program from time to time in the exercise of its business judgment, taking into account such factors, circumstances and considerations as it shall deem relevant from time to time, provided that the sum of any cash compensation or other compensation and the grant date fair value of any equity awards granted under the 2020 Plan as compensation for services as a non-employee director during any fiscal year may not exceed $ in the fiscal year of the non-employee director's initial service and $ in any other fiscal year. The plan administrator may make exceptions to this limit for individual non-employee directors in extraordinary circumstances, as the plan administrator may determine in its discretion, subject to the limitations in the 2020 Plan.

Plan Amendment and Termination

Our board of directors may amend or terminate the 2020 Plan at any time; however, no amendment, other than an amendment that increases the number of shares available under the 2020 Plan, may materially and adversely affect an award outstanding under the 2020 Plan without the consent of the affected participant, and stockholder approval will be obtained for any amendment to the extent necessary to comply with applicable laws. Further, the plan administrator may, without the approval of our stockholders, amend any outstanding stock option or SAR to reduce its price per share, other than in the context of corporate transactions or equity restructurings, as described above. The 2020 Plan will remain in effect until the tenth anniversary of its effective date, unless earlier terminated by our board of directors. No awards may be granted under the 2020 Plan after its termination.

Foreign Participants, Claw-back Provisions, Transferability and Participant Payments

The plan administrator may modify awards granted to participants who are foreign nationals or employed outside the United States or establish subplans or procedures to address differences in laws, rules, regulations or customs of such foreign jurisdictions. All awards will be subject to any Company claw-back policy as set forth in such claw-back policy or the applicable award agreement. Except as the plan administrator may determine or provide in an award agreement, awards under the 2020 Plan are generally non-transferrable, except by will or the laws of descent and distribution, or, subject to the plan administrator's consent, pursuant to a domestic relations order, and are generally exercisable only by the participant. With regard to tax withholding obligations arising in connection with awards under the 2020 Plan and exercise price obligations arising in connection with the exercise of stock options under the 2020 Plan, the plan administrator may, in its discretion, accept cash, wire transfer or check, shares of our common stock that meet specified conditions, a promissory note, a "market sell order," other consideration as the plan administrator deems suitable or any combination of the foregoing.

2020 Employee Stock Purchase Plan

Effective the day prior to the first public trading date of our common stock, we intend to adopt and ask our stockholders to approve the 2020 Employee Stock Purchase Plan, or the 2020 ESPP, the material terms of which are summarized below.

Shares Available for Awards; Administration

A total of shares of our common stock will initially be reserved for issuance under the 2020 ESPP. In addition, the number of shares available for issuance under the 2020 ESPP will be annually increased on January 1 of each calendar year beginning in 2020 and ending in and including 2030, by an amount equal to the lesser of (A) % of the shares outstanding on the final day of the immediately preceding calendar year and (B) such smaller number of shares as is determined by our board of directors, provided that no more than shares of our common stock may be issued under the 2020 ESPP. Our board of directors or a committee of our board of directors will administer and will have authority to interpret the terms of the 2020 ESPP and determine eligibility of participants. We expect that the compensation committee of our board of directors will be the initial administrator of the 2020 ESPP.

Eligibility

All of our employees are eligible to participate in the 2020 ESPP. However, an employee may not be granted rights to purchase stock under our 2020 ESPP if the employee, immediately after the grant, would own (directly or through attribution) stock possessing 5% or more of the total combined voting power or value of all classes of our stock.

Grant of Rights

The 2020 ESPP is intended to qualify under Section 423 of the Code and stock will be offered under the 2020 ESPP during offering periods. The length of the offering periods under the 2020 ESPP will be determined by the plan administrator and may be up to twenty-seven months long. Employee payroll deductions will be used to purchase shares on each purchase date during an offering period. The purchase dates for each offering period will be the final trading day in the offering period. Offering periods under the 2020 ESPP will commence when determined by the plan administrator. The plan administrator may, in its discretion, modify the terms of future offering periods.

The 2020 ESPP permits participants to purchase common stock through payroll deductions of up to a specified percentage of their eligible compensation. The plan administrator will establish a maximum number of shares that may be purchased by a participant during any offering period. In addition, no employee will be permitted to accrue the right to purchase stock under the 2020 ESPP at a rate in excess of $25,000 worth of shares during any calendar year during which a purchase right under the 2020 ESPP is outstanding (based on the fair market value per share of our common stock as of the first day of the offering period).

On the first trading day of each offering period, each participant will automatically be granted an option to purchase shares of our common stock. The option will expire at the end of the applicable offering period, and will be exercised at that time to the extent of the payroll deductions accumulated during the offering period. The purchase price of the shares, in the absence of a contrary designation, will be 85% of the lower of the fair market value of our common stock on the first trading day of the offering period or on the purchase date. Participants may voluntarily end their participation in the 2020 ESPP at any time during a specified period prior to the end of the applicable offering period, and will be paid their accrued payroll deductions that have not yet been used to purchase shares of common stock. Participation ends automatically upon a participant’s termination of employment.

A participant may not transfer rights granted under the 2020 ESPP, other than by will or the laws of descent and distribution. A participant's rights under the 2020 ESPP are generally exercisable only by the participant.

Certain Transactions

In the event of certain non-reciprocal transactions or events affecting our common stock, the plan administrator will make equitable adjustments to the 2020 ESPP and outstanding rights. In the event of certain unusual or non-recurring events or transactions, including a change in control, the plan administrator may provide for (1) either the replacement of outstanding rights with other rights or property or the termination of outstanding rights in exchange for cash, (2) the assumption or substitution of outstanding rights by the successor or survivor corporation or the parent or subsidiary thereof, if any, (3) the adjustment in the number and type of shares of stock subject to outstanding rights, (4) the use of participants' accumulated payroll deductions to purchase stock on a new purchase date prior to the next scheduled purchase date and the termination of any rights under ongoing offering periods or (5) the termination of all outstanding rights.

Plan Amendment

The plan administrator may amend, suspend or terminate the 2020 ESPP at any time. However, stockholder approval will be obtained for any amendment that increases the aggregate number or changes the type of shares that may be sold pursuant to rights under the 2020 ESPP, changes the corporations or classes of corporations whose employees are eligible to participate in the 2020 ESPP or changes the 2020 ESPP in any manner that would cause the 2020 ESPP to no longer be an employee stock purchase plan within the meaning of Section 423(b) of the Code.

2013 Equity Incentive Plan

Our board of directors and stockholders have approved our Prior Plan, under which we may grant stock options and other stock-based awards to employees, directors and consultants of the Company. We have reserved a total of 10,979,971 shares of our common stock for issuance under the Prior Plan.

Following the effectiveness of the 2020 Plan, we will not make any further grants under the Prior Plan. However, the Prior Plan will continue to govern the terms and conditions of the outstanding awards granted under it. Shares of our common stock subject to awards granted under the Prior Plan that are forfeited, lapse unexercised or are settled in cash and which following the effective date of the 2020 Plan are not issued under the Prior Plan will be available for issuance under the 2020 Plan.

Eligibility and Administration

Our employees, officers, and directors, as well as consultants and advisors to the Company are eligible to receive awards under the Prior Plan. Our board of directors or a committee thereof administers the Prior Plan. Subject to the express terms and conditions of the Prior Plan, the plan administrator has the authority to make all determinations and interpretations under the Prior Plan, prescribe all forms for use with the Prior Plan and adopt, alter and/or rescind rules, guidance and practices for the administration of the Prior Plan. The plan administrator also sets the terms and conditions of all awards under the Prior Plan, including any vesting and vesting acceleration conditions.

Awards

The Prior Plan provides for the grant of stock options (including NSOs and ISOs), restricted stock, RSUs, and other equity-based awards. As of September 30, 2020, options to purchase 7,001,747 shares of our common stock and 200,000 shares of restricted stock were outstanding under the Prior Plan.

Certain Transactions

The plan administrator has broad discretion to adjust the provisions of the Prior Plan and the terms and conditions of awards, including with respect to aggregate number and kind of shares subject to the Prior Plan and awards granted pursuant to the Prior Plan and the purchase or exercise price of awards granted pursuant to the Prior Plan, to prevent substantial dilution or enlargement of the rights of participants under the Prior Plan in the event of certain transactions and events affecting our common stock, such as stock dividends, stock splits, recapitalizations, consolidations and other corporate transactions. The plan administrator may also provide for the acceleration, cash-out, assumption, substitution or conversion of awards in the event of a certain transactions, including a “change in control” (as such term is defined in the Prior Plan).

Amendment and Termination

The plan administrator may terminate, amend or modify the Prior Plan at any time and from time to time. The administrator may also amend, modify or terminate any outstanding award, including but not limited to, substituting therefor another award. No change to the Prior Plan or an award outstanding under the Prior Plan may materially and adversely affect outstanding awards without the holder’s consent. Furthermore, we must generally obtain stockholder approval to the extent required by applicable law, rule or regulation (including any applicable stock exchange rule).

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

The following includes a summary of transactions since January 1, 2017 to which we have been a party in which the amount involved exceeded or will exceed the lesser of (i) $120,000 or (ii) one percent of the average of our total assets at fiscal yearend for our last two fiscal years, and in which any of our directors, executive officers or, to our knowledge, beneficial owners of more than 5% of our capital stock or any member of the immediate family of any of the foregoing persons had or will have a direct or indirect material interest, other than equity and other compensation, termination, change in control and other arrangements, which are described under “Executive and Director Compensation.” We also describe below certain other transactions with our directors, executive officers and stockholders.

Preferred Stock Financings

Series C Preferred Stock Financing. From June 2018 to July 2018, we issued and sold to investors in private placements an aggregate of 6,052,617 shares of our Series C convertible preferred stock at a purchase price of $4.56 per share, for aggregate consideration of approximately $27.6 million.

Series D Preferred Stock Financing. In May 2020, we issued and sold to investors in a private placement an aggregate of 15,313,382 shares of our Series D convertible preferred stock at a purchase price of $7.02 per share, for aggregate consideration of approximately $107.5 million.

Series D-1 Preferred Stock Financing. In October 2020, we issued and sold to investors in a private placement an aggregate of 8,973,261 shares of our Series D-1 convertible preferred stock at a purchase price of $11.98 per share, for aggregate consideration of approximately $107.5 million.

The following table sets forth the aggregate number of shares of our capital stock acquired by beneficial owners of more than 5% of our capital stock in the financing transactions described above. Each share of our Series C preferred stock identified in the following table will convert into one share of common stock immediately prior to the closing of this offering. Each share of our Series D preferred stock identified in the following table will convert into one share of common stock immediately prior to the closing of this offering.

Participants	Series C Preferred Stock	Series D Preferred Stock	Series D-1 Preferred Stock
5% or Greater Stockholders(1)			
Bain Capital Life Sciences Fund II, L.P.	—	3,015,872	1,767,230
BCIP Life Sciences Associates, LP	—	367,318	215,239
Cormorant Private Healthcare Fund I, LP	1,951,053	—	—
Cormorant Private Healthcare Fund II L.P.	—	575,427	337,185
Cormorant Global Healthcare Master Fund, LP	587,632	136,823	80,175
Morningside Venture Investments Limited	800,438	1,068,376	626,043

(1) Additional details regarding these stockholders and their equity holdings are provided in this prospectus under the caption “Principal Stockholders.”

Some of our directors are associated with our principal stockholders as indicated in the table below:

Director	Principal Stockholder
Bihua Chen	Cormorant Private Healthcare Fund I, LP
	Cormorant Private Healthcare Fund II L.P.
	Cormorant Global Healthcare Master Fund, LP
Andrew Hack, M.D. Ph.D.	Bain Capital Life Sciences Fund II, L.P.
	BCIP Life Sciences Associates, LP
Isaac Cheng, M.D.	Morningside Venture Investments Limited

Stockholders Agreement

We entered into a Fourth Amended and Restated Stockholders Agreement on May 19, 2020, by and among us and certain of our stockholders, pursuant to which the following directors were designated to serve as members on our board of directors and, as of the date of this prospectus, so serve: Dr. Sommadossi, Mr. Berger, Mr. Borisenko, Ms. Chen, Dr. Cheng, Dr. Hack, Mr. Lucidi, Dr. Murphy and Dr. Polsky. Dr. Jean-Pierre Sommadossi, Mr. Franklin Berger, Dr. Bruce Polsky and Mr. Bruno Lucidi were selected to serve on our board of directors as a representatives of holders of our common stock. Dr. Cheng was selected to serve on our board of directors as a representative of holders of our Series A preferred stock. Mr. Borisenko was selected to serve on our board of directors as a representative of holders of our preferred stock, as designated by the entities affiliated with RMI Investments S.A.R.L. Ms. Chen was selected to serve on our board of directors as a representative of holders of our preferred stock, as designated by the entities affiliated with Cormorant Private Healthcare Fund I, LP. Dr. Hack was selected to serve on our board of directors as a representative of holders of our preferred stock, as designated by the entities affiliated with Bain Capital Life Sciences Investors, LLC.

The stockholders agreement will terminate upon the consummation of this offering. The composition of our board of directors after this offering is described in more detail under “Management—Board Composition and Election of Directors.”

Indemnification Agreements

We intend to enter into indemnification agreements with each of our directors and executive officers. These agreements, among other things, require us or will require us to indemnify each director (and in certain cases their related venture capital funds) and executive officer to the fullest extent permitted by Delaware law, including indemnification of expenses such as attorneys’ fees, judgments, fines and settlement amounts incurred by the director or executive officer in any action or proceeding, including any action or proceeding by or in right of us, arising out of the person’s services as a director or executive officer. For further information, see “Executive and Director Compensation—Limitations of Liability and Indemnification.”

Stock Option Grants to Executive Officers and Directors

We have granted stock options to our executive officers and certain of our directors as more fully described in the section entitled “Executive and Director Compensation.”

Danforth Consulting Agreement

In August 2019, we engaged Danforth, a consulting firm specializing in providing financial and strategic support to life sciences companies and an affiliate of Daniel Geffken, who served as our interim Chief Financial Officer from August 2019 to October 2020. On October 1, 2020 we notified Danforth that we are terminating this agreement, which will terminate 60 days from the date of notification. Pursuant to this agreement, we paid professional fees to Danforth of $145,000 and granted stock options to purchase 116,891 shares of common stock at an exercise price of $1.43 per share to Mr. Geffken in 2019. See “Executive and Director Compensation—Executive Compensation Arrangements.”

Policies and Procedures for Related Person Transactions

Our board of directors has adopted a written related person transaction policy, to be effective upon the closing of this offering, setting forth the policies and procedures for the review and approval or ratification of related

person transactions. This policy will cover, with certain exceptions set forth in Item 404 of Regulation S-K under the Securities Act, any transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships, in which we were or are to be a participant, where the amount involved exceeds $120,000 in any fiscal year and a related person had, has or will have a direct or indirect material interest, including without limitation, purchases of goods or services by or from the related person or entities in which the related person has a material interest, indebtedness, guarantees of indebtedness and employment by us of a related person. In reviewing and approving any such transactions, our audit committee is tasked to consider all relevant facts and circumstances, including, but not limited to, whether the transaction is on terms comparable to those that could be obtained in an arm's length transaction and the extent of the related person's interest in the transaction. All of the transactions described in this section occurred prior to the adoption of this policy.

PRINCIPAL STOCKHOLDERS

The following table sets forth information with respect to the beneficial ownership of our common stock, as of September 30, 2020 by:

- each person or group of affiliated persons known by us to beneficially own more than 5% of our common stock;
- each of our named executive officers;
- each of our directors; and
- all of our executive officers and directors as a group.

The number of shares beneficially owned by each stockholder is determined under rules issued by the Securities and Exchange Commission. Under these rules, beneficial ownership includes any shares as to which the individual or entity has sole or shared voting power or investment power. Applicable percentage ownership is based on 68,241,937 shares of common stock outstanding as of September 30, 2020, assuming the conversion of all outstanding shares of preferred stock into common stock and after giving effect to the Series D-1 Closing. In computing the number of shares beneficially owned by an individual or entity and the percentage ownership of that person, shares of common stock subject to options, warrants or other rights held by such person that are currently exercisable or will become exercisable within 60 days of September 30, 2020 are considered outstanding, although these shares are not considered outstanding for purposes of computing the percentage ownership of any other person. Unless noted otherwise, the address of all listed stockholders is 125 Summer Street, Boston, MA 02110. Each of the stockholders listed has sole voting and investment power with respect to the shares beneficially owned by the stockholder unless noted otherwise, subject to community property laws where applicable.

Name of Beneficial Owner	Number of Shares of Common Stock	Percentage Before this Offering	Percentage After this Offering
5% or Greater Stockholders			
Morningside Investments Limited(1)	6,484,956	9.50%	
Entities Affiliated with Cormorant Private Healthcare Fund I, LP(2)	6,411,355	9.40%	
JPM Partners LLC(3)	5,925,000	8.68%	
Entities Affiliated with Bain Capital Life Sciences Investors, LLC(4)	5,365,659	7.86%	
Entities Affiliated with ABG-ATEAB LIMITED(5)	3,842,866	5.63%	
Named Executive Officers and Directors			
Jean-Pierre Sommadossi, Ph.D.(3)(6)	6,754,443	9.78%	
Andrea Corcoran(7)	806,337	1.18%	
Daniel Geffken(8)	73,056	*	
Franklin Berger(9)	788,772	1.16%	
Grigory Borisenko, Ph.D.	—	—	
Bihua Chen(2)	6,411,355	9.40%	
Isaac Cheng, M.D.	—	—	
Andrew Hack, M.D., Ph.D.(10)	—	—	
Bruno Lucidi(11)	172,916	*	
Polly A. Murphy, D.V.M., Ph.D.(12)	17,961	*	
Bruce Polsky, M.D.(13)	172,916	*	
All executive officers and directors as a group (15 persons)(14)	**15,415,053**	**22.47%**	**%**

* Less than 1%.

(1) Consists of 6,484,956 shares of common stock issuable upon conversion of shares of convertible preferred stock held by Morningside Venture Investments Limited ("Morningside"). Raymond Long Sing Tang, Frances Anne Elizabeth Richard, Peter Stuart Allenby Edwards and Jill Marie Franklin are directors of Morningside, and may be deemed to have joint voting and dispositive power with respect to the shares held by Morningside. Each of Mr. Tang, Ms. Richard, Mr. Edwards and Ms. Franklin disclaim beneficial ownership of the shares held by Morningside, except to the extent of his or her pecuniary interest therein, if any. The address of Morningside is 2nd Floor, Le Prince de Galles, 3-5 Avenue Citronniers, MC 98000, Monaco.

(2) Consists of (i) 3,106,168 shares of common stock issuable upon conversion of shares of convertible preferred stock held by Cormorant Private Healthcare Fund I, LP (Cormorant Fund I), (ii) 912,612 shares of common stock issuable upon conversion of shares of convertible preferred stock held by Cormorant Private Healthcare Fund II, LP ("Cormorant Fund II"), (iii) 2,043,170 shares of common stock issuable upon conversion of shares of convertible preferred stock held by Cormorant Global Healthcare Master Fund, LP ("Cormorant Master Fund") and (iv) 349,405 shares issuable upon conversion of shares of convertible preferred stock held by CRMA SPV, L.P. ("CRMA", and together with Cormorant Fund II and Cormorant Master Fund, the "Cormorant Funds"). Cormorant Global Healthcare GP, LLC ("Global GP") is the general partner of Cormorant Master Fund and Cormorant Private Healthcare 11 GP, LLC ("Private GP") is the general partner of Cormorant II. Bihua Chen, a director of the issuer, serves as the managing member of both Global GP and Private GP. Cormorant Asset Management LP serves as the investment manager to Cormorant Fund TI, Cormorant Master Fund and CRMA, and Ms. Chen serves as the managing member of Cormorant Asset Management GP, LLC. Ms. Chen has sole voting and investment control over the shares held by the Cormorant Funds. Ms. Chen disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. The address of the Cormorant Funds, Global GP, Private GP, Cormorant Asset Management LP, and Ms. Chen is 200 Clarendon Street, 52nd Floor, Boston, Massachusetts 02116.

(3) Consists of 5,175,000 shares of common stock and 750,000 shares of common stock issuable upon conversion of shares of convertible preferred stock held by JPM Partners LLC, of which Jean-Pierre Sommadossi, Ph.D. is the manager and may be deemed to have sole voting and dispositive power with respect to such shares.

(4) Consists of (i) 4,783,102 shares of common stock issuable upon conversion of shares of convertible preferred stock held by Bain Capital Life Sciences Fund II, L.P. ("BC LS") and (ii) 582,557 shares of common stock issuable upon conversion of shares of convertible preferred stock held by BCIP Life Sciences Associates, LP ("BCIP LS" and, together with BC LS, the "Bain Capital Life Sciences Entities"). Bain Capital Life Sciences Investors, LLC, whose managers are Jeffrey Schwartz and Adam Koppel, is the manager of the general partner of BC LS and governs the investment strategy and decision-making process with respect to investments held by BCIP LS. As a result, each of Bain Capital Life Sciences Investors, LLC, Mr. Schwartz and Dr. Koppel may be deemed to share voting and dispositive power over the shares held by the Bain Capital Life Sciences Entities. The address of the Bain Capital Life Sciences Entities is c/o Bain Capital Life Sciences, LP, 200 Clarendon Street, Boston, MA 02116.

(5) Consists of (i) 2,639,178 shares of common stock issuable upon conversion of shares of convertible preferred stock held by ABG-ATEAB Limited ("ABG-ATEAB"), (ii) 300,000 shares of common stock issuable upon conversion of shares of convertible preferred stock held by ABG-ATEA Limited ("ABG-ATEA"), and (iii) 903,688 shares of common stock issuable upon conversion of shares of convertible preferred stock held by Ally Bridge MedAlpha Master Fund L.P. ("MedAlpha"). ABG-ATEAB is a wholly-owned subsidiary of Ally Bridge Group Innovation Capital Partners III, L.P. ("ABG III"). ABG Innovation Capital Partners III GP Limited ("ABG III GP") is the general partner of ABG Innovation Capital Partners III GP, L.P. (together with ABG III and ABG III GP, the "ABG III Entities"), which is the general partner of ABG III. Mr Fan Yu is the sole shareholder and a director of ABG III GP and as such, Mr. Fan Yu and each of the ABG III Entities may be deemed to share beneficial ownership of the shares held of record by ABG-ATEAB. ABG-ATEA is a wholly-owned subsidiary of Ally Bridge Group ("ABG"). Ally Bridge Group (HK) Limited ("ABG HK") is ABG I's investment manager. Mr Fan Yu, a director of ABG I and ABG HK, owns the entire management share of ABG I and indirectly controls all equity interest in ABG HK and as such, Mr. Fan Yu and each of ABG I and ABG HK may be deemed to share beneficial ownership of the shares held of record by ABG-ATEA. With respect to MedAlpha, Mr. Fan Yu indirectly controls each of Ally Bridge MedAlpha Management GP, LLC and Ally Bridge Group (NY) LLC. Ally Bridge Group (NY) LLC and Ally Bridge MedAlpha Management L.P. acting through its general partner Ally Bridge MedAlpha Management GP, LLC manage MedAlpha's investments, and as such, each of the foregoing entities and Mr. Fan Yu may be deemed to share beneficial ownership of the shares of common stock held of record by MedAlpha. Each of the entities disclaims any such beneficial ownership described in this footnote. The address of ABG-ATEA and ABG-ATEAB is Unit 3002-3004, 30th Floor, Gloucester Tower, The Landmark, No. 15 Queen's Road, Central Hong Kong. The address of MedAlpha is 430 Park Avenue, Fl 12, New York, New York 10022.

(6) Consists of 829,443 shares of common stock which Dr. Sommadossi has the right to acquire pursuant to outstanding share options, including options that will be exercisable within 60 days of September 30, 2020.

(7) Includes (i) 500,000 shares of common stock and (ii) 173,333 shares of common stock which Ms. Corcoran has the right to acquire pursuant to outstanding share options, including options that will be exercisable within 60 days of September 30, 2020.

(8) Consists of 73,056 shares of common stock which Mr. Geffken has the right to acquire pursuant to outstanding share options, including options that will be exercisable within 60 days of September 30, 2020.

(9) Includes (i) 18,747 shares of common stock and (ii) 10,419 shares of common stock which Mr. Berger has the right to acquire pursuant to outstanding share options, including options that will be exercisable within 60 days of September 30, 2020.

(10) Does not include shares of common stock issuable upon conversion of shares of convertible preferred stock held by the Bain Capital Life Sciences Entities. Dr. Hack is a Managing Director of Bain Capital Life Sciences Investors, LLC. As a result, by virtue of the relationships described in footnote 4 above, Dr. Hack may be deemed to share beneficial ownership of such securities held by the Bain Capital Life Sciences Entities. The address of Dr. Hack is c/o Bain Capital Life Sciences, LP, 200 Clarendon Street, Boston, Massachusetts 02116.

(11) Includes (i) 50,000 shares of common stock and (ii) 122,916 shares of common stock which Mr. Lucidi has the right to acquire pursuant to outstanding share options, including options that will be exercisable within 60 days of September 30, 2020.

(12) Includes (i) 11,295 shares of common stock issuable upon conversion of shares of convertible preferred stock held by the Marc & Polly Murphy Revocable Family Trust dated March 13, 2002, of which Dr. Murphy has voting and dispositive control and (ii) 6,666 shares of common stock which Dr. Murphy has the right to acquire pursuant to outstanding share options, including options that will be exercisable within 60 days of September 30, 2020.

(13) Includes (i) 50,000 shares of common stock and (ii) 122,916 shares of common stock which Dr. Polsky has the right to acquire pursuant to outstanding share options, including options that will be exercisable within 60 days of September 30, 2020.

(14) Includes (i) 5,793,747 shares of common stock (ii) 13,941,515 shares of common stock issuable upon conversion of convertible preferred stock, and (iii) 1,473,538 shares of common stock which the executive officers and directors have the right to acquire pursuant to outstanding share options, including options that will be exercisable within 60 days of September 30, 2020.

DESCRIPTION OF CAPITAL STOCK

General

The following description summarizes some of the terms of our restated certificate of incorporation and amended and restated bylaws that will become effective upon the closing of this offering, the investors' rights agreement and of the General Corporation Law of the State of Delaware. Because it is only a summary, it does not contain all the information that may be important to you. For a complete description, you should refer to our restated certificate of incorporation, amended and restated bylaws and investors' rights agreement, copies of which have been or will be filed as exhibits to the registration statement of which this prospectus is a part, as well as the relevant provisions of the General Corporation Law of the State of Delaware. The description of our common stock and preferred stock reflects changes to our capital structure that will occur immediately prior the closing of this offering.

Following the closing of this offering, our authorized capital stock will consist of shares of common stock, par value $0.001 per share, and shares of preferred stock, par value $0.001 per share.

As of , 2020, there were shares of our common stock outstanding held of record by stockholders, including shares of unvested restricted common stock subject to repurchase by us, shares of Series A Preferred Stock held of record by stockholders, shares of Series B Preferred Stock held of record by stockholders, shares of Series C Preferred Stock held of record by stockholders, shares of Series D Preferred Stock held of record by stockholders, and shares of Series D-1 Preferred Stock held of record by stockholders.

Common Stock

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders shall be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Subject to the supermajority votes for some matters, other matters shall be decided by the affirmative vote of our stockholders having a majority in voting power of the votes cast by the stockholders present or represented and voting on such matter. Our restated certificate of incorporation and amended and restated bylaws also provide that our directors may be removed only for cause and only by the affirmative vote of the holders of at least two-thirds in voting power of the outstanding shares of capital stock entitled to vote thereon. In addition, the affirmative vote of the holders of at least two-thirds in voting power of the outstanding shares of capital stock entitled to vote thereon is required to amend or repeal, or to adopt any provision inconsistent with, several of the provisions of our restated certificate of incorporation. See below under " —Anti-Takeover Effects of Delaware Law and Our Certificate of Incorporation and Bylaws—Amendment of Charter Provisions." Holders of common stock are entitled to receive proportionately any dividends as may be declared by our board of directors, subject to any preferential dividend rights of any series of preferred stock that we may designate and issue in the future.

In the event of our liquidation or dissolution, the holders of common stock are entitled to receive proportionately our net assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock. Holders of common stock have no preemptive, subscription, redemption or conversion rights. Our outstanding shares of common stock are, and the shares offered by us in this offering will be, when issued and paid for, validly issued, fully paid and nonassessable. The rights, preferences and privileges of holders of common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Preferred Stock

Under the terms of our restated certificate of incorporation that will become effective upon the closing of this offering, our board of directors is authorized to direct us to issue shares of preferred stock in one or more series without stockholder approval. Our board of directors has the discretion to determine the rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences, of each series of preferred stock.

The purpose of authorizing our board of directors to issue preferred stock and determine its rights and preferences is to eliminate delays associated with a stockholder vote on specific issuances. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions, future financings and other corporate purposes, could have the effect of making it more difficult for a third party to acquire, or could discourage a third party from seeking to acquire, a majority of our outstanding voting stock. Upon the closing of this offering, there will be no shares of preferred stock outstanding, and we have no present plans to issue any shares of preferred stock.

Options

As of September 30, 2020, options to purchase 7,001,747 shares of our common stock were outstanding under our Prior Plan, of which 2,857,918 were exercisable and of which 4,143,829 were unvested as of that date.

Registration Rights

Holders of shares of our common stock are entitled to certain rights with respect to the registration of such shares for public resale under the Securities Act, pursuant to an amended and restated investors' rights agreement by and among us and certain of our stockholders, until the rights otherwise terminate pursuant to the terms of the investors' rights agreement. The registration of shares of common stock as a result of the following rights being exercised would enable holders to trade these shares without restriction under the Securities Act when the applicable registration statement is declared effective.

Form S-1 Registration Rights

If at any time beginning 180 days after the closing date of this offering the holders of a majority of registrable securities request in writing that we effect a registration with respect to all or part of such registrable securities then outstanding and having an anticipated gross aggregate offering price that would exceed $15,000,000, we may be required to register their shares; provided, however, that we will not be required to effect such a registration if, within any twelve month period, we have already effected two registrations on Form S-1 for the holders of registrable securities. If the holders requesting registration intend to distribute their shares by means of an underwriting, the managing underwriter of such offering will have the right to limit the numbers of shares to be underwritten for reasons related to the marketing of the shares.

Piggyback Registration Rights

If at any time after this offering we propose to register any shares of our common stock under the Securities Act, subject to certain exceptions, the holders of registrable securities will be entitled to notice of the registration and to include their shares of registrable securities in the registration. If our proposed registration involves an underwriting, the managing underwriter of such offering will have the right to limit the number of shares to be underwritten for reasons related to the marketing of the shares.

Form S-3 Registration Rights

If, at any time after we become entitled under the Securities Act to register our shares on a registration statement on Form S-3, the holders of at least 30% of the then outstanding registrable securities request in writing that we effect a registration with respect to registrable securities at an aggregate price to the public in the offering of at least $5,000,000, we will be required to effect such registration; provided, however, that we will not be required to effect such a registration if, within any twelve month period, we have already effected two registrations on Form S-3 for the holders of registrable securities.

Expenses and Indemnification

Ordinarily, other than underwriting discounts and commissions and subject to certain exceptions, we will be required to pay all expenses incurred by us related to any registration effected pursuant to the exercise of these registration rights. These expenses may include all registration and filing fees, printing expenses, fees and disbursements of our counsel, reasonable fees and disbursements, not to exceed $20,000, of a counsel for the selling security holders and blue sky fees and expenses. Additionally, we have agreed to indemnify selling stockholders for damages, and any legal or other expenses reasonably incurred, arising from or based upon any untrue statement of a material fact contained in any registration statement, an omission or alleged omission to state a material fact in any registration statement or necessary to make the statements therein not misleading, or any violation or alleged violation by the indemnifying party of securities laws, subject to certain exceptions.

Termination of Registration Rights

The registration rights terminate upon the earliest to occur of three years after the effective date of the registration statement of which this prospectus is a part, the closing of a deemed liquidation event, or such time as an exemption under the Securities Act is available for the sale of all of the registrable securities..

Anti-Takeover Effects of Delaware Law and Our Certificate of Incorporation and Bylaws

Some provisions of Delaware law, our restated certificate of incorporation and our restated bylaws could make the following transactions more difficult: an acquisition of us by means of a tender offer; an acquisition of us by means of a proxy contest or otherwise; or the removal of our incumbent officers and directors. It is possible that these provisions could make it more difficult to accomplish or could deter transactions that stockholders may otherwise consider to be in their best interest or in our best interests, including transactions which provide for payment of a premium over the market price for our shares.

These provisions, summarized below, are intended to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that the benefits of the increased protection of our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us outweigh the disadvantages of discouraging these proposals because negotiation of these proposals could result in an improvement of their terms.

Undesignated Preferred Stock

The ability of our board of directors, without action by the stockholders, to issue up to shares of undesignated preferred stock with voting or other rights or preferences as designated by our board of directors could impede the success of any attempt to change control of us. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of our company.

Stockholder Meetings

Our restated bylaws provide that a special meeting of stockholders may be called only by our chairman of the board, chief executive officer or president (in the absence of a chief executive officer), or by a resolution adopted by a majority of our board of directors.

Requirements for Advance Notification of Stockholder Nominations and Proposals

Our restated bylaws establish advance notice procedures with respect to stockholder proposals to be brought before a stockholder meeting and the nomination of candidates for election as directors, other than nominations made by or at the direction of the board of directors or a committee of the board of directors.

Elimination of Stockholder Action by Written Consent

Our restated certificate of incorporation eliminates the right of stockholders to act by written consent without a meeting.

Staggered Board

Our board of directors is divided into three classes. The directors in each class will serve for a three-year term, one class being elected each year by our stockholders. For more information on the classified board, see “Management—Board Composition and Election of Directors.” This system of electing and removing directors may tend to discourage a third-party from making a tender offer or otherwise attempting to obtain control of us, because it generally makes it more difficult for stockholders to replace a majority of the directors.

Removal of Directors

Our restated certificate of incorporation provides that no member of our board of directors may be removed from office by our stockholders except for cause and, in addition to any other vote required by law, upon the approval of the holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote in the election of directors.

Stockholders Not Entitled to Cumulative Voting

Our restated certificate of incorporation does not permit stockholders to cumulate their votes in the election of directors. Accordingly, the holders of a majority of the outstanding shares of our common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they choose, other than any directors that holders of our preferred stock may be entitled to elect.

Delaware Anti-Takeover Statute

We are subject to Section 203 of the General Corporation Law of the State of Delaware, which prohibits persons deemed to be “interested stockholders” from engaging in a “business combination” with a publicly held Delaware corporation for three years following the date these persons become interested stockholders unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. Generally, an “interested stockholder” is a person who, together with affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation’s voting stock. Generally, a “business combination” includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. The existence of this provision may have an anti-takeover effect with respect to transactions not approved in advance by the board of directors.

Choice of Forum

Our restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative form, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for: (1) any derivative action or proceeding brought on our behalf; (2) any action asserting a claim of breach of a fiduciary duty or other wrongdoing by any of our directors, officers, employees or agents to us or our stockholders; (3) any action asserting a claim against us arising pursuant to any provision of the General Corporation Law of the State of Delaware or our certificate of incorporation or bylaws; (4) any action to interpret, apply, enforce or determine the validity of our certificate of incorporation or bylaws; or (5) any action asserting a claim governed by the internal affairs doctrine; provided that the exclusive forum provisions will not apply to suits brought to enforce any liability or duty created by the Securities Act or the Exchange Act, or to any claim for which the federal courts have exclusive jurisdiction. For instance, the provision would not apply to actions arising under federal securities laws, including suits brought to enforce any liability or duty created by the Securities Act, Exchange Act, or the rules and regulations thereunder. Our restated certificate of incorporation further provides that, unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States of America shall, to the fullest extent permitted by law, be the sole and exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. Our restated certificate of incorporation also provides that any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock will be deemed to have notice of and to have consented to this choice of forum provision. It is possible that a court of law could rule that the choice of forum provision contained in our restated certificate of incorporation is inapplicable or unenforceable if it is challenged in a proceeding or otherwise.

Amendment of Charter Provisions

The amendment of any of the above provisions, except for the provision making it possible for our board of directors to issue preferred stock and the provision prohibiting cumulative voting, would require approval by holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote thereon.

The provisions of Delaware law, our restated certificate of incorporation and our restated bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions may also have the effect of preventing changes in the composition of our board and management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interests

Transfer Agent and Registrar

The transfer agent and registrar for our common stock will be American Stock Transfer & Trust Company, LLC.

Stock Exchange Listing

We intend to apply to have our common stock listed on The Nasdaq Global Market under the symbol “AVIR.”

SHARES ELIGIBLE FOR FUTURE SALE

Immediately prior to this offering, there was no public market for our common stock. Future sales of substantial amounts of common stock in the public market, or the perception that such sales may occur, could adversely affect the market price of our common stock.

Upon the closing of this offering, we will have outstanding an aggregate of shares of common stock, assuming the issuance of shares of common stock offered by us in this offering, the automatic conversion of all outstanding shares of our preferred stock into shares of our common stock and no exercise of options after September 30, 2020. Of these shares, all shares sold in this offering will be freely tradable without restriction or further registration under the Securities Act, except for any shares purchased by our "affiliates," as that term is defined in Rule 144 under the Securities Act, whose sales would be subject to the Rule 144 resale restrictions described below, other than the holding period requirement.

The remaining shares of common stock will be "restricted securities," as that term is defined in Rule 144 under the Securities Act. These restricted securities are eligible for public sale only if they are registered under the Securities Act or if they qualify for an exemption from registration under Rules 144 or 701 under the Securities Act, which are summarized below. We expect that substantially all of these shares will be subject to the 180-day lock-up period under the lock-up agreements described below. Upon expiration of the lock-up period, we estimate that approximately shares will be available for sale in the public market, subject in some cases to applicable volume limitations under Rule 144.

In addition, of the 7,001,747 shares of our common stock that were subject to stock options outstanding as of September 30, 2020, options to purchase 2,857,918 shares of common stock were vested as of September 30, 2020 and, upon exercise, these shares will be eligible for sale subject to the lock–up agreements described below and Rules 144 and 701 under the Securities Act.

Lock-Up Agreements

We and each of our directors and executive officers and holders of substantially all of our outstanding capital stock, have agreed that, without the prior written consent of J.P. Morgan Securities LLC, Morgan Stanley & Co. LLC, Evercore Group L.L.C. and William Blair & Company, L.L.C., we and they will not, subject to certain exceptions, during the period ending 180 days after the date of this prospectus, offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for common stock; or enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of our common stock, whether any transaction described above is to be settled by delivery of our common stock or such other securities, in cash or otherwise.

Upon the expiration of the applicable lock-up periods, all of the shares subject to such lock-up restrictions will become eligible for sale, subject to the limitations discussed above. For a further description of these lock-up agreements, please see "Underwriting."

Rule 144

Affiliate Resales of Restricted Securities

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is an affiliate of ours, or who was an affiliate at any time during the 90 days before a sale,

who has beneficially owned shares of our common stock for at least six months would be entitled to sell in "broker's transactions" or certain "riskless principal transactions" or to market makers, a number of shares within any three-month period that does not exceed the greater of:

- 1% of the number of shares of our common stock then outstanding, which will equal approximately shares immediately after this offering; or
- the average weekly trading volume in our common stock on The Nasdaq Global Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to such sale.

Affiliate resales under Rule 144 are also subject to the availability of current public information about us. In addition, if the number of shares being sold under Rule 144 by an affiliate during any three-month period exceeds 5,000 shares or has an aggregate sale price in excess of $50,000, the seller must file a notice on Form 144 with the Securities and Exchange Commission and Nasdaq concurrently with either the placing of a sale order with the broker or the execution directly with a market maker.

Non-Affiliate Resales of Restricted Securities

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is not an affiliate of ours at the time of sale, and has not been an affiliate at any time during the three months preceding a sale, and who has beneficially owned shares of our common stock for at least six months but less than a year, is entitled to sell such shares subject only to the availability of current public information about us. If such person has held our shares for at least one year, such person can resell under Rule 144(b)(1) without regard to any Rule 144 restrictions, including the 90-day public company requirement and the current public information requirement.

Non-affiliate resales are not subject to the manner of sale, volume limitation or notice filing provisions of Rule 144.

Rule 701

In general, under Rule 701, any of an issuer's employees, directors, officers, consultants or advisors who purchases shares from the issuer in connection with a compensatory stock or option plan or other written agreement before the effective date of a registration statement under the Securities Act is entitled to sell such shares 90 days after such effective date in reliance on Rule 144. An affiliate of the issuer can resell shares in reliance on Rule 144 without having to comply with the holding period requirement, and non-affiliates of the issuer can resell shares in reliance on Rule 144 without having to comply with the current public information and holding period requirements.

The Securities and Exchange Commission has indicated that Rule 701 will apply to typical stock options granted by an issuer before it becomes subject to the reporting requirements of the Exchange Act, along with the shares acquired upon exercise of such options, including exercises after an issuer becomes subject to the reporting requirements of the Exchange Act.

Equity Plans

We intend to file one or more registration statements on Form S-8 under the Securities Act to register all shares of common stock subject to outstanding stock options and common stock issued or issuable under our stock plans. We expect to file the registration statement covering shares offered pursuant to our stock plans shortly after the date of this prospectus, permitting the resale of such shares by non-affiliates in the public market without restriction under the Securities Act and the sale by affiliates in the public market, subject to compliance with the resale provisions of Rule 144.

Registration Rights

Upon the closing of this offering, the holders of shares of common stock, which includes all of the shares of common stock issuable upon the automatic conversion of our preferred stock upon the closing of this offering, or their transferees will be entitled to various rights with respect to the registration of these shares under the Securities Act. Registration of these shares under the Securities Act would result in these shares becoming fully tradable without restriction under the Securities Act immediately upon the effectiveness of the registration, except for shares purchased by affiliates. See “Description of Capital Stock—Registration Rights” for additional information. Shares covered by a registration statement will be eligible for sale in the public market upon the expiration or release from the terms of the lock-up agreement described above.

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES TO NON-U.S. HOLDERS

The following discussion is a summary of the material U.S. federal income tax consequences to non-U.S. holders (as defined below) of the purchase, ownership and disposition of the shares of common stock issued pursuant to this offering, but does not purport to be a complete analysis of all potential tax effects. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or foreign tax laws are not discussed. This discussion is based on the Internal Revenue Code of 1986, as amended, or the Code, Treasury Regulations promulgated thereunder, judicial decisions, and published rulings and administrative pronouncements of the U.S. Internal Revenue Service, or IRS, in each case in effect as of the date of this offering. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a non-U.S. holder. We have not sought and will not seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a contrary position to that discussed below regarding the tax consequences of the purchase, ownership, and disposition of our common stock.

This discussion is limited to non-U.S. holders that hold our common stock as a “capital asset” within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to a non-U.S. holder’s particular circumstances, including the impact of the alternative minimum tax or the Medicare contribution tax on net investment income. In addition, it does not address consequences relevant to holders subject to particular rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the United States;
- persons holding our common stock as part of a hedge, straddle or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies, and other financial institutions;
- brokers, dealers or traders in securities;
- “controlled foreign corporations,” “passive foreign investment companies,” and corporations that accumulate earnings to avoid U.S. federal income tax;
- partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and investors therein);
- tax-exempt organizations or governmental organizations;
- persons deemed to sell our common stock under the constructive sale provisions of the Code;
- persons for whom our common stock constitutes “qualified small business stock” within the meaning of Section 1202 of the Code;
- “qualified foreign pension funds” as defined in Section 897(l)(2) of the Code and entities all of the interests of which are held by qualified foreign pension funds;
- persons subject to special tax accounting rules as a result of any item of gross income with respect to the stock being taken into account in an applicable financial statement. and
- tax-qualified retirement plans.

If an entity or arrangement treated as a partnership for U.S. federal income tax purposes) holds our common stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of

the partnership and certain determinations made at the partner level. Accordingly, partnerships holding our common stock and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

INVESTORS SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

Definition of a Non-U.S. Holder

For purposes of this discussion, a “non-U.S. holder” is any beneficial owner of our common stock that is neither a “U.S. person” nor an entity treated as a partnership for U.S. federal income tax purposes. A U.S. person is any person that, for U.S. federal income tax purposes, is:

- an individual who is a citizen or resident of the United States;
- a corporation (or other entity treated as a corporation for U.S. federal income tax purposes) created or organized under the laws of the United States, any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (1) is subject to the primary supervision of a U.S. court and the control of one or more United States persons (within the meaning of Section 7701(a)(30) of the Code), or (2) has made a valid election under applicable Treasury Regulations to continue to be treated as a United States person for U.S. federal income tax purposes.

Distributions

As described in the section in this prospectus titled “Dividend Policy,” we do not anticipate declaring or paying dividends to holders of our common stock in the foreseeable future. However, if we do make distributions of cash or property on our common stock, such distributions will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Amounts not treated as dividends for U.S. federal income tax purposes will constitute a return of capital and first be applied against and reduce a non-U.S. holder’s adjusted tax basis in its common stock, but not below zero. Any excess will be treated as capital gain and will be treated as described below under “—Sale or Other Taxable Disposition of Common Stock.”

Subject to the discussion below on effectively connected income, dividends paid to a non-U.S. holder of our common stock will be subject to U.S. federal withholding tax at a rate of 30% of the gross amount of the dividends (or such lower rate specified by an applicable income tax treaty, provided the non-U.S. holder furnishes a valid IRS Form W-8BEN or W-8BEN-E (or other applicable documentation) certifying qualification for the lower treaty rate). A non-U.S. holder that does not timely furnish the required documentation, but that qualifies for a reduced treaty rate, may obtain a refund of any excess amounts withheld by timely filing an appropriate claim for refund with the IRS. Non-U.S. holders should consult their tax advisors regarding their entitlement to benefits under any applicable income tax treaty.

If dividends paid to a non-U.S. holder are effectively connected with the non-U.S. holder’s conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the non-U.S. holder maintains a permanent establishment or fixed base in the United States to which such dividends are attributable),

the non-U.S. holder will be exempt from the U.S. federal withholding tax described above. To claim the exemption, the non-U.S. holder must furnish to the applicable withholding agent a valid IRS Form W-8ECI, certifying that the dividends are effectively connected with the non-U.S. holder's conduct of a trade or business within the United States.

Any such effectively connected dividends will be subject to U.S. federal income tax on a net income basis at the regular graduated rates applicable to United States persons. A non-U.S. holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected dividends, as adjusted for certain items. Non-U.S. holders should consult their tax advisors regarding any applicable tax treaties that may provide for different rules. ***Sale or Other Taxable Disposition of Common Stock***

A non-U.S. holder will not be subject to U.S. federal income tax on any gain realized upon the sale or other taxable disposition of our common stock unless:

- the gain is effectively connected with the non-U.S. holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the non-U.S. holder maintains a permanent establishment or fixed base in the United States to which such gain is attributable);
- the non-U.S. holder is a nonresident alien individual present in the United States for 183 days or more during the taxable year of the disposition and certain other requirements are met; or
- our common stock constitutes a U.S. real property interest, or USRPI, by reason of our status as a U.S. real property holding corporation, or USRPHC, for U.S. federal income tax purposes.

Gain described in the first bullet point above generally will be subject to U.S. federal income tax on a net income basis at the regular U.S. federal income tax rates. A non-U.S. holder that is a foreign corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected gain, as adjusted for certain items.

A non-U.S. holder described in the second bullet point above will be subject to U.S. federal income tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on any gain derived from the disposition, which may be offset by certain U.S. source capital losses of the non-U.S. holder (even though the individual is not considered a resident of the United States) provided the non-U.S. holder has timely filed U.S. federal income tax returns with respect to such losses.

With respect to the third bullet point above, we believe we are not currently and do not anticipate becoming a USRPHC. Because the determination of whether we are a USRPHC depends on the fair market value of our USRPIs relative to the fair market value of our other business assets and our non-U.S. real property interests, if any, however, there can be no assurance we are not a USRPHC or will not become one in the future. Even if we are or were to become a USRPHC, gain arising from the sale or other taxable disposition of our common stock by a non-U.S. holder will not be subject to U.S. federal income tax if our common stock is "regularly traded," as defined by applicable Treasury Regulations, on an established securities market, and such non-U.S. holder owned, actually and constructively, 5% or less of our common stock throughout the shorter of the five-year period ending on the date of the sale or other taxable disposition or the non-U.S. holder's holding period.

Non-U.S. holders should consult their tax advisors regarding potentially applicable income tax treaties that may provide for different rules.

Information Reporting and Backup Withholding

Payments of dividends on our common stock will not be subject to backup withholding, provided the applicable withholding agent does not have actual knowledge or reason to know the holder is a United States person and

the holder either certifies its non-U.S. status, such as by furnishing a valid IRS Form W-8BEN, W-8BEN-E or W-8ECI, or otherwise establishes an exemption. However, information returns are required to be filed with the IRS in connection with any distributions on our common stock paid to the non-U.S. holder, regardless of whether such distributions constitute dividends or whether any tax was actually withheld. Copies of these information returns may also be made available under the provisions of a specific treaty or agreement to the tax authorities of the country in which the non-U.S. holder resides or is established.

In addition, the proceeds of a sale or other taxable disposition of our common stock within the United States or conducted through certain U.S.-related brokers generally will not be subject to backup withholding or information reporting, if the applicable withholding agent receives the certification described above and does not have actual knowledge or reason to know that such holder is a United States person or such holder otherwise establishes an exemption. Proceeds of a disposition of our common stock conducted through a non-U.S. office of a non-U.S. broker generally will not be subject to backup withholding or information reporting.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a non-U.S. holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Additional Withholding Tax on Payments Made to Foreign Accounts

Withholding taxes may be imposed under Sections 1471 to 1474 of the Code (such Sections commonly referred to as the Foreign Account Tax Compliance Act, or FATCA) on certain types of payments made to non-U.S. financial institutions and certain other non-U.S. entities. Specifically, a 30% withholding tax may be imposed on dividends on, or (subject to the proposed Treasury Regulations discussed below) gross proceeds from the sale or other disposition of our common stock paid to a "foreign financial institution" or a "non-financial foreign entity" (each as defined in the Code), unless (1) the foreign financial institution undertakes certain diligence and reporting obligations, (2) the non-financial foreign entity either certifies it does not have any "substantial United States owners" (as defined in the Code) or furnishes identifying information regarding each substantial United States owner, or (3) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules. If the payee is a foreign financial institution and is subject to the diligence and reporting requirements in (1) above, it must enter into an agreement with the U.S. Department of the Treasury requiring, among other things, that it undertake to identify accounts held by certain "specified United States persons" or "United States-owned foreign entities" (each as defined in the Code), annually report certain information about such accounts, and withhold 30% on certain payments to non-compliant foreign financial institutions and certain other account holders. Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States governing FATCA may be subject to different rules.

Under the applicable Treasury Regulations and administrative guidance, withholding under FATCA generally applies to payments of dividends paid on our common stock. While withholding under FATCA would have applied also to payments of gross proceeds from the sale or other disposition of stock on or after January 1, 2019, proposed Treasury Regulations eliminate FATCA withholding on payments of gross proceeds entirely. Taxpayers (and withholding agents) generally may rely on these proposed Treasury Regulations until final Treasury Regulations are issued. Prospective investors should consult their tax advisors regarding the potential application of withholding under FATCA to their investment in our common stock.

UNDERWRITING

We are offering the shares of common stock described in this prospectus through a number of underwriters. J.P. Morgan Securities LLC, Morgan Stanley & Co. LLC, Evercore Group L.L.C. and William Blair & Company, L.L.C. are acting as joint book-running managers of the offering and as representatives of the underwriters. We have entered into an underwriting agreement with the representatives. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to the underwriters, and each underwriter has severally agreed to purchase, at the public offering price less the underwriting discounts and commissions set forth on the cover page of this prospectus, the number of shares of common stock listed next to its name in the following table:

Name	Number of Shares
J.P. Morgan Securities LLC	
Morgan Stanley & Co. LLC	
Evercore Group L.L.C.	
William Blair & Company, L.L.C.	
Total	

The underwriters are committed to purchase all the common shares offered by us if they purchase any shares. The underwriting agreement also provides that if an underwriter defaults, the purchase commitments of non-defaulting underwriters may also be increased or the offering may be terminated.

The underwriters propose to offer the common shares directly to the public at the initial public offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of $ per share. Any such dealers may resell shares to certain other brokers or dealers at a discount of up to $ per share from the initial public offering price. After the initial offering of the shares to the public, if all of the common shares are not sold at the initial public offering price, the underwriters may change the offering price and the other selling terms. Sales of any shares made outside of the United States may be made by affiliates of the underwriters.

The underwriters have an option to buy up to additional shares of common stock from us to cover sales of shares by the underwriters which exceed the number of shares specified in the table above. The underwriters have 30 days from the date of this prospectus to exercise this option to purchase additional shares. If any shares are purchased with this option to purchase additional shares, the underwriters will purchase shares in approximately the same proportion as shown in the table above. If any additional shares of common stock are purchased, the underwriters will offer the additional shares on the same terms as those on which the shares are being offered.

The underwriting fee is equal to the public offering price per share of common stock less the amount paid by the underwriters to us per share of common stock. The underwriting fee is $ per share. The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters assuming both no exercise and full exercise of the underwriters' option to purchase additional shares.

	Without option to purchase additional shares exercise	With full option to purchase additional shares exercise
Per Share	$	$
Total	$	$

We estimate that the total expenses of this offering, including registration, filing and listing fees, printing fees and legal and accounting expenses, but excluding the underwriting discounts and commissions, will be approximately $. We have agreed to reimburse the underwriters for expenses of up to $ related to clearance of this offering with the Financial Industry Regulatory Authority, or FINRA.

A prospectus in electronic format may be made available on the web sites maintained by one or more underwriters, or selling group members, if any, participating in this offering. The underwriters may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives to underwriters and selling group members that may make Internet distributions on the same basis as other allocations.

We have agreed that we will not (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, or submit to, or file with, the Securities and Exchange Commission a registration statement under the Securities Act relating to, any shares of our common stock or securities convertible into or exercisable or exchangeable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, loan, disposition or filing, or (ii) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of any shares of common stock or any such other securities (regardless of whether any of these transactions are to be settled by the delivery of shares of common stock or such other securities, in cash or otherwise), in each case without the prior written consent of J.P. Morgan Securities LLC, Morgan Stanley & Co. LLC, Evercore Group L.L.C. and William Blair & Company, L.L.C. for a period of 180 days after the date of this prospectus, other than the shares of our common stock to be sold in this offering.

The restrictions on our actions, as described above, do not apply to (i) the issuance of shares of common stock or securities convertible into or exercisable for shares of our common stock pursuant to the conversion or exchange of convertible or exchangeable securities or the exercise of warrants or options (including net exercise) or the settlement of restricted stock units (“RSU”) (including net settlement), in each case outstanding on the date of the underwriting agreement and described in this prospectus; (ii) grants of stock options, stock awards, restricted stock, RSUs, or other equity awards and the issuance of shares of our common stock or securities convertible into or exercisable or exchangeable for shares of our common stock (whether upon the exercise of stock options or otherwise) to our employees, officers, directors, advisors, or consultants pursuant to the terms of an equity compensation plan in effect as of the closing of this offering and described in this prospectus; (iii) the issuance of up to 5% of the outstanding shares of our common stock, or securities convertible into, exercisable for, or which are otherwise exchangeable for, our common stock, immediately following the closing of this offering, in acquisitions or other similar strategic transactions; or (iv) our filing of any registration statement on Form S-8 relating to securities granted or to be granted pursuant to any plan in effect on the date of the underwriting agreement and described in this prospectus or any assumed benefit plan pursuant to an acquisition or similar strategic transaction; provided that the recipient of any such shares or securities issued or granted pursuant to clauses (i), (ii) and (iii) during the 180-day restriction period described above shall enter into a “lock-up” agreement with the underwriters.

Our directors, executive officers and our shareholders (such persons, the “lock-up parties”) have entered into lock-up agreements with the underwriters prior to the commencement of this offering pursuant to which each lock-up party, with limited exceptions, for a period of 180 days after the date of this prospectus (such period, the “restricted period”), may not (and may not cause any of their direct or indirect affiliates to), without the prior written consent of J.P. Morgan Securities LLC, Morgan Stanley & Co. LLC, Evercore Group L.L.C. and William Blair & Company, L.L.C., (1) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into

or exercisable or exchangeable for our common stock (including, without limitation, common stock or such other securities which may be deemed to be beneficially owned by such lock-up parties in accordance with the rules and regulations of the Securities and Exchange Commission and securities which may be issued upon exercise of a stock option or warrant) (collectively with the common stock, the "lock-up securities"), (2) enter into any hedging, swap or other agreement or transaction that transfers, in whole or in part, any of the economic consequences of ownership of the lock-up securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of lock-up securities, in cash or otherwise, (3) make any demand for, or exercise any right with respect to, the registration of any lock-up securities, or (4) publicly disclose the intention to do any of the foregoing. Such persons or entities have further acknowledged and agreed that these undertakings preclude them from engaging in any hedging or other transactions or arrangements (including, without limitation, any short sale or the purchase or sale of, or entry into, any put or call option, or combination thereof, forward, swap or any other derivative transaction or instrument, however described or defined) designed or intended, or which could reasonably be expected to lead to or result in, a sale or disposition or transfer (by any person or entity, whether or not a signatory to such agreement) of any economic consequences of ownership, in whole or in part, directly or indirectly, of any lock-up securities, whether any such transaction or arrangement (or instrument provided for thereunder) would be settled by delivery of lock-up securities, in cash or otherwise.

The restrictions described in the immediately preceding paragraph and contained in the lock-up agreements between the underwriters and the lock-up parties do not apply, subject in certain cases to various conditions, to certain transactions, including (a) transfers of lock-up securities: (i) as bona fide gifts, or for bona fide estate planning purposes, (ii) by will or intestacy, (iii) to any trust for the direct or indirect benefit of the lock-up party or any immediate family member, or if the lock-up party is a trust, to a trustor or beneficiary of the trust or to the estate of a beneficiary of such trust, (iv) to a partnership, limited liability company or other entity of which are controlled or managed by the lock-up party or its immediate family members or under common control of the lock-up party, (v) to a nominee or custodian of a person or entity to whom a disposition or transfer would be permissible under clauses (i) through (iv), (vi) in the case of a corporation, partnership, limited liability company, trust or other business entity, (A) to another corporation, partnership, limited liability company, trust or other business entity that is an affiliate of the lock-up party, or to any investment fund or other entity controlling, controlled by, managing or managed by or under common control with the lock-up party or its affiliates or (B) as part of a distribution to members or stockholders of the lock-up party; (vii) by operation of law, (viii) to us from an employee upon death, disability or termination of employment of such employee, (ix) as part of a sale of lock-up securities acquired in this offering or in open market transactions after the completion of this offering, (x) to us in connection with the vesting, settlement, or exercise of restricted stock units, options, warrants or other rights to purchase shares of our common stock (including "net" or "cashless" exercise), including for the payment of exercise price and tax and remittance payments, provided that any such shares of common stock received upon such exercise, vesting or settlement shall be subject to a similar lock-up agreement with the underwriters, and provided further that any such restricted stock units, options, warrants or rights are held by the lock-up parties pursuant to an agreement or equity awards granted under a stock incentive plan or other equity award plan, each such agreement or plan which is described herein, or (xi) pursuant to a bona fide third-party tender offer, merger, consolidation or other similar transaction approved by our board of directors and made to all shareholders involving a change in control, provided that if such transaction is not completed, all such lock-up securities would remain subject to the restrictions in the immediately preceding paragraph; (b) exercise of the options, settlement of RSUs or other equity awards, or the exercise of warrants granted pursuant to plans described in this prospectus, provided that any lock-up securities received upon such exercise, vesting or settlement would be subject to a similar lock-up agreement with the underwriters; (c) the conversion of outstanding preferred stock, warrants to acquire preferred stock, or convertible securities into shares of our common stock or warrants to acquire shares of our common stock,

provided that any common stock or warrant received upon such conversion would be subject to a similar lock-up agreement with the underwriters; and (d) the establishment by lock-up parties of trading plans under Rule 10b5-1 under the Exchange Act, provided that (i) such plan does not provide for the transfer of lock-up securities during the restricted period and (ii) no filing by any party under the Exchange Act or other public announcement shall be required or made voluntarily in connection with such trading plan;

provided that (A) in the case of any transfer or distribution pursuant to clause (a)(i), (ii), (iii), (iv), (v), (vi) and (vii), such transfer shall not involve a disposition for value and each donee, devisee, transferee or distributee shall enter into a similar lock-up agreement with the underwriters and (B) in the case of any transfer or distribution pursuant to clause (a) (i), (ii), (iii), (iv), (v), (vi), (ix) and (x), no filing by any party (donor, donee, devisee, transferor, transferee, distributer or distributee) under the Exchange Act, or other public announcement shall be required or shall be made voluntarily in connection with such transfer or distribution (other than a filing on a Form 5 made after the expiration of the restricted period). J.P. Morgan Securities LLC, Morgan Stanley & Co. LLC, Evercore Group L.L.C. and William Blair & Company, L.L.C., in their sole discretion, may release the securities subject to any of the lock-up agreements with the underwriters described above, in whole or in part at any time.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act of 1933.

We have applied to have our common stock approved for listing/quotation on The Nasdaq Global Market under the symbol “AVIR.”

In connection with this offering, the underwriters may engage in stabilizing transactions, which involves making bids for, purchasing and selling shares of common stock in the open market for the purpose of preventing or retarding a decline in the market price of the common stock while this offering is in progress. These stabilizing transactions may include making short sales of common stock, which involves the sale by the underwriters of a greater number of shares of common stock than they are required to purchase in this offering, and purchasing shares of common stock on the open market to cover positions created by short sales. Short sales may be “covered” shorts, which are short positions in an amount not greater than the underwriters’ option to purchase additional shares referred to above, or may be “naked” shorts, which are short positions in excess of that amount. The underwriters may close out any covered short position either by exercising their option to purchase additional shares, in whole or in part, or by purchasing shares in the open market. In making this determination, the underwriters will consider, among other things, the price of shares available for purchase in the open market compared to the price at which the underwriters may purchase shares through the option to purchase additional shares. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market that could adversely affect investors who purchase in this offering. To the extent that the underwriters create a naked short position, they will purchase shares in the open market to cover the position.

The underwriters have advised us that, pursuant to Regulation M of the Securities Act of 1933, they may also engage in other activities that stabilize, maintain or otherwise affect the price of the common stock, including the imposition of penalty bids. This means that if the representatives of the underwriters purchase common stock in the open market in stabilizing transactions or to cover short sales, the representatives can require the underwriters that sold those shares as part of this offering to repay the underwriting discount received by them.

These activities may have the effect of raising or maintaining the market price of the common stock or preventing or retarding a decline in the market price of the common stock, and, as a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If the underwriters commence these activities, they may discontinue them at any time. The underwriters may carry out these transactions on The Nasdaq Global Market, in the over-the-counter market or otherwise.

Prior to this offering, there has been no public market for our common stock. The initial public offering price will be determined by negotiations between us and the representatives of the underwriters. In determining the initial public offering price, we and the representatives of the underwriters expect to consider a number of factors including:

the information set forth in this prospectus and otherwise available to the representatives;

our prospects and the history and prospects for the industry in which we compete;

an assessment of our management;

our prospects for future earnings;

the general condition of the securities markets at the time of this offering;

the recent market prices of, and demand for, publicly traded common stock of generally comparable companies; and other factors deemed relevant by the underwriters and us.

Neither we nor the underwriters can assure investors that an active trading market will develop for our common shares, or that the shares will trade in the public market at or above the initial public offering price.

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

Other Activities and Relationships

Certain of the underwriters and their affiliates have provided in the past to us and our affiliates and may provide from time to time in the future certain commercial banking, financial advisory, investment banking and other services for us and such affiliates in the ordinary course of their business, for which they have received and may continue to receive customary fees and commissions. William Blair & Company, L.L.C. provided certain financial advisory and investment banking services in connection with our Series D closings. In addition, from time to time, certain of the underwriters and their affiliates may effect transactions for their own account or the account of customers, and hold on behalf of themselves or their customers, long or short positions in our debt or equity securities or loans, and may do so in the future.

Selling Restrictions

Notice to prospective investors in European Economic Area and United Kingdom

In relation to each Member State of the European Economic Area and the United Kingdom (each a “Relevant State”), no shares have been offered or will be offered pursuant to the offering to the public in that Relevant State prior to the publication of a prospectus in relation to the shares which has been approved by the competent authority in that Relevant State or, where appropriate, approved in another Relevant State and notified to the competent authority in that Relevant State, all in accordance with the Prospectus Regulation,

except that it may make an offer to the public in that Relevant State of any shares at any time under the following exemptions under the Prospectus Regulation:

(a) to any legal entity which is a qualified investor as defined under the Prospectus Regulation;

(b) to fewer than 150 natural or legal persons (other than qualified investors as defined under the Prospectus Regulation), subject to obtaining the prior consent of representatives for any such offer; or

(c) in any other circumstances falling within Article 1(4) of the Prospectus Regulation,

provided that no such offer of the shares shall require the Issuer or any Manager to publish a prospectus pursuant to Article 3 of the Prospectus Regulation or supplement a prospectus pursuant to Article 23 of the Prospectus Regulation.

For the purposes of this provision, the expression an “offer to the public” in relation to the shares in any Relevant State means the communication in any form and by any means of sufficient information on the terms of the offer and any shares to be offered so as to enable an investor to decide to purchase or subscribe for any shares, and the expression “Prospectus Regulation” means Regulation (EU) 2017/1129.

Notice to prospective investors in United Kingdom

In the United Kingdom, this prospectus supplement is only being distributed to, and is only directed at, and any investment or investment activity to which this prospectus supplement relates is available only to, and will be engaged in only with, persons who are “qualified investors” (as defined in the Prospectus Regulation) (i) having professional experience in matters relating to investments who fall within the definition of “investment professionals” in Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (the “Order”); or (ii) who are high net worth entities falling within Article 49(2)(a) to (d) of the Order (all such persons together being referred to as “relevant persons”). Persons who are not relevant persons should not take any action on the basis of this prospectus supplement and should not act or rely on it.

Notice to prospective investors in Canada

The shares may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations. Any resale of the shares must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser’s province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser’s province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 Underwriting Conflicts (NI 33-105), the underwriters are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

Notice to prospective investors in Switzerland

The shares may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange ("SIX") or on any other stock exchange or regulated trading facility in Switzerland. This document does not constitute a prospectus within the meaning of, and has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document nor any other offering or marketing material relating to the shares or the offering may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this document nor any other offering or marketing material relating to the offering, the Company, the shares have been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA (FINMA), and the offer of shares has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes ("CISA"). The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares.

Notice to prospective investors in the United Arab Emirates

The shares have not been, and are not being, publicly offered, sold, promoted or advertised in the United Arab Emirates (including the Dubai International Financial Centre) other than in compliance with the laws of the United Arab Emirates (and the Dubai International Financial Centre) governing the issue, offering and sale of securities. Further, this prospectus does not constitute a public offer of securities in the United Arab Emirates (including the Dubai International Financial Centre) and is not intended to be a public offer. This prospectus has not been approved by or filed with the Central Bank of the United Arab Emirates, the Securities and Commodities Authority or the Dubai Financial Services Authority.

Notice to prospective investors in Australia

This prospectus:

- does not constitute a disclosure document or a prospectus under Chapter 6D.2 of the Corporations Act 2001 (Cth) (the "Corporations Act");
- has not been, and will not be, lodged with the Australian Securities and Investments Commission ("ASIC"), as a disclosure document for the purposes of the Corporations Act and does not purport to include the information required of a disclosure document for the purposes of the Corporations Act; and
- may only be provided in Australia to select investors who are able to demonstrate that they fall within one or more of the categories of investors, available under section 708 of the Corporations Act ("Exempt Investors").

The shares may not be directly or indirectly offered for subscription or purchased or sold, and no invitations to subscribe for or buy the shares may be issued, and no draft or definitive offering memorandum, advertisement or other offering material relating to any shares may be distributed in Australia, except where disclosure to investors is not required under Chapter 6D of the Corporations Act or is otherwise in compliance with all applicable Australian laws and regulations. By submitting an application for the shares, you represent and warrant to us that you are an Exempt Investor.

As any offer of shares under this document will be made without disclosure in Australia under Chapter 6D.2 of the Corporations Act, the offer of those securities for resale in Australia within 12 months may, under section 707 of the Corporations Act, require disclosure to investors under Chapter 6D.2 if none of the exemptions in

section 708 applies to that resale. By applying for the shares you undertake to us that you will not, for a period of 12 months from the date of issue of the shares, offer, transfer, assign or otherwise alienate those shares to investors in Australia except in circumstances where disclosure to investors is not required under Chapter 6D.2 of the Corporations Act or where a compliant disclosure document is prepared and lodged with ASIC.

Notice to prospective investors in Japan

The shares have not been and will not be registered pursuant to Article 4, Paragraph 1 of the Financial Instruments and Exchange Act. Accordingly, none of the shares nor any interest therein may be offered or sold, directly or indirectly, in Japan or to, or for the benefit of, any "resident" of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan), or to others for re-offering or resale, directly or indirectly, in Japan or to or for the benefit of a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Act and any other applicable laws, regulations and ministerial guidelines of Japan in effect at the relevant time.

Notice to prospective investors in Hong Kong

The shares have not been offered or sold and will not be offered or sold in Hong Kong, by means of any document, other than (a) to "professional investors" as defined in the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong) (the "SFO") of Hong Kong and any rules made thereunder; or (b) in other circumstances which do not result in the document being a "prospectus" as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32 of the Laws of Hong Kong) (the "CO") or which do not constitute an offer to the public within the meaning of the CO. No advertisement, invitation or document relating to the shares has been or may be issued or has been or may be in the possession of any person for the purposes of issue, whether in Hong Kong or elsewhere, which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to shares which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" as defined in the SFO and any rules made thereunder.

Notice to prospective investors in Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of shares may not be circulated or distributed, nor may the shares be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor (as defined in Section 4A of the Securities and Futures Act (Chapter 289) of Singapore, as modified or amended from time to time (the "SFA")) pursuant to Section 274 of the SFA; (ii) to a relevant person (as defined in Section 275(2) of the SFA) pursuant to Section 275(1) of the SFA, or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions specified in Section 275 of the SFA, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the shares are subscribed or purchased under Section 275 of the SFA by a relevant person which is:

- a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or
- a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor,

securities or securities-based derivatives contract (each term as defined in Section 2(1) of the SFA) of that corporation or the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the shares pursuant to an offer made under Section 275 of the SFA except:

- to an institutional investor or to a relevant person defined in Section 275(2) of the SFA, or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(i)(B) of the SFA;
- where no consideration is or will be given for the transfer;
- where the transfer is by operation of law;
- as specified in Section 276(7) of the SFA; or
- as specified in Regulation 37A of the Securities and Futures (Offers of Investments) (Securities and Securities-based Derivatives Contracts) Regulations 2018.

Singapore SFA Product Classification—Solely for the purposes of its obligations pursuant to sections 309B(1)(a) and 309B(1)(c) of the SFA, the Company has determined, and hereby notifies all relevant persons (as defined in Section 309A of the SFA) that the shares are "prescribed capital markets products" (as defined in the Securities and Futures (Capital Markets Products) Regulations 2018) and Excluded Investment Products (as defined in MAS Notice SFA 04-N12: Notice on the Sale of Investment Products and MAS Notice FAA-N16: Notice on Recommendations on Investment Products).

LEGAL MATTERS

The validity of the shares of common stock offered hereby will be passed upon for us by Latham & Watkins LLP. Certain legal matters will be passed upon for the underwriters by Davis Polk & Wardwell LLP.

EXPERTS

The consolidated financial statements of Atea Pharmaceuticals, Inc. as of December 31, 2019 and 2018, and for the years then ended, have been included herein and in the registration statement in reliance upon the report of KPMG LLP, independent registered public accounting firm, appearing elsewhere herein, and upon the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the Securities and Exchange Commission a registration statement on Form S-1 under the Securities Act with respect to the shares of common stock offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits and schedules filed therewith. For further information about us and the common stock offered hereby, we refer you to the registration statement and the exhibits and schedules filed thereto. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and each such statement is qualified in all respects by reference to the full text of such contract or other document filed as an exhibit to the registration statement. Upon completion of this offering, we will be required to file periodic reports, proxy statements, and other information with the Securities and Exchange Commission pursuant to the Securities Exchange Act of 1934. The Securities and Exchange Commission maintains an Internet website that contains reports, proxy statements and other information about registrants, like us, that file electronically with the Securities and Exchange Commission. The address of that site is *www.sec.gov*.

ATEA PHARMACEUTICALS, INC.
INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Atea Pharmaceuticals, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Atea Pharmaceuticals, Inc. and subsidiary (the Company) as of December 31, 2019 and 2018, the related consolidated statements of operations and comprehensive loss, convertible preferred stock and stockholders' deficit, and cash flows for the years then ended, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for the years then ended, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2014.

Boston, Massachusetts

June 18, 2020

ATEA PHARMACEUTICALS, INC.
Consolidated Balance Sheets
(in thousands, except share and per share amounts)

	December 31,	
	2019	**2018**
Assets		
Current assets		
Cash and cash equivalents	$ 21,661	$ 34,492
Prepaid expenses and other current assets	249	206
Total current assets	21,910	34,698
Property and equipment, net	41	56
Other assets	122	107
Total assets	$ 22,073	$ 34,861
Liabilities, Convertible Preferred Stock and Stockholders' Deficit		
Current liabilities		
Accounts payable	$ 548	$ 391
Accrued expenses and other current liabilities	1,887	1,369
Total current liabilities	2,435	1,760
Other liabilities	95	148
Total liabilities	2,530	1,908
Commitments and contingencies (see Note 6)		
Convertible preferred stock, $0.001 par value; 33,645,447 shares authorized, issued and outstanding as of December 31, 2019 and 2018; liquidation preference of $70,606 as of December 31, 2019	69,114	69,114
Stockholders' deficit:		
Common stock, $0.001 par value; 53,070,161 shares authorized as of December 31, 2019 and 2018; 10,091,100 shares issued and outstanding as of December 31, 2019 and 2018	10	10
Additional paid-in capital	4,632	4,008
Accumulated deficit	(54,213)	(40,179)
Total stockholders' deficit	(49,571)	(36,161)
Total liabilities, convertible preferred stock and stockholders' deficit	$ 22,073	$ 34,861

The accompanying notes are an integral part of these consolidated financial statements.

ATEA PHARMACEUTICALS, INC.
Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except share and per share amounts)

	Year Ended December 31,	
	2019	**2018**
Operating expenses		
Research and development	$ 10,170	$ 6,675
General and administrative	4,438	2,802
Total operating expenses	14,608	9,477
Loss from operations	(14,608)	(9,477)
Interest income and other, net	574	413
Net loss and comprehensive loss	$ (14,034)	$ (9,064)
Net loss per share attributable to common stockholders—basic and diluted	$ (1.39)	$ (0.90)
Weighted-average common shares outstanding—basic and diluted	10,091,100	10,039,392
Pro forma net loss per share attributable to common stockholders—basic and diluted (unaudited)	$ (0.32)	
Pro forma weighted-average common shares outstanding—basic and diluted (unaudited)	43,736,547	

The accompanying notes are an integral part of these consolidated financial statements.

ATEA PHARMACEUTICALS, INC.
Consolidated Statements of Convertible Preferred Stock and Stockholders' Deficit
(in thousands, except share amounts)

	Convertible Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Deficit
	Shares	Amount	Shares	Amount			
Balance—January 1, 2018	27,592,830	$ 41,755	9,987,767	$ 10	$ 3,594	$ (31,115)	$ (27,511)
Issuance of Series C convertible preferred stock, net of issuance costs of $241	6,052,617	27,359	—	—	—	—	—
Vesting of restricted common stock	—	—	103,333	—	—	—	—
Stock-based compensation expense	—	—	—	—	414	—	414
Net loss	—	—	—	—	—	(9,064)	(9,064)
Balance—December 31, 2018	33,645,447	69,114	10,091,100	10	4,008	(40,179)	(36,161)
Stock-based compensation expense	—	—	—	—	624	—	624
Net loss	—	—	—	—	—	(14,034)	(14,034)
Balance—December 31, 2019	33,645,447	$ 69,114	10,091,100	$ 10	$ 4,632	$ (54,213)	$ (49,571)

The accompanying notes are an integral part of these consolidated financial statements.

ATEA PHARMACEUTICALS, INC.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,	
	2019	**2018**
Cash flows from operating activities		
Net loss	$ (14,034)	$ (9,064)
Adjustments to reconcile net loss to net cash used in operating activities		
Stock-based compensation expense	624	414
Depreciation and amortization expense	17	17
Changes in operating assets and liabilities		
Prepaid expenses and other current assets	(43)	86
Accounts payable	157	(90)
Accrued expenses and other liabilities	465	729
Net cash used in operating activities	(12,814)	(7,908)
Cash flows from investing activities		
Additions to property and equipment	(2)	(12)
Net cash used in investing activities	(2)	(12)
Cash flows from financing activities		
Proceeds from issuance of convertible preferred stock, net of issuance costs	—	27,359
Proceeds from grant of restricted common stock award	—	124
Payments made for initial public offering costs	(15)	—
Net cash provided by (used in) financing activities	(15)	27,483
Net increase (decrease) in cash, cash equivalents and restricted cash	(12,831)	19,563
Cash, cash equivalents and restricted cash at the beginning of period	34,599	15,036
Cash, cash equivalents and restricted cash at the end of period	$ 21,768	$34,599
Cash, cash equivalents and restricted cash at the end of period		
Cash and cash equivalents	$ 21,661	$34,492
Restricted cash	107	107
Total cash, cash equivalents and restricted cash	$ 21,768	$34,599

The accompanying notes are an integral part of these consolidated financial statements.

ATEA PHARMACEUTICALS, INC.
Notes to Consolidated Financial Statements
(in thousands, except share and per share amounts.)

1. Nature of Organization

Organization

Atea Pharmaceuticals, Inc. (together with its subsidiary, “Atea” or “the Company”), is a biopharmaceutical company that was incorporated in July 2012 and began principal operations in March 2014. The Company is using a chemistry driven approach and its drug discovery and development capabilities to identify and develop novel antiviral therapeutics. The Company is located in Boston, Massachusetts. Atea Pharmaceuticals Securities Corporation, or Atea PSC, a Massachusetts corporation incorporated in 2016, is a wholly owned subsidiary of Atea.

Risks and Uncertainties

The Company is subject to risks and uncertainties common to clinical stage biopharmaceutical companies. These risks include, but are not limited to, potential failure of preclinical and clinical studies, uncertainties associated with research and development activities generally, competition from technical innovations of others, dependence upon key personnel, compliance with governmental regulations, the need to obtain marketing approval for any product candidate that the Company may discover and develop, the need to gain broad acceptance among patients, payers and health care providers to successfully commercialize any product for which marketing approval is obtained and the need to secure and maintain adequate intellectual property protection for the Company’s proprietary technology and products. Further, the Company is currently dependent on third-party service providers for much of its preclinical research, clinical development and manufacturing activities. Product candidates currently under development will require significant amounts of additional capital, additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval, prior to commercialization. Even if the Company is able to generate revenues from the sale of its product candidates, if approved, it may not become profitable. If the Company fails to become profitable or is unable to sustain profitability on a continuing basis, then it may be unable to continue its operations at planned levels and be forced to reduce its operations. The Company is also subject to risks associated with the COVID-19 global pandemic, including actual and potential delays associated with our ongoing and anticipated trials, and potential negative impacts on the Company’s business operations and its ability to raise additional capital to finance its operations.

The Company has financed its operations to date from the sale of convertible preferred stock. Since its inception, the Company has incurred recurring operating losses and negative cash flows from operations. As of December 31, 2019, the Company had an accumulated deficit of $54,213. The Company expects to continue to generate operating losses for the foreseeable future. As discussed in Note 13, in May 2020, the Company entered into a stock purchase agreement and issued 15,313,382 shares of Series D convertible preferred stock (“Series D Preferred”) for gross proceeds of $107,500. Management believes its existing cash resources, including $107,500 received in May 2020, will be sufficient to fund its operations as currently planned for at least twelve months following the issuance of these financial statements.

The Company is seeking to complete an initial public offering, or IPO, of its common stock. In the event that the Company does not complete an IPO, the Company may seek additional capital through one or more of a combination of private financing through the sale of additional equity securities, debt financing or funding in connection with any collaborative relationships it may enter into or other arrangements. There can be no assurance that the Company will be able to obtain such additional funding, on terms acceptable to the Company, on a timely basis or at all. The terms of any financing may adversely affect the holdings or the rights of the Company’s existing shareholders.

2. Summary of Significant Accounting Policies

Basis of Presentation and Use of Estimates

The accompanying consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America, or GAAP.

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and in these accompanying notes. The Company bases its estimates on historical experience, known trends and other market-specific or other relevant factors and assumptions that it believes to be reasonable under the circumstances. On an ongoing basis, management evaluates its estimates, which include but are not limited to estimates of accrued research and development expenses and the valuation of common stock in connection with the issuance of stock-based awards. Changes in estimates are recorded in the period in which they become known.

Principles of Consolidation

The consolidated financial statements include the accounts of the Company and Atea PSC. All intercompany amounts have been eliminated in consolidation.

Cash and Cash Equivalents

The Company considers all highly liquid investments purchased with maturities of 90 days or less at acquisition to be cash equivalents. Cash and cash equivalents include bank demand deposits and money market funds that invest in U.S. government and U.S. government agency obligations. Cash equivalents are reported at fair value.

Concentrations of Credit Risk and Significant Suppliers

Financial instruments that potentially subject the Company to concentrations of credit risk are primarily cash and cash equivalents. The Company maintains its cash and cash equivalents with a financial institution that management believes is creditworthy. The Company's investment policy includes guidelines on the quality of the financial institutions and financial instruments and defines allowable investments that the Company believes minimizes the exposure to concentration of credit risk.

The Company is dependent on third-party manufacturers to supply products for research and development activities in its programs. In particular, the Company relies and expects to continue to rely on a small number of manufacturers to supply it with its requirements for the active pharmaceutical ingredients and formulated drugs related to these programs. These programs could be adversely affected by a significant interruption in the supply of active pharmaceutical ingredients and formulated drugs.

Fair Value Measurement

Assets and liabilities recorded at fair value on a recurring basis in the balance sheets are categorized based upon the level of judgment associated with the inputs used to measure their fair values. Fair value is defined as the exchange price that would be received for an asset or an exit price that would be paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The authoritative guidance on fair value measurements establishes a three-tier fair value hierarchy for disclosure of fair value measurements as follows:

Level 1—Observable inputs such as unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date.

Level 2—Observable inputs (other than quoted prices included in Level 1) that are either directly or indirectly observable for the asset or liability. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.

Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to determination of fair value of the assets or liabilities.

Cash, cash equivalents and restricted cash are Level 1 assets which are comprised of funds held in checking and money market accounts. Cash, cash equivalents and restricted cash were recorded at fair value as disclosed in Note 3. The carrying amounts of accounts payable and accrued expenses approximate their fair values due to their short-term maturities.

Property and Equipment

Property and equipment are stated at cost, less accumulated depreciation and amortization. Property and equipment are depreciated using the straight-line method over the estimated useful lives of the asset. The Company estimates the useful life of its assets as follows:

Asset	Estimated useful life
Laboratory equipment	Five years
Office furniture and fixtures	Five years
Computer hardware	Two years
Leasehold improvements	Shorter of useful life or remaining lease term

Maintenance and repairs that do not improve or extend the life of the respective asset are expensed to operations as incurred. Upon disposal of an asset, the related cost and accumulated depreciation are removed from the accounts and any resulting gain or loss is included in the results of operations.

Other Assets

Other assets consists primarily of bank deposits of $107, classified as restricted cash, to collateralize a letter of credit.

Impairment of Long-lived Assets

The Company reviews long-lived assets when events or changes in circumstances indicate the carrying value of the assets may not be recoverable. Recoverability is measured by comparing the book value of the assets to the estimated undiscounted future net cash flows that the asset is expected to generate. If the estimated undiscounted future net cash flows are less than the book value, the asset is impaired, and the impairment loss to be recognized in income is measured as the amount by which the book value of the asset exceeds its fair value, which is measured based on the estimated discounted future net cash flows that the asset is expected to generate. No impairment losses were recorded during the years ended December 31, 2019 and 2018.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development expenses consist principally of costs associated with outsourced research and development activities, including preclinical and clinical development, manufacturing and research conducted by contract research organizations and academic institutions, employee compensation and consulting expenses together with related expenses, professional fees and facility and overhead costs. Facility and overhead costs primarily include the allocation of rent, utility and office-related expenses attributable to research and development personnel. In circumstances where amounts

have been paid in advance or in excess of costs incurred, the Company records a prepaid expense, which is expensed as services are performed or goods are delivered.

The Company has entered into various research and development contracts with third parties. These agreements are generally cancelable, and related payments are recorded as research and development expenses as incurred. The Company records accruals for estimated ongoing research costs. When evaluating the adequacy of the accrued liabilities, the Company analyzes progress of the studies, including the phase of completion of events, invoices received and contracted costs. Significant judgments and estimates are made in determining the accrued balances at the end of any reporting period. Actual results could differ from the Company's estimates. The Company's historical accrual estimates have not been materially different from the actual costs.

Patent Costs

Costs to secure and maintain the Company's patents are expensed as incurred and are classified as general and administrative expenses in the Company's consolidated statements of operations.

Stock-based Compensation

Stock-based compensation expense is classified in the consolidated statement of operations in the same manner in which the award recipient's payroll costs are classified or in which the award recipients' service payments are classified. Stock-based awards granted to employees and non-employees are measured based on the estimated fair value of the awards using the Black-Scholes option pricing model, or Black-Scholes. Stock-based compensation expense with respect to awards with service conditions is recognized using the straight-line method over the service period. Stock-based compensation with respect to awards with performance conditions is recognized when satisfaction of the performance conditions is probable. Stock-based compensation is based on awards ultimately expected to vest and, as such, it is reduced by forfeitures. The Company accounts for forfeitures as they occur.

Black-Scholes requires the use of subjective assumptions which determine the fair value of stock-based awards. These assumptions include:

Fair value of common stock—Historically, because there has been no public market for the Company's common stock, the fair value of the Company's common stock underlying stock-based awards was estimated on each grant date by the board of directors.

Risk-free interest rate—The risk-free interest rate is based on the U.S. Treasury zero coupon issues in effect at the time of grant for periods corresponding with the expected term of a stock-based award.

Expected term—The expected term represents the period that stock-based awards are expected to be outstanding. Given the Company's lack of specific history, the expected term for option grants is determined using the simplified method. The simplified method deems the term to be the average of the time-to-vesting and the contractual life of the stock-based awards.

Expected volatility—Since the Company is privately held and does not have any trading history for its common stock, the expected volatility is estimated based on the average volatility for comparable publicly traded biotechnology companies over a period equal to the expected term of the stock-based awards. The comparable companies were chosen based on their similar size, stage in the life cycle or area of specialty. The Company will continue to apply this process until a sufficient amount of historical information regarding the volatility of its own stock price becomes available.

Expected dividend yield —The Company has never paid dividends on its common stock and has no plans to pay dividends on its common stock. Therefore, the Company used an expected dividend yield of zero.

Income Taxes

The Company uses the asset and liability method of accounting for income taxes. Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax base. Deferred tax assets, which relate primarily to the carrying amount of the Company's net operating loss carryforwards, are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. Deferred tax expense or benefit is the result of changes in the deferred tax assets and liabilities. Valuation allowances are established to reduce deferred tax assets where, based upon the available evidence, the Company concludes that it is more-likely-than-not that the deferred tax assets will not be realized. In evaluating its ability to recover deferred tax assets, the Company considers all available positive and negative evidence, including its operating results, ongoing tax planning and forecasts of future taxable income.

Reserves are provided for tax benefits for which realization is uncertain. Such benefits are only recognized when the underlying tax position is considered more-likely-than-not to be sustained on examination by a taxing authority. Interest and penalties related to uncertain tax positions are recognized in the provision of income taxes.

Comprehensive Loss

Comprehensive income (loss) includes net income (loss) as well as other changes in stockholder equity (deficit) that result from transactions and economic events other than those with equity holders. The Company did not have any items of comprehensive income or loss other than net loss for the years ended December 31, 2019 and 2018.

Net Loss Per Share Attributable to Common Stockholders

The Company calculates basic and diluted net loss per share attributable to common stockholders in conformity with the two-class method required for participating securities. The Company considers its convertible preferred stock to be participating securities as, in the event a dividend is paid on common stock, the holders of convertible preferred stock would be entitled to receive dividends on a basis consistent with the common stockholders. Under the two-class method, the net loss attributable to common stockholders is not allocated to the convertible preferred stock as the holders of the convertible preferred stock do not have a contractual obligation to share in losses.

Since inception, the Company has incurred recurring operating losses and, as such, under the two-class method, basic net loss per share attributable to common stockholders is computed by dividing the net loss attributable to common stockholders by the weighted average number of shares of common stock. Under the two-class method, for periods with net income, basic net income per common share is computed by dividing the net income attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period. Net income attributable to common stockholders is computed by subtracting from net income the portion of current year earnings that the participating securities would have been entitled to receive pursuant to their dividend rights had all of the year's earnings been distributed. No such adjustment to earnings is made during periods with a net loss, as the holders of the participating securities have no obligation to fund losses. Diluted net loss per common share is computed by using the weighted-average number of shares of common stock outstanding. Due to net losses for the year ended December 31, 2019 and 2018, basic and diluted net loss per share attributable to common stockholders were the same, as the effect of all potentially dilutive securities would have been anti-dilutive.

Unaudited Pro Forma Information

Upon closing of a qualified public offering, all of the Company's outstanding shares of convertible preferred stock will automatically convert into shares of common stock. The unaudited pro forma basic and diluted net loss per share were computed using the weighted average number of common shares outstanding after giving effect to the conversion of all the convertible preferred stock into shares of common stock as if such conversion had occurred at the beginning of the period presented or the date of original issuance, if later.

Segments

Operating segments are defined as components of an entity for which separate financial information is available and that is regularly reviewed by the chief operating decision maker, or CODM, in deciding how to allocate resources to an individual segment and in assessing performance. The Company's CODM is its chief executive officer, who manages and allocates resources to the operations on a total company basis. Accordingly, there is a single operating segment and one reportable segment.

Emerging Growth Company Status

The Company is an emerging growth company, as defined in the Jumpstart Our Business Startups Act of 2012, or JOBS Act. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act, until such time as those standards apply to private companies. The Company has elected to use this extended transition period for complying with new or revised accounting standards that have different effective dates for public and private companies until the earlier of the date that it (i) is no longer an emerging growth company or (ii) affirmatively and irrevocably opts out of the extended transition period provided in the JOBS Act. As a result, these consolidated financial statements may not be comparable to companies that comply with the new or revised accounting pronouncements as of public company effective dates.

Recently Issued Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board ("FASB") issued ASU No. 2016-02, *Leases*, which requires a lessee to record a right-of-use asset and a corresponding lease liability on the balance sheet for all leases with terms longer than 12 months. A modified retrospective transition approach is required for lessees for capital and operating leases existing at, or entered into after, the beginning of the earliest comparative period presented in the financial statements, with certain practical expedients available. As the Company has elected to use the extended transition period for complying with new or revised accounting standards as available under the Jobs Act, the standard is effective for the Company beginning January 1, 2021, with early adoption permitted. The Company is currently evaluating the expected impact that the standard could have on its consolidated financial statements and related disclosures.

In July 2017, the FASB issued ASU No. 2017-11, *Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480), Derivatives and Hedging (Topic 815) I. Accounting for Certain Financial Instruments with Down Round Features II. Replacement of the Indefinite Deferral for Mandatorily Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatorily Redeemable Noncontrolling Interests with a Scope Exception ("ASU 2017-11").* Part I applies to entities that issue financial instruments such as warrants, convertible debt or convertible preferred stock that contain down-round features. Part II replaces the indefinite deferral for certain mandatorily redeemable noncontrolling interests and mandatorily redeemable financial instruments of nonpublic entities contained within ASC Topic 480 with a scope exception and does not impact the accounting for these mandatorily redeemable instruments. As the Company has elected to use the extended transition period for complying with new or revised accounting standards as available under the Jobs Act, the standard is effective for the Company beginning January 1, 2021, with early adoption permitted. The Company is currently evaluating the expected impact that the standard could have on its consolidated financial statements and related disclosures.

Recently Adopted Accounting Pronouncements

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers* (Topic 606) ("ASU 2014-09"), which supersedes existing revenue recognition guidance under GAAP. The standard's core principle is that a company will recognize revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. The standard defines a five-step process to achieve this principle and will require companies to use more judgment and make more estimates than under the current guidance. The Company expects that these judgments and estimates will include identifying performance obligations in the customer contract, estimating the amount of variable consideration to include in the transaction price and allocating the transaction price to each separate performance obligation. ASU 2014-09 also requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts. In August 2015, the FASB issued ASU No. 2015-14, Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date, which delays the effective date of ASU 2014-09 such that the standard is effective for annual periods beginning after December 15, 2018. The FASB subsequently issued amendments to ASU 2014-09 that have the same effective date and transition date. The Company adopted ASU 2014-09 as of January 1, 2019 and the adoption did not have an impact on the Company's consolidated financial statements as the Company does not currently have any revenue-generating arrangements.

In August 2018, the FASB issued ASU 2018-13, *Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurements,* which changes the fair value measurement disclosure requirements of ASC 820. The goal of the ASU is to improve the effectiveness of ASC 820's disclosure requirements. The standard is applicable to the Company for fiscal years beginning January 1, 2020 and interim periods within those years. The Company elected to early adopt this guidance effective January 1, 2019. The adoption of this guidance did not have an effect the Company's consolidated financial statements.

3. Fair Value Measurements

The following tables present information about the Company's financial assets measured at fair value on a recurring basis and indicate the level of the fair value hierarchy utilized to determine such fair values:

	Fair Value Measurements as of December 31, 2019			
	Level 1	**Level 2**	**Level 3**	**Total**
Cash equivalents				
Money market funds	$21,038	$ —	$ —	$21,038
Total cash equivalents	$21,038	$ —	$ —	$21,038

	Fair Value Measurements as of December 31, 2018			
	Level 1	**Level 2**	**Level 3**	**Total**
Cash equivalents				
Money market funds	$33,398	$ —	$ —	$33,398
Total cash equivalents	$33,398	$ —	$ —	$33,398

The Company's assets with fair value categorized as Level 1 within the fair value hierarchy include money market funds. Money market funds are publicly traded mutual funds and are presented as cash equivalents on the consolidated balance sheets as of December 31, 2019 and 2018.

There were no transfers among Level 1, Level 2 or Level 3 categories in the years ended December 31, 2019 and 2018.

4. Property and Equipment, net

Property and equipment, net, consist of the following:

	December 31,	
	2019	2018
Laboratory equipment	$ 5	$ 5
Office furniture and fixtures	13	13
Computer hardware	11	9
Leasehold improvements	125	125
Total property and equipment, at cost	154	152
Less: accumulated depreciation and amortization	(113)	(96)
Property and equipment, net	$ 41	$ 56

Depreciation and amortization expense was $17 for each of the years ended December 31, 2019 and 2018.

5. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consist of the following:

	December 31,	
	2019	2018
Research and development	$1,326	$1,026
License fees (Note 6)	200	200
Professional fees and other	361	143
Total accrued expenses and other current liabilities	$1,887	$1,369

6. Commitments and Contingencies

Operating Lease Agreements

The Company leases an office facility under a non-cancelable operating lease that expires July 2022. The office lease includes commitments obligating the Company to pay a pro rata share of certain building operating costs and annual rent escalations which will result in higher lease payments in future years. Rent expense is recognized on a straight-line basis over the term of the lease with the difference between expense and the payments recorded as deferred rent, which is included in accrued expenses and other current liabilities and other liabilities.

As of December 31, 2019, future minimum payments for operating leases are as follows:

2020	$335
2021	340
2022	200
Total future minimum lease payments	$875

Rent expense recognized under all operating leases was $305 and $316 for the years ended December 31, 2019 and 2018, respectively.

The Company is required to maintain a letter of credit for the duration of the office lease. The Company maintains bank deposits of $107 to collateralize the letter of credit which are classified as restricted cash and a long-term asset in the consolidated balance sheet as of December 31, 2019.

License Agreement with NovaMedica LLC

In May 2014, the Company entered into an exclusive license agreement with NovaMedica LLC, an affiliated entity of a stockholder, pursuant to which the Company granted NovaMedica a license to certain intellectual property rights for commercialization of a potential product for the treatment of hepatitis C. In connection with the license, the Company received a license fee of $200 in partial consideration for the grant of the license. Recognition of the license fee has been deferred and recorded in other liabilities until both the Company and NovaMedica finalize certain other terms and conditions of the license agreement at which time the technology access fee will be evaluated, along with the license agreement broadly, for revenue recognition.

If the Company and NovaMedica failed to agree on the terms of an amendment to the license agreement covering certain payment terms, and the license agreement was thereafter terminated, such termination was to be subject to a payment by the Company of a termination fee of $400. As discussed in Note 13, this agreement was terminated in May 2020, and the Company paid a termination fee of $400.

Business Development Consulting Agreement

The Company is a party to a consulting agreement that provides for the payment by the Company of consideration, consisting of cash, up to a maximum of $1,750, and the vesting of equity awards, if a business development transaction that meets or exceeds certain thresholds is successfully concluded on or before December 31, 2020 (Note 9). As of December 31, 2019, the performance conditions were not yet probable of being met and, as a result, no expense has yet to be recognized in connection with the consulting agreement in the consolidated statement of operations.

Indemnification

The Company enters into certain types of contracts that contingently requires the Company to indemnify various parties against claims from third parties. These contracts primarily relate to (i) the Company's bylaws, under which the Company must indemnify directors and executive officers, and may indemnify other officers and employees, for liabilities arising out of their relationship, (ii) contracts under which the Company must indemnify directors and certain officers and consultants for liabilities arising out of their relationship, and (iii) procurement, service or license agreements under which the Company may be required to indemnify vendors, service providers or licensees for certain claims, including claims that may be brought against them arising from the Company's acts or omissions with respect to the Company's products, technology, intellectual property or services.

From time to time, the Company may receive indemnification claims under these contracts in the normal course of business. In the event that one or more of these matters were to result in a claim against the Company, an adverse outcome, including a judgment or settlement, may cause a material adverse effect on the Company's future business, operating results or financial condition. It is not possible to determine the maximum potential amount potentially payable under these contracts since the Company has no history of prior indemnification claims and the unique facts and circumstances involved in each particular claim will be determinative.

7. Convertible Preferred Stock

As of December 31, 2019, the Company had 33,645,447 shares of convertible preferred stock, or Convertible Preferred Stock, authorized, of which 20,000,000 shares are designated as Series A convertible preferred

stock, or Series A Preferred; 7,592,830 shares are designated as Series B convertible preferred stock, or Series B Preferred; and 6,052,617 shares are designated as Series C convertible preferred stock, or Series C Preferred. The Company's Series A Preferred, Series B Preferred and Series C Preferred were issued at $1.00, $3.03 and $4.56 per share, respectively. The following table summarizes the Company's outstanding Convertible Preferred Stock:

	December 31, 2019 and 2018				
	Preferred Stock Authorized	Preferred Stock Issued and Outstanding	Carrying Value	Liquidation Preference	Common Stock Issuable Upon Conversion
Series A Preferred	20,000,000	20,000,000	$ 19,136	$ 20,000	20,000,000
Series B Preferred	7,592,830	7,592,830	22,619	23,006	7,592,830
Series C Preferred	6,052,617	6,052,617	27,359	27,600	6,052,617
	33,645,447	33,645,447	$ 69,114	$ 70,606	33,645,447

The Company classifies Convertible Preferred Stock outside of stockholders' deficit because the shares contain deemed liquidation rights in the event of a merger, consolidation, or reorganization involving the Company or a subsidiary or upon the sale, lease, transfer, exclusive license or other disposition by the Company or a subsidiary of all or substantially all assets of the Company that could trigger a distribution of cash or assets and therefore a contingent redemption feature not solely within the Company's control.

The rights and preferences of Convertible Preferred Stock are described below:

Voting

Holders of the Convertible Preferred Stock preferred stock are entitled to vote, together with the holders of common stock, on all matters as to which holders of common stock are entitled to vote, except with respect to matters which Delaware General Corporation Law, or DGCL, or the certificate of incorporation requires that a vote by separate class. Each holder of Convertible Preferred Stock is entitled to one vote for each share of common stock into which the Convertible Preferred Stock is convertible at the time of such vote.

Certain actions specified in the certificate of incorporation require the affirmative vote of Requisite Preferred Holders, which are the holders of a majority of the Series B Preferred and Series C Preferred voting together as a single class, while other actions require: (i) the affirmative vote of holders of least 57% of Series C Preferred voting as a separate class; (ii) the affirmative vote of holders of at least 67% of the Series B Preferred voting as a separate class; or (iii) the affirmative vote of holders of a majority of the outstanding Convertible Preferred Stock voting as a single class.

At any time when an aggregate of 6,000,000 shares of Series B Preferred and Series C Preferred are outstanding, the affirmative vote of the Requisite Preferred Holders is required to (i) purchase, redeem or pay or declare any dividend or make any distribution on any class of stock other than certain specified transactions; or (ii) create or authorize the creation of any class or series of capital stock unless the new class ranks junior to the Series C Preferred and Series B Preferred.

At any time when at least 3,800,000 shares of Series B Preferred are outstanding, the affirmative vote of the holders of at least 67% of the Series B Preferred is required to: (i) amend, alter or repeal the certificate of incorporation or bylaws in any way that adversely affects the powers, preferences or rights of the holders of Series B Preferred; (ii) increase or decrease the authorized number of shares of Series B Preferred; and (iii) approve any liquidation event in which a holder of Series B Preferred would receive less than $3.03 per share in connection with such event.

At any time when at least 2,200,000 shares of Series C Preferred are outstanding, the affirmative vote of the holders of at least 57% of the Series C Preferred is required to: (i) amend, alter or repeal the certificate of incorporation or bylaws in any way that adversely affects the powers, preferences or rights of the holders of Series C preferred; (ii) purchase, redeem or pay or declare any dividend or make any distribution on any class of stock other than certain specified transactions; (iii) increase or decrease the authorized number of shares of Series C Preferred; and (iv) approve any liquidation event in which a holder of Series C Preferred would receive less than $4.56 per share in connection with such event.

As long as at least 11,000,000 shares of Convertible Preferred Stock are outstanding, the affirmative vote of the holders of a majority of the outstanding Convertible Preferred Stock, voting as a single class, is required to affect any liquidation, dissolution, or winding up of the business and affairs of the Company.

The holders of Series A Preferred, Series B Preferred and the Series C Preferred, voting respectively as separate classes, each have the right to elect a director to the board of directors. The right to elect such a director shall continue for holders of Series A Preferred for so long as 5,000,000 shares of Series A Preferred are outstanding, for holders of Series B Preferred for so long as 5,000,000 shares of Series B Preferred are outstanding and for holders of Series C Preferred for so long as 2,741,228 shares of Series C Preferred are outstanding. The remainder of the board of directors, excluding one director that may be elected by holders of common stock voting as a separate class, is elected by the holders of the Convertible Preferred Stock voting together with holders of the common stock as a single class and otherwise in accordance with the stockholders' agreement.

Dividends

Holders of shares of Convertible Preferred Stock are entitled to dividends only if, when and as declared by the board of directors. The Company is prohibited from declaring, paying or setting aside any dividends unless the holders of the then outstanding Convertible Preferred Stock receive first, or simultaneously, in the case of a dividend on common stock, on a *pari passu* basis, a dividend in an amount that is at least equal to the amount that would have been received by the holders of the Convertible Preferred Stock had all the Convertible Preferred Stock been converted to common stock. As of December 31, 2019, no dividends have been declared or paid on the Convertible Preferred Stock.

Liquidation Preference

In the event of any liquidation, dissolution, winding up of the affairs or deemed liquidation event of the Company, the holders of Series C Preferred are entitled to receive in preference to the holders of Series A Preferred and Series B Preferred and the common stock, an amount equal to the greater of (1) the original purchase price of the Series C Preferred plus all declared but unpaid dividends, or (2) such amount per share of Series C Preferred payable as if converted into common stock. After the preferential payment to holders of the Series C Preferred, the holders of Series A Preferred and Series B Preferred, on a *pari passu* basis and prior and in preference to the holders of common stock, are entitled to receive an amount equal to the greater of (1) the original purchase price of the applicable series of preferred stock plus all declared but unpaid dividends, or (2) such amount per share of preferred stock payable as if converted into common stock. After the preferential distributions are made to the holders of Convertible Preferred Stock, any remaining assets of the Company will be distributed ratably among the holders of common stock. If the assets or surplus funds to be distributed to the holders of the Convertible Preferred are insufficient to permit the payment to such holders of their full preferential amount, the assets and surplus funds legally available for distribution will be distributed in preferential order, first to the holders of Series C Preferred and next to the holders of Series A Preferred and Series B Preferred, in each instance, ratably in proportion to the respective amount that would have been paid if all amounts payable on or with respect to such shares had been paid in full.

In the event of a deemed liquidation event, holders of Convertible Preferred Stock may require the Company to redeem their shares at a price equal to the liquidation amount.

Conversion

Each share of Convertible Preferred Stock is convertible into common stock on a one-for-one basis. Conversion is at the option of the holder of the Convertible Preferred Stock except upon either the closing of a firm commitment underwritten public offering in which shares of common stock are sold at a price of at least $5.48 per share (subject to appropriate adjustment for stock splits, stock dividends, combinations and other similar recapitalizations affecting the number of such shares issued and outstanding) resulting in gross proceeds of at least $50 million, or upon the written election of the Requisite Preferred Holders in which event conversion of Series A Preferred and Series B Preferred is automatic and Series C Preferred will convert provided that holders of at least 57% of then outstanding Series C Preferred consent to such conversion. The conversion price of each of the Series C Preferred, Series B Preferred and Series A Preferred at December 31, 2019 is equal to the respective original issue price of each series.

The conversion price is subject to adjustment in accordance with provisions in the certificate of incorporation. Specifically, the holders of Convertible Preferred Stock are entitled to weighted average anti-dilution protection in the event that the Company issues additional securities at a purchase price less than the then effective conversion price.

Registration Rights

The holders of the Convertible Preferred Stock may require the Company in certain circumstances to register for sale the shares of common stock issuable upon conversion of the Convertible Preferred Stock. Such registration would permit the sale of the underlying common stock under the Securities Act of 1933, as amended.

Participation Rights in Future Equity Issuances

All holders of Convertible Preferred Stock have a pro rata right, based on their percentage equity ownership in the Company, to participate, subject only to certain limited exceptions, in subsequent issuances of equity securities of the Company. In addition, should any such holder choose not to purchase its full pro rata share, the remaining holders of Convertible Preferred Stock have the right to purchase the remaining pro rata shares.

Redemption rights

Convertible Preferred Stock has no stated redemption features. However, the Convertible Preferred Stock does contain deemed liquidation rights in the event of a merger, consolidation, or reorganization involving the Company or a subsidiary or on the sale, lease, transfer, exclusive license or other disposition by the Company or a subsidiary of all or substantially all assets of the Company that could trigger a distribution of cash or assets not solely within the Company’s control.

8. Common Stock

At December 31, 2019, the authorized capital of the Company included 53,070,161 shares of common stock, of which 10,091,100 shares of common stock were considered issued and outstanding for accounting purposes. As discussed in Note 9, restricted stock awards for an aggregate 200,000 shares are excluded from issued and outstanding shares for accounting purposes. On all matters to be voted upon by the holders of common stock, holders of common stock are entitled to one vote per share. Subject to the rights and preferences applicable to the outstanding shares of Convertible Preferred Stock, the holders of common stock are entitled to receive dividends, when declared by the board, and to share ratably in the Company’s assets legally available for

distribution to the holders of the Company's stock in the event of liquidation. The holders of common stock have no preemptive, redemption or conversion rights.

The Company had the following reserved shares of common stock:

	December 31, 2019
Series A Preferred	20,000,000
Series B Preferred	7,592,830
Series C Preferred	6,052,617
Outstanding options	3,911,633
Options available for future grant	450,567
	38,007,647

9. Stock-based Compensation

As of December 31, 2019, the Atea Pharmaceuticals 2013 Equity Incentive Plan, as amended, or 2013 Plan, provides for the grant of incentive stock options, non-qualified stock options, restricted common stock awards and other awards for up to 7,807,200 shares of common stock to employees, officers, directors and consultants of the Company.

As of December 31, 2019, options to purchase 3,986,633 shares of common stock and 3,370,000 shares of restricted common stock have been granted under the 2013 Plan, and there were 450,567 shares of common stock remaining available for future issuance.

Restricted Common Stock

Restricted stock awards generally include vesting and risk of forfeiture provisions that lapse upon satisfaction of performance conditions or over time periods commencing on the grant date and concluding on the third or fourth anniversary of the grant date.

The Company has granted awards totaling 200,000 shares of restricted common stock to a consultant pursuant to the 2013 Plan for consulting and business development services. The consultant paid $1.21 per share and an aggregate of $121 for 100,000 of the shares of restricted common stock in 2016 and $1.24 per share and an aggregate of $124 for 100,000 of the shares of restricted common stock in 2018. These awards of restricted common stock will vest, and the risk of forfeiture will lapse upon satisfaction of performance conditions detailed in each award. As of December 31, 2019, the performance conditions were not yet probable of being met and, as a result, no compensation expense has yet been recognized for these performance-based awards. The unvested and forfeitable common stock as of December 31, 2019 and 2018, though legally issued, are excluded from issued and outstanding shares for accounting purposes. Amounts received for the unvested and forfeitable common stock totaling $245 are included in additional paid-in capital within stockholders' deficit in the consolidated balance sheets. At December 31, 2019, total unrecognized compensation expense related to unvested restricted common stock was $370.

Stock Options

The following summarizes stock option activity:

	Number of Shares	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Outstanding at January 1, 2019	2,820,000	$ 1.40	8.9	$ 2,059
Granted	1,091,633	$ 1.78		
Outstanding at December 31, 2019	3,911,633	$ 1.50	8.5	$ 3,915
Options exercisable at December 31, 2019	1,967,824	$ 1.37	7.7	$ 2,252
Vested or expected to vest at December 31, 2019	3,911,633	$ 1.50	8.5	$ 3,915

The aggregate intrinsic value of options granted is calculated as the difference between the exercise price of the options and the estimated fair value of the Company's common stock for those options that had exercise prices lower than the fair value of the Company's common stock.

Option grants generally vest over a service period of three or four years and have a contractual term of ten years. There were no options exercised, forfeited or expired during the years ended December 31, 2019 and 2018. As of December 31, 2019, total unrecognized compensation expense related to stock option awards was $1,927, which amount is being recognized over a remaining weighted average period of 2.5 years.

The weighted average grant date fair value per option granted to employees during the years ended December 31, 2019 and 2018 was $1.19 and $0.774, respectively. The fair value of each award was estimated using Black-Scholes based on the following assumptions:

	For the Year Ended December 31,	
	2019	2018
Risk-free interest rate	1.61 - 2.02%	2.45 - 2.89%
Expected term	5.52 - 10.0 years	5.52 - 9.96 years
Expected volatility	49.2% - 78.0%	49.2%
Expected dividend yield	0%	0%

Stock-based Compensation Expense

Stock-based compensation expense is classified as follows:

	For the Year Ended December 31,	
	2019	2018
Research and development expense	$ 255	$ 192
General and administrative	369	222
Total stock-based compensation expense	$ 624	$ 414

The components of stock-based compensation expense were:

	For the Year Ended December 31,	
	2019	2018
Restricted common stock	$ —	$ 5
Stock options	624	409
Total stock-based compensation expense	$ 624	$ 414

10. Income Taxes

During the years ended December 31, 2019 and 2018, the Company did not record a current or deferred income tax expense or benefit.

The reconciliation of federal statutory income tax rate to the Company's effective income tax rate is as follows:

	For the Year Ended December 31,	
	2019	2018
Federal statutory income tax rate	21.0%	21.0%
State taxes	6.2	4.0
Research and development credits	0.9	1.1
Other	(0.5)	0.3
Change in valuation allowance	(27.6)	(26.4)
Total	0.0%	0.0%

Deferred income taxes reflect the net effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. The principal components of the Company's deferred tax assets consisted of the following:

	December 31,	
	2019	2018
Deferred tax assets		
Net operating loss carryforwards	$ 13,466	$ 9,617
Stock-based compensation	1,024	918
Research and development credits	455	335
Other	152	352
Gross deferred tax assets	15,097	11,222
Less: valuation allowance	(15,097)	(11,222)
Net deferred tax assets	$ —	$ —

As of December 31, 2019, the Company had federal net operating losses of $49,309 and state net operating loss carryforwards of $49,219. The Company also has federal and state research and development tax credit carryforwards of $348 and $136, respectively, which may be used to offset future tax liabilities. Federal net operating losses generated prior to 2018 of $27,522 can be carried back two years and carried forward 20 years. Federal net operating losses and federal tax credit carryforwards generated prior to 2018 will begin to expire in 2033. Federal net operating losses generated post 2017 of $21,787 can be carried forward indefinitely but can only offset 80 percent of annual taxable income. State net operating losses will begin to expire in 2033 and state tax credit carryforwards will begin to expire in 2031.

Management has evaluated the positive and negative evidence bearing upon the realizability of the Company's deferred tax assets, which are comprised principally of net operating loss carryforwards. Based on the Company's cumulative net losses since inception and its lack of revenue generating commercial products, the Company determined that it is more likely than not that it will not recognize the benefits of the deferred tax assets. As a result, the Company has recorded a full valuation allowance of approximately $15,097 at December 31, 2019. The Company increased its valuation allowance by $3,875 for the year ended December 31, 2019 in order to maintain a full valuation allowance against its deferred tax assets.

Under the provisions of Sections 382 and 383 of the Internal Revenue Code, or IRC, net operating loss and credit carryforwards and other tax attributes may be subject to limitation if there has been a significant change in ownership of the Company, as defined by the IRC. Future owner or equity shifts, including an initial public offering, could result in limitations on net operating loss and credit carryforwards.

The Company performed an analysis through December 31, 2018 pursuant to Section 382 of the IRC to determine whether any limitations might exist on the utilization of net operating losses and other tax attributes. Based on this analysis, the Company has determined that ownership changes occurred in 2014, resulting in an annual limitation of $169 on the use of its net operating losses and other tax attributes generated prior to the ownership change. To the extent that the Company raises additional equity financing or other changes in the ownership interest of significant stockholders occurs, additional tax attributes may become subject to an annual limitation. This could limit the amount of tax attributes that can be utilized annually to offset future taxable income or tax liabilities.

The Company files federal and Commonwealth of Massachusetts state income tax returns. The statute of limitations for assessment by the Internal Revenue Service, or IRS, and state tax authorities remains open for all tax years ended since the inception of the Company. To the extent the Company has tax attribute carryforwards, the tax years in which the attribute was generated may still be adjusted upon examination by the IRS or state tax authorities to the extent utilized in a future period. No federal or state tax audits are currently in process.

The Company evaluates tax positions for recognition using a more-likely-than-not recognition threshold, and those tax positions eligible for recognition are measured as the largest amount of tax benefit that is greater than 50% likely of being realized upon the effective settlement with a taxing authority that has full knowledge of all relevant information. The Company has not recorded any amounts for unrecognized tax benefits as of December 31, 2019 nor has it recorded any penalties or interest.

11. Net Loss Per Share Attributable to Common Stockholders and Unaudited Pro Forma Information

Net Loss Per Share Attributable to Common Stockholders

The following outstanding potentially dilutive shares have been excluded from the calculation of diluted net loss per share, as their effect is anti-dilutive:

	For the Year Ended December 31,	
	2019	**2018**
Convertible Preferred Stock	33,645,447	33,645,447
Stock options to purchase common stock	3,911,633	2,820,000
Non-vested restricted stock	200,000	200,000

Unaudited Pro Forma Information

The calculation of weighted average shares outstanding for purposes of calculating pro forma net loss per share attributable to common stockholders for the year ended December 31, 2019 assumes the conversion of 33,645,447 into common shares effective January 1, 2019.

12. Related Party Transactions

For the year ended December 31, 2019, the Company recorded expense of $145 for consulting services provided by an entity affiliated with its interim Chief Financial Officer, of which $20 is included in accrued expenses and other current liabilities as of December 31, 2019.

Except as disclosed in Note 6 in the notes to the accompanying consolidated financial statements, there were no other material transactions with related parties.

13. Subsequent Events

In February 2020, the Company entered into an agreement with a consultant that requires payment of a success fee calculated as a percentage of certain product sales, subject to a cumulative maximum payout of $5.0 million.

In May 2020, the Company filed an amendment to its certificate of incorporation to increase the authorized common stock to 80,529,575 shares and authorize 15,313,382 shares of Series D Preferred and 8,973,261 shares of Series D-1 convertible preferred stock (“Series D-1 Preferred”). The Company entered into a stock purchase agreement with certain investors and issued 15,313,382 shares of Series D Preferred for gross proceeds of $107,500. Upon the achievement of a clinical trial milestone, as defined in the stock purchase agreement, the investors will be obligated to purchase 2,991,087 shares of Series D-1 Preferred for gross proceeds of $35,833. In addition, the investors will have the right to purchase up to 5,982,174 shares of Series D-1 Preferred (“Additional Series D-1 Preferred”) at a price of $11.98 per share following achievement of the clinical development milestone discussed above and the receipt of certain preclinical data as defined in the stock purchase agreement. Unless previously exercised, the option to purchase the Additional Series D-1 Preferred will terminate eight days after the filing of a registration statement for an initial public offering of the Company’s common stock.

In May 2020, the Company and Novamedica terminated the license agreement discussed in Note 6. The Company paid a termination fee of $400 in connection with the termination.

ATEA PHARMACEUTICALS, INC.
Consolidated Balance Sheets
(in thousands, except share and per share amounts)
(Unaudited)

	June 30, 2020	December 31, 2019	Pro Forma June 30, 2020
Assets			
Current assets			
Cash and cash equivalents	$115,792	$ 21,661	$ 115,792
Prepaid expenses and other current assets	2,658	249	2,658
Total current assets	118,450	21,910	118,450
Property and equipment, net	39	41	39
Other assets	1,256	122	1,256
Total assets	$119,745	$ 22,073	$ 119,745
Liabilities, Convertible Preferred Stock and Stockholders' Equity (Deficit)			
Current liabilities			
Accounts payable	$ 3,860	$ 548	$ 3,860
Accrued expenses and other current liabilities	3,198	1,887	3,198
Total current liabilities	7,058	2,435	7,058
Other liabilities	69	95	69
Total liabilities	7,127	2,530	7,127
Commitments and contingencies (see Note 6)			
Convertible preferred stock, $0.001 par value; 57,932,090 and 33,645,447 shares authorized as of June 30, 2020 and December 31, 2020, respectively; 48,958,829 and 33,645,447 shares issued and outstanding as of June 30, 2020 and December 31, 2019, respectively; liquidation preference of $178,106 and $70,606 as of June 30, 2020 and December 31, 2019, respectively; no shares authorized, issued or outstanding pro forma as of June 30, 2020	175,745	69,114	—
Stockholders' equity (deficit):			
Common stock, $0.001 par value; 80,529,575 and 53,070,161 shares authorized as of June 30, 2020 and December 31, 2019, respectively; 10,109,847 and 10,091,100 shares issued and outstanding as of June 30, 2020 and December 31, 2019, respectively; 59,068,676 shares issued and outstanding pro forma as of June 30, 2020	10	10	59
Additional paid-in capital	5,057	4,632	180,753
Accumulated deficit	(68,194)	(54,213)	(68,194)
Total stockholders' equity (deficit)	(63,127)	(49,571)	112,618
Total liabilities, convertible preferred stock and stockholders' deficit	$119,745	$ 22,073	$ 119,745

The accompanying notes are an integral part of these consolidated financial statements.

ATEA PHARMACEUTICALS, INC.
Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except share and per share amounts)
(Unaudited)

	Six Months Ended June 30,	
	2020	**2019**
Operating expenses		
Research and development	$ 10,576	$ 4,270
General and administrative	3,472	1,820
Total operating expenses	14,048	6,090
Loss from operations	(14,048)	(6,090)
Interest income and other, net	67	343
Net loss and comprehensive loss	$ (13,981)	$ (5,747)
Net loss per share attributable to common stockholders—basic and diluted	$ (1.39)	$ (0.57)
Weighted-average common shares outstanding—basic and diluted	10,093,689	10,091,100
Pro forma net loss per share attributable to common stockholders—basic and diluted	$ (0.30)	
Pro forma weighted-average common shares outstanding—basic and diluted	47,292,517	

The accompanying notes are an integral part of these consolidated financial statements.

ATEA PHARMACEUTICALS, INC.
Consolidated Statements of Convertible Preferred Stock and Stockholders' Deficit

(in thousands, except share amounts)
(Unaudited)

	Convertible Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Deficit
	Shares	Amount	Shares	Amount			
Balance—December 31, 2018	33,645,447	$ 69,114	10,091,100	$ 10	$ 4,008	$ (40,179)	$ (36,161)
Stock-based compensation expense	—	—	—	—	293	—	293
Net loss	—	—	—	—	—	(5,747)	(5,747)
Balance—June 30, 2019	33,645,447	$ 69,114	10,091,100	$ 10	$ 4,301	$ (45,926)	$ (41,615)
Balance—December 31, 2019	33,645,447	$ 69,114	10,091,100	$ 10	$ 4,632	$ (54,213)	$ (49,571)
Issuance of Series D convertible preferred stock, net of issuance costs of $869	15,313,382	106,631	—	—	—	—	—
Issuance of common stock for exercise of stock options	—	—	18,747	—	27	—	27
Stock-based compensation expense	—	—	—	—	398	—	398
Net loss	—	—	—	—	—	(13,981)	(13,981)
Balance—June 30, 2020	48,958,829	$175,745	10,109,847	$ 10	$ 5,057	$ (68,194)	$ (63,127)

The accompanying notes are an integral part of these consolidated financial statements.

ATEA PHARMACEUTICALS, INC.
Consolidated Statements of Cash Flows
(in thousands)
(Unaudited)

	Six Months Ended June 30,	
	2020	**2019**
Cash flows from operating activities		
Net loss	$ (13,981)	$ (5,747)
Adjustments to reconcile net loss to net cash used in operating activities		
Stock-based compensation expense	398	293
Depreciation and amortization expense	8	9
Changes in operating assets and liabilities		
Prepaid expenses and other current assets	(2,409)	17
Accounts payable	2,643	327
Accrued expenses and other liabilities	1,035	(106)
Net cash used in operating activities	(12,306)	(5,207)
Cash flows from investing activities		
Additions to property and equipment	(6)	—
Net cash used in investing activities	(6)	—
Cash flows from financing activities		
Proceeds from issuance of convertible preferred stock, net of issuance costs	106,631	—
Proceeds from issuance of common stock for exercise of stock options	27	—
Payments of deferred offering costs	(215)	—
Net cash used in financing activities	106,443	—
Net increase (decrease) in cash, cash equivalents and restricted cash	94,131	(5,207)
Cash, cash equivalents and restricted cash at the beginning of period	21,768	34,599
Cash, cash equivalents and restricted cash at the end of period	$ 115,899	$ 29,392
Cash, cash equivalents and restricted cash at the end of period		
Cash and cash equivalents	$ 115,792	$ 29,285
Restricted cash	107	107
Total cash, cash equivalents and restricted cash	$ 115,899	$ 29,392
Supplemental disclosure of noncash financing activities		
Equity issuance costs included in accounts payable and accrued expenses	$ 919	$ —

The accompanying notes are an integral part of these consolidated financial statements.

ATEA PHARMACEUTICALS, INC.
Notes to Consolidated Financial Statements
(in thousands, except share and per share amounts.)
(Unaudited)

1. Nature of Organization

Organization

Atea Pharmaceuticals, Inc. (together with its subsidiary, “Atea” or “the Company”), is a biopharmaceutical company that was incorporated in July 2012 and began principal operations in March 2014. The Company is using a chemistry driven approach and its drug discovery and development capabilities to identify and develop novel antiviral therapeutics. The Company is located in Boston, Massachusetts. Atea Pharmaceuticals Securities Corporation, or Atea PSC, a Massachusetts corporation incorporated in 2016, is a wholly owned subsidiary of Atea.

Risks and Uncertainties

The Company is subject to risks and uncertainties common to clinical stage biopharmaceutical companies. These risks include, but are not limited to, potential failure of preclinical and clinical studies, uncertainties associated with research and development activities generally, competition from technical innovations of others, dependence upon key personnel, compliance with governmental regulations, the need to obtain marketing approval for any product candidate that the Company may discover and develop, the need to gain broad acceptance among patients, payers and health care providers to successfully commercialize any product for which marketing approval is obtained and the need to secure and maintain adequate intellectual property protection for the Company’s proprietary technology and products. Further, the Company is currently dependent on third-party service providers for much of its preclinical research, clinical development and manufacturing activities. Product candidates currently under development will require significant amounts of additional capital, additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval, prior to commercialization. Even if the Company is able to generate revenues from the sale of its product candidates, if approved, it may not become profitable. If the Company fails to become profitable or is unable to sustain profitability on a continuing basis, then it may be unable to continue its operations at planned levels and be forced to reduce its operations. The Company is also subject to risks associated with the COVID-19 global pandemic, including actual and potential delays associated with our ongoing and anticipated trials, and potential negative impacts on the Company’s business operations and its ability to raise additional capital to finance its operations.

The Company has financed its operations to date primarily from the sale of convertible preferred stock. Since its inception, the Company has incurred recurring operating losses and negative cash flows from operations. As of June 30, 2020, the Company had an accumulated deficit of $68,194. The Company expects to continue to generate operating losses for the foreseeable future. Management believes its existing cash resources will be sufficient to fund its operations as currently planned for at least twelve months following the issuance of these financial statements.

The Company is seeking to complete an initial public offering, or IPO, of its common stock. In the event that the Company does not complete an IPO, the Company may seek additional capital through one or more of a combination of private financing through the sale of additional equity securities, debt financing or funding in connection with any collaborative relationships it may enter into or other arrangements. There can be no assurance that the Company will be able to obtain such additional funding, on terms acceptable to the Company, on a timely basis or at all. The terms of any financing may adversely affect the holdings or the rights of the Company’s existing shareholders.

2. Summary of Significant Accounting Policies

Basis of Presentation and Use of Estimates

The accompanying unaudited consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America, or GAAP.

The preparation of unaudited financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and in these accompanying notes. The Company bases its estimates on historical experience, known trends and other market-specific or other relevant factors and assumptions that it believes to be reasonable under the circumstances. On an ongoing basis, management evaluates its estimates, which include but are not limited to estimates of accrued research and development expenses and the valuation of common stock in connection with the issuance of stock-based awards. Changes in estimates are recorded in the period in which they become known.

Principles of Consolidation

The unaudited consolidated financial statements include the accounts of the Company and Atea PSC. All intercompany amounts have been eliminated in consolidation.

Unaudited Interim Financial Information

The accompanying balance sheet as of June 30, 2020 and the statements of operations and comprehensive loss and of cash flows for the six months ended June 30, 2020 and 2019 are unaudited. The unaudited interim financial statements have been prepared on the same basis as the audited annual financial statements and, in the opinion of management, reflect all adjustments, which include only normal recurring adjustments, necessary for the fair statement of the Company's financial position as of June 30, 2020 and the results of its operations and its cash flows for the six months ended June 30, 2020 and 2019. The results for the six months ended June 30, 2020 are not necessarily indicative of results to be expected for the year ending December 31, 2020, any other interim periods, or any future year or period.

Cash and Cash Equivalents

The Company considers all highly liquid investments purchased with maturities of 90 days or less at acquisition to be cash equivalents. Cash and cash equivalents include bank demand deposits and money market funds that invest in U.S. government and U.S. government agency obligations. Cash equivalents are reported at fair value.

Concentrations of Credit Risk and Significant Suppliers

Financial instruments that potentially subject the Company to concentrations of credit risk are primarily cash and cash equivalents. The Company maintains its cash and cash equivalents with a financial institution that management believes is creditworthy. The Company's investment policy includes guidelines on the quality of the financial institutions and financial instruments and defines allowable investments that the Company believes minimizes the exposure to concentration of credit risk.

The Company is dependent on third-party manufacturers to supply products for research and development activities in its programs. In particular, the Company relies and expects to continue to rely on a small number of manufacturers to supply it with its requirements for the active pharmaceutical ingredients and formulated drugs related to these programs. These programs could be adversely affected by a significant interruption in the supply of active pharmaceutical ingredients and formulated drugs.

Fair Value Measurements

Assets and liabilities recorded at fair value on a recurring basis in the balance sheets are categorized based upon the level of judgment associated with the inputs used to measure their fair values. Fair value is defined as the exchange price that would be received for an asset or an exit price that would be paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The authoritative guidance on fair value measurements establishes a three-tier fair value hierarchy for disclosure of fair value measurements as follows:

Level 1—Observable inputs such as unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date.

Level 2—Observable inputs (other than quoted prices included in Level 1) that are either directly or indirectly observable for the asset or liability. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.

Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to determination of fair value of the assets or liabilities.

Cash, cash equivalents and restricted cash are Level 1 assets which are comprised of funds held in checking and money market accounts. Cash, cash equivalents and restricted cash were recorded at fair value as disclosed in Note 3. The carrying amounts of accounts payable and accrued expenses approximate their fair values due to their short-term maturities.

Property and Equipment

Property and equipment are stated at cost, less accumulated depreciation and amortization. Property and equipment are depreciated using the straight-line method over the estimated useful lives of the asset. The Company estimates the useful life of its assets as follows:

Asset	Estimated useful life
Laboratory equipment	Five years
Office furniture and fixtures	Five years
Computer hardware	Two years
Leasehold improvements	Shorter of useful life or remaining lease term

Maintenance and repairs that do not improve or extend the life of the respective asset are expensed to operations as incurred. Upon disposal of an asset, the related cost and accumulated depreciation are removed from the accounts and any resulting gain or loss is included in the results of operations.

Other Assets

The Company capitalizes incremental legal, professional, accounting and other third-party fees that are directly associated with the planned IPO as other non-current assets until the IPO is consummated. After consummation of the IPO, these costs will be recorded in stockholders' equity as a reduction of additional paid-in-capital generated as a result of the offering. If the Company terminates its plan for an IPO, any costs deferred will be expensed immediately. As of June 30, 2020, equity issuance costs of $1,149 were included in Other assets in the accompanying consolidated balance sheet. Also included in Other assets is restricted cash of $107, to collateralize a letter of credit.

Impairment of Long-lived Assets

The Company reviews long-lived assets when events or changes in circumstances indicate the carrying value of the assets may not be recoverable. Recoverability is measured by comparing the book value of the assets to the estimated undiscounted future net cash flows that the asset is expected to generate. If the estimated undiscounted future net cash flows are less than the book value, the asset is impaired, and the impairment loss to be recognized in income is measured as the amount by which the book value of the asset exceeds its fair value, which is measured based on the estimated discounted future net cash flows that the asset is expected to generate. No impairment losses were recorded during the six months ended June 30, 2020 and 2019.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development expenses consist principally of costs associated with outsourced research and development activities, including preclinical and clinical development, manufacturing and research conducted by contract research organizations and academic institutions, employee compensation and consulting expenses together with related expenses, professional fees and facility and overhead costs. Facility and overhead costs primarily include the allocation of rent, utility and office-related expenses attributable to research and development personnel. In circumstances where amounts have been paid in advance or in excess of costs incurred, the Company records a prepaid expense, which is expensed as services are performed or goods are delivered.

The Company has entered into various research and development contracts with third parties. These agreements are generally cancelable, and related payments are recorded as research and development expenses as incurred. The Company records accruals for estimated ongoing research costs. When evaluating the adequacy of the accrued liabilities, the Company analyzes progress of the studies, including the phase of completion of events, invoices received and contracted costs. Significant judgments and estimates are made in determining the accrued balances at the end of any reporting period. Actual results could differ from the Company's estimates. The Company's historical accrual estimates have not been materially different from the actual costs.

Patent Costs

Costs to secure and maintain the Company's patents are expensed as incurred and are classified as general and administrative expenses in the Company's consolidated statements of operations.

Stock-based Compensation

Stock-based compensation expense is classified in the consolidated statement of operations in the same manner in which the award recipient's payroll costs are classified or in which the award recipients' service payments are classified. Stock-based awards granted to employees and non-employees are measured based on the estimated fair value of the awards using the Black-Scholes option pricing model, or Black-Scholes. Stock-based compensation expense with respect to awards with service conditions is recognized using the straight-line method over the service period. Stock-based compensation with respect to awards with performance conditions is recognized when satisfaction of the performance conditions is probable. Stock-based compensation is based on awards ultimately expected to vest and, as such, it is reduced by forfeitures. The Company accounts for forfeitures as they occur.

Black-Scholes requires the use of subjective assumptions which determine the fair value of stock-based awards. These assumptions include:

Fair value of common stock—Historically, because there has been no public market for the Company's common stock, the fair value of the Company's common stock underlying stock-based awards was estimated on each grant date by the board of directors.

Risk-free interest rate—The risk-free interest rate is based on the U.S. Treasury zero coupon issues in effect at the time of grant for periods corresponding with the expected term of a stock-based award.

Expected term—The expected term represents the period that stock-based awards are expected to be outstanding. Given the Company's lack of specific history, the expected term for option grants is determined using the simplified method. The simplified method deems the term to be the average of the time-to-vesting and the contractual life of the stock-based awards.

Expected volatility—Since the Company is privately held and does not have any trading history for its common stock, the expected volatility is estimated based on the average volatility for comparable publicly traded biotechnology companies over a period equal to the expected term of the stock-based awards. The comparable companies were chosen based on their similar size, stage in the life cycle or area of specialty. The Company will continue to apply this process until a sufficient amount of historical information regarding the volatility of its own stock price becomes available.

Expected dividend yield —The Company has never paid dividends on its common stock and has no plans to pay dividends on its common stock. Therefore, the Company used an expected dividend yield of zero.

Income Taxes

The Company uses the asset and liability method of accounting for income taxes. Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax base. Deferred tax assets, which relate primarily to the carrying amount of the Company's net operating loss carryforwards, are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. Deferred tax expense or benefit is the result of changes in the deferred tax assets and liabilities. Valuation allowances are established to reduce deferred tax assets where, based upon the available evidence, the Company concludes that it is more-likely-than-not that the deferred tax assets will not be realized. In evaluating its ability to recover deferred tax assets, the Company considers all available positive and negative evidence, including its operating results, ongoing tax planning and forecasts of future taxable income.

Reserves are provided for tax benefits for which realization is uncertain. Such benefits are only recognized when the underlying tax position is considered more-likely-than-not to be sustained on examination by a taxing authority. Interest and penalties related to uncertain tax positions are recognized in the provision of income taxes.

Comprehensive Loss

Comprehensive income (loss) includes net income (loss) as well as other changes in stockholder equity (deficit) that result from transactions and economic events other than those with equity holders. The Company did not have any items of comprehensive income or loss other than net loss for the six months ended June 30, 2020 and 2019.

Net Loss Per Share Attributable to Common Stockholders

The Company calculates basic and diluted net loss per share attributable to common stockholders in conformity with the two-class method required for participating securities. The Company considers its convertible preferred stock to be participating securities as, in the event a dividend is paid on common stock, the holders of convertible preferred stock would be entitled to receive dividends on a basis consistent with the common stockholders. Under the two-class method, the net loss attributable to common stockholders is not allocated to the convertible preferred stock as the holders of the convertible preferred stock do not have a contractual obligation to share in losses.

Since inception, the Company has incurred recurring operating losses and, as such, under the two-class method, basic net loss per share attributable to common stockholders is computed by dividing the net loss attributable to common stockholders by the weighted average number of shares of common stock. Under the two-class method, for periods with net income, basic net income per common share is computed by dividing the net income attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period. Net income attributable to common stockholders is computed by subtracting from net income the portion of current year earnings that the participating securities would have been entitled to receive pursuant to their dividend rights had all of the year's earnings been distributed. No such adjustment to earnings is made during periods with a net loss, as the holders of the participating securities have no obligation to fund losses. Diluted net loss per common share is computed by using the weighted-average number of shares of common stock outstanding. Due to net losses for the six months ended June 30, 2020 and 2019, basic and diluted net loss per share attributable to common stockholders were the same, as the effect of all potentially dilutive securities would have been anti-dilutive.

Pro Forma Information

Upon closing of a qualified public offering, all of the Company's outstanding shares of convertible preferred stock will automatically convert into shares of common stock. The accompanying unaudited pro forma condensed consolidated balance sheet as of June 30, 2020 has been prepared to give effect to the conversion of all outstanding shares of the Company's preferred stock into an aggregate of 48,958,829 shares of common stock as if the conversion had occurred on June 30, 2020. The unaudited pro forma basic and diluted net loss per share were computed using the weighted average number of common shares outstanding after giving effect to the conversion of all the convertible preferred stock into shares of common stock as if such conversion had occurred at the beginning of the period presented or the date of original issuance, if later.

Segments

Operating segments are defined as components of an entity for which separate financial information is available and that is regularly reviewed by the chief operating decision maker, or CODM, in deciding how to allocate resources to an individual segment and in assessing performance. The Company's CODM is its chief executive officer, who manages and allocates resources to the operations on a total company basis. Accordingly, there is a single operating segment and one reportable segment.

Emerging Growth Company Status

The Company is an emerging growth company, as defined in the Jumpstart Our Business Startups Act of 2012, or JOBS Act. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act, until such time as those standards apply to private companies. The Company has elected to use this extended transition period for complying with new or revised accounting standards that have different effective dates for public and private companies until the earlier of the date that it (i) is no longer an emerging growth company or (ii) affirmatively and irrevocably opts out of the extended transition period provided in the JOBS Act. As a result, these consolidated financial statements may not be comparable to companies that comply with the new or revised accounting pronouncements as of public company effective dates.

Recently Issued Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board ("FASB") issued ASU No. 2016-02, *Leases*, which requires a lessee to record a right-of-use asset and a corresponding lease liability on the balance sheet for all leases with terms longer than 12 months. A modified retrospective transition approach is required for lessees for capital and operating leases existing at, or entered into after, the beginning of the earliest comparative

period presented in the financial statements, with certain practical expedients available. As the Company has elected to use the extended transition period for complying with new or revised accounting standards as available under the Jobs Act, the standard is effective for the Company beginning January 1, 2021, with early adoption permitted. The Company is currently evaluating the expected impact that the standard could have on its consolidated financial statements and related disclosures.

In July 2017, the FASB issued ASU No. 2017-11, *Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480), Derivatives and Hedging (Topic 815) I. Accounting for Certain Financial Instruments with Down Round Features II. Replacement of the Indefinite Deferral for Mandatorily Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatorily Redeemable Noncontrolling Interests with a Scope Exception ("ASU 2017-11").* Part I applies to entities that issue financial instruments such as warrants, convertible debt or convertible preferred stock that contain down-round features. Part II replaces the indefinite deferral for certain mandatorily redeemable noncontrolling interests and mandatorily redeemable financial instruments of nonpublic entities contained within ASC Topic 480 with a scope exception and does not impact the accounting for these mandatorily redeemable instruments. As the Company has elected to use the extended transition period for complying with new or revised accounting standards as available under the Jobs Act, the standard is effective for the Company beginning January 1, 2021, with early adoption permitted. The Company is currently evaluating the expected impact that the standard could have on its consolidated financial statements and related disclosures.

Recently Adopted Accounting Pronouncements

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers* (Topic 606) ("ASU 2014-09"), which supersedes existing revenue recognition guidance under GAAP. The standard's core principle is that a company will recognize revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. The standard defines a five-step process to achieve this principle and will require companies to use more judgment and make more estimates than under the current guidance. The Company expects that these judgments and estimates will include identifying performance obligations in the customer contract, estimating the amount of variable consideration to include in the transaction price and allocating the transaction price to each separate performance obligation. ASU 2014-09 also requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts. In August 2015, the FASB issued ASU No. 2015-14, Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date, which delays the effective date of ASU 2014-09 such that the standard is effective for annual periods beginning after December 15, 2018. The FASB subsequently issued amendments to ASU 2014-09 that have the same effective date and transition date. The Company adopted ASU 2014-09 as of January 1, 2019 and the adoption did not have an impact on the Company's consolidated financial statements as the Company does not currently have any revenue-generating arrangements.

In August 2018, the FASB issued ASU 2018-13, *Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurements,* which changes the fair value measurement disclosure requirements of ASC 820. The goal of the ASU is to improve the effectiveness of ASC 820's disclosure requirements. The standard is applicable to the Company for fiscal years beginning January 1, 2020, and interim periods within those years. The Company elected to early adopt this guidance effective January 1, 2019. The adoption of this guidance did not have an effect the Company's consolidated financial statements.

3. Fair Value Measurements

The following tables present information about the Company's financial assets measured at fair value on a recurring basis and indicate the level of the fair value hierarchy utilized to determine such fair values:

	Fair Value Measurements as of June 30, 2020			
	Level 1	Level 2	Level 3	Total
Cash equivalents				
Money market funds	$106,603	$ —	$ —	$106,603
Total cash equivalents	$106,603	$ —	$ —	$106,603

	Fair Value Measurements as of December 31, 2019			
	Level 1	Level 2	Level 3	Total
Cash equivalents				
Money market funds	$21,038	$ —	$ —	$21,038
Total cash equivalents	$21,038	$ —	$ —	$21,038

The Company's assets with fair value categorized as Level 1 within the fair value hierarchy include money market funds. Money market funds are publicly traded mutual funds and are presented as cash equivalents on the consolidated balance sheets as of June 30, 2020 and December 31, 2019.

There were no transfers among Level 1, Level 2 or Level 3 categories in the six months ended June 30, 2020 and 2019.

4. Property and Equipment, net

Property and equipment, net, consist of the following:

	June 30, 2020	December 31, 2019
Laboratory equipment	$ 5	$ 5
Office furniture and fixtures	13	13
Computer hardware	17	11
Leasehold improvements	125	125
Total property and equipment, at cost	160	154
Less: accumulated depreciation and amortization	(121)	(113)
Property and equipment, net	$ 39	$ 41

Depreciation and amortization expense was $8 and $9 for the six months ended June 30, 2020 and 2019, respectively.

5. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consist of the following:

	June 30, 2020	December 31, 2019
Research and development	$ 2,169	$ 1,326
License fees (Note 6)	—	200
Professional fees and other	631	361
Payroll and payroll related	398	—
Total accrued expenses and other current liabilities	$ 3,198	$ 1,887

6. Commitments and Contingencies

Operating Lease Agreements

The Company leases an office facility under a non-cancelable operating lease that expires July 2022. The office lease includes commitments obligating the Company to pay a pro rata share of certain building operating costs and annual rent escalations which will result in higher lease payments in future years. Rent expense is recognized on a straight-line basis over the term of the lease with the difference between expense and the payments recorded as deferred rent, which is included in accrued expenses and other current liabilities and other liabilities.

As of June 30, 2020, future minimum payments for operating leases are as follows:

2020	$169
2021	340
2022	200
Total future minimum lease payments	$709

Rent expense recognized under all operating leases was $141 and $141 for six months ended June 30, 2020 and 2019, respectively.

The Company is required to maintain a letter of credit for the duration of the office lease. The Company maintains bank deposits of $107 to collateralize the letter of credit which are classified as restricted cash and a long-term asset in the consolidated balance sheet as of June 30, 2020.

License Agreement with NovaMedica LLC

In May 2014, the Company entered into an exclusive license agreement with NovaMedica LLC, an affiliated entity of a stockholder, pursuant to which the Company granted NovaMedica a license to certain intellectual property rights for commercialization of a potential product for the treatment of hepatitis C. In connection with the license, the Company received a license fee of $200 in partial consideration for the grant of the license. Recognition of the license fee has been deferred and recorded in other liabilities until both the Company and NovaMedica finalize certain other terms and conditions of the license agreement at which time the technology access fee will be evaluated, along with the license agreement broadly, for revenue recognition.

If the Company and NovaMedica failed to agree on the terms of an amendment to the license agreement covering certain payment terms, and the license agreement was thereafter terminated, such termination was to be subject to a payment by the Company of a termination fee of $400. This agreement was terminated in May 2020, and the Company paid a termination fee of $400.

Business Development Consulting Agreements

The Company is a party to a consulting agreement that provides for the payment by the Company of consideration, consisting of cash, up to a maximum of $1,750, and the vesting of equity awards, if a business development transaction that meets or exceeds certain thresholds is successfully concluded on or before December 31, 2020 (Note 9). As of June 30, 2020, the performance conditions were not yet probable of being met and, as a result, no expense has yet to be recognized in connection with the consulting agreement in the consolidated statement of operations.

In February 2020, the Company entered into an agreement with a consultant that requires payment of a success fee calculated as a percentage of certain product sales, subject to a cumulative maximum payout of $5,000.

Indemnification

The Company enters into certain types of contracts that contingently requires the Company to indemnify various parties against claims from third parties. These contracts primarily relate to (i) the Company's bylaws, under which the Company must indemnify directors and executive officers, and may indemnify other officers and employees, for liabilities arising out of their relationship, (ii) contracts under which the Company must indemnify directors and certain officers and consultants for liabilities arising out of their relationship, and (iii) procurement, service or license agreements under which the Company may be required to indemnify vendors, service providers or licensees for certain claims, including claims that may be brought against them arising from the Company's acts or omissions with respect to the Company's products, technology, intellectual property or services.

From time to time, the Company may receive indemnification claims under these contracts in the normal course of business. In the event that one or more of these matters were to result in a claim against the Company, an adverse outcome, including a judgment or settlement, may cause a material adverse effect on the Company's future business, operating results or financial condition. It is not possible to determine the maximum potential amount potentially payable under these contracts since the Company has no history of prior indemnification claims and the unique facts and circumstances involved in each particular claim will be determinative.

7. Convertible Preferred Stock

In May 2020, the Company filed an amendment to its certificate of incorporation to authorize 15,313,382 shares of Series D Preferred and 8,973,261 shares of Series D-1 convertible preferred stock ("Series D-1 Preferred"). The Company entered into a stock purchase agreement with certain investors and issued 15,313,382 shares of Series D Preferred for gross proceeds of approximately $107,500. Upon the achievement of a clinical trial milestone, as defined in the stock purchase agreement, the Series D investors will be obligated to purchase 2,991,087 shares of Series D-1 Preferred for gross proceeds of approximately $35,833. In addition, the Series D investors will have the right to purchase up to 5,982,174 shares of Series D-1 Preferred ("Additional Series D-1 Preferred") at a price of $11.98 per share following achievement of the clinical development milestone discussed above and the receipt of certain preclinical data as defined in the stock purchase agreement. Unless previously exercised, the option to purchase the Additional Series D-1 Preferred will terminate (i) eight days after the filing of a registration statement on Form S-1 for the IPO or (ii) in the event that the clinical development milestone discussed above occurs after the filing of a registration statement on a Form S-1 for the IPO and prior to the consummation of the Company's IPO, upon the consummation of the Company's IPO. The Company concluded that the tranche features are not freestanding financing instruments as the right to purchase the future tranches are not legally detachable from the shares of Series D Preferred Stock. Additionally, the Company concluded that no beneficial conversion features were present at initial issuance.

As of June 30, 2020, the Company had 57,932,090 shares of convertible preferred stock, or Convertible Preferred Stock, authorized, of which 20,000,000 shares are designated as Series A convertible preferred stock, or Series A Preferred; 7,592,830 shares are designated as Series B convertible preferred stock, or Series B Preferred; 6,052,617 shares are designated as Series C convertible preferred stock, or Series C Preferred; 15,313,382 shares are designated as Series D convertible preferred stock, or Series D Preferred; and 8,973,261 shares are designated as Series D-1 convertible preferred stock, or Series D-1 Preferred. The Company's Series A Preferred, Series B Preferred, Series C Preferred and Series D Preferred were issued at $1.00, $3.03, $4.56 and $7.02 per share, respectively.

The following table summarizes the Company's outstanding Convertible Preferred Stock:

				June 30, 2020	
	Preferred Stock Authorized	Preferred Stock Issued and Outstanding	Carrying Value	Liquidation Preference	Common Stock Issuable Upon Conversion
Series A Preferred	20,000,000	20,000,000	$ 19,136	$ 20,000	20,000,000
Series B Preferred	7,592,830	7,592,830	22,619	23,006	7,592,830
Series C Preferred	6,052,617	6,052,617	27,359	27,600	6,052,617
Series D Preferred	15,313,382	15,313,382	106,631	107,500	15,313,382
Series D-1 Preferred	8,973,261	—	—	—	—
	57,932,090	48,958,829	$175,745	$ 178,106	48,958,829

The Company classifies Convertible Preferred Stock outside of stockholders' deficit because the shares contain deemed liquidation rights in the event of a merger, consolidation, or reorganization involving the Company or a subsidiary or upon the sale, lease, transfer, exclusive license or other disposition by the Company or a subsidiary of all or substantially all assets of the Company that could trigger a distribution of cash or assets and therefore a contingent redemption feature not solely within the Company's control.

The rights and preferences of Convertible Preferred Stock are described below:

Voting

Holders of the preferred stock are entitled to vote, together with the holders of common stock, on all matters as to which holders of common stock are entitled to vote, except with respect to matters which Delaware General Corporation Law, or DGCL, or the certificate of incorporation requires a vote by a separate class. Each holder of Convertible Preferred Stock is entitled to one vote for each share of common stock into which the Convertible Preferred Stock is convertible at the time of such vote.

Certain actions specified in the certificate of incorporation require the affirmative vote of Requisite Preferred Holders, which are the holders of a majority of the Series B Preferred, Series C Preferred and Series D Preferred voting together as a single class, while other actions require: (i) the affirmative vote of holders of greater than 50% of Series D Preferred voting as a separate class; (ii) the affirmative vote of holders of at least 57% of Series C Preferred voting as a separate class; (iii) the affirmative vote of holders of at least 67% of the Series B Preferred voting as a separate class; or (iv) the affirmative vote of holders of a majority of the outstanding Convertible Preferred Stock voting as a single class.

At any time when an aggregate of 15,000,000 shares of Convertible Preferred Stock are outstanding, the affirmative vote of the Requisite Preferred Holders is required to (i) purchase, redeem or pay or declare any dividend or make any distribution on any class of stock other than certain specified transactions; or (ii) create or authorize the creation of any class or series of capital stock unless the new class ranks junior to the Convertible Preferred Stock.

At any time when at least 3,800,000 shares of Series B Preferred are outstanding, the affirmative vote of the holders of at least 67% of the Series B Preferred is required to: (i) amend, alter or repeal the certificate of incorporation or bylaws in any way that adversely affects the powers, preferences or rights of the holders of Series B Preferred; or (ii) increase or decrease the authorized number of shares of Series B Preferred.

At any time when at least 2,200,000 shares of Series C Preferred are outstanding, the affirmative vote of the holders of at least 57% of the Series C Preferred is required to: (i) amend, alter or repeal the certificate of incorporation or bylaws in any way that adversely affects the powers, preferences or rights of the holders of Series C preferred; or (ii) increase or decrease the authorized number of shares of Series C Preferred.

At any time when at least 6,500,000 shares of Series D Preferred are outstanding, the affirmative vote of the holders of at least 50% of the Series D Preferred is required to: (i) amend, alter or repeal the certificate of incorporation or bylaws in any way that adversely affects the powers, preferences or rights of the holders of Series D preferred; (ii) purchase, redeem or pay or declare any dividend or make any distribution on any class of stock other than certain specified transactions; (iii) increase or decrease the authorized number of shares of Series D Preferred; or (iv) approve any liquidation event in which a holder of Series D Preferred would receive less than $14.04 per share in connection with such event.

As long as at least 15,000,000 shares of Convertible Preferred Stock are outstanding, the affirmative vote of the Requisite Preferred Holders, which are the holders of a majority of the outstanding Convertible Preferred Stock, voting as a single class, is required to affect any liquidation, dissolution, or winding up of the business and affairs of the Company.

The holders of Series A Preferred, Series B Preferred, Series C Preferred and Series D Preferred, voting respectively as separate classes, each have the right to elect a director to the board of directors. The right to elect such a director shall continue for holders of Series A Preferred for so long as 5,000,000 shares of Series A Preferred are outstanding, for holders of Series B Preferred for so long as 5,000,000 shares of Series B Preferred are outstanding, for holders of Series C Preferred for so long as 2,741,228 shares of Series C Preferred are outstanding and for holders of Series D Preferred for so long as 7,000,000 shares of Series D Preferred are outstanding. The remainder of the board of directors, excluding one director that may be elected by holders of common stock voting as a separate class, is elected by the holders of the Convertible Preferred Stock voting together with holders of the common stock as a single class and otherwise in accordance with the stockholders' agreement.

Dividends

Holders of shares of Convertible Preferred Stock are entitled to dividends only if, when and as declared by the board of directors. The Company is prohibited from declaring, paying or setting aside any dividends unless the holders of the then outstanding Convertible Preferred Stock receive first, or simultaneously, in the case of a dividend on common stock, on a *pari passu* basis, a dividend in an amount that is at least equal to the amount that would have been received by the holders of the Convertible Preferred Stock had all the Convertible Preferred Stock been converted to common stock. As of June 30, 2020, no dividends have been declared or paid on the Convertible Preferred Stock.

Liquidation Preference

In the event of any liquidation, dissolution, winding up of the affairs or deemed liquidation event of the Company, the holders of Series D Preferred are entitled to receive in preference to the holders of Series C Preferred, an amount equal to the greater of (1) the original purchase price of the Series D Preferred plus all declared but unpaid dividends, or (2) such amount per share of Series D Preferred payable as if converted into common stock. After the preferential payment to the Series D Preferred, the holders of Series C Preferred are entitled to receive in preference to the holders of Series A Preferred and Series B Preferred and the common

stock, an amount equal to the greater of (1) the original purchase price of the Series C Preferred plus all declared but unpaid dividends, or (2) such amount per share of Series C Preferred payable as if converted into common stock. After the preferential payment to holders of the Series C Preferred, the holders of Series A Preferred and Series B Preferred, on a *pari passu* basis and prior and in preference to the holders of common stock, are entitled to receive an amount equal to the greater of (1) the original purchase price of the applicable series of preferred stock plus all declared but unpaid dividends, or (2) such amount per share of preferred stock payable as if converted into common stock. After the preferential distributions are made to the holders of Convertible Preferred Stock, any remaining assets of the Company will be distributed ratably among the holders of common stock. If the assets or surplus funds to be distributed to the holders of the Convertible Preferred are insufficient to permit the payment to such holders of their full preferential amount, the assets and surplus funds legally available for distribution will be distributed in preferential order, first to the holders of Series D Preferred and next to the holders of Series C Preferred and next to the holders of Series A Preferred and Series B Preferred, in each instance, ratably in proportion to the respective amount that would have been paid if all amounts payable on or with respect to such shares had been paid in full.

In the event of a deemed liquidation event, holders of Convertible Preferred Stock may require the Company to redeem their shares at a price equal to the liquidation amount.

Conversion

Each share of Convertible Preferred Stock is convertible into common stock on a one-for-one basis. Conversion is at the option of the holder of the Convertible Preferred Stock except upon either the closing of a firm commitment underwritten public offering with an equity valuation of at least $800,000, or upon the written election of the majority of the holders of the Series D Preferred. The conversion price of each of the Series D Preferred, Series C Preferred, Series B Preferred and Series A Preferred at June 30, 2020 is equal to the respective original issue price of each series.

The conversion price is subject to adjustment in accordance with provisions in the certificate of incorporation. Specifically, the holders of Convertible Preferred Stock are entitled to weighted average anti-dilution protection in the event that the Company issues additional securities at a purchase price less than the then effective conversion price.

Registration Rights

The holders of the Convertible Preferred Stock may require the Company in certain circumstances to register for sale the shares of common stock issuable upon conversion of the Convertible Preferred Stock. Such registration would permit the sale of the underlying common stock under the Securities Act of 1933, as amended.

Participation Rights in Future Equity Issuances

All holders of Convertible Preferred Stock have a pro rata right, based on their percentage equity ownership in the Company, to participate, subject only to certain limited exceptions, in subsequent issuances of equity securities of the Company. In addition, should any such holder choose not to purchase its full pro rata share, the remaining holders of Convertible Preferred Stock have the right to purchase the remaining pro rata shares.

Redemption rights

Convertible Preferred Stock has no stated redemption features. However, the Convertible Preferred Stock does contain deemed liquidation rights in the event of a merger, consolidation, or reorganization involving the Company or a subsidiary or on the sale, lease, transfer, exclusive license or other disposition by the Company or

a subsidiary of all or substantially all assets of the Company that could trigger a distribution of cash or assets not solely within the Company's control.

8. Common Stock

At June 30, 2020, the authorized capital of the Company included 80,529,575 shares of common stock, of which 10,109,847 shares of common stock were considered issued and outstanding for accounting purposes. As discussed in Note 9, restricted stock awards for an aggregate 200,000 shares are excluded from issued and outstanding shares for accounting purposes. On all matters to be voted upon by the holders of common stock, holders of common stock are entitled to one vote per share. Subject to the rights and preferences applicable to the outstanding shares of Convertible Preferred Stock, the holders of common stock are entitled to receive dividends, when declared by the board, and to share ratably in the Company's assets legally available for distribution to the holders of the Company's stock in the event of liquidation. The holders of common stock have no preemptive, redemption or conversion rights.

The Company had the following reserved shares of common stock:

	June 30, 2020
Series A Preferred	20,000,000
Series B Preferred	7,592,830
Series C Preferred	6,052,617
Series D Preferred	15,313,382
Outstanding options	4,186,747
Options available for future grant	3,349,277
	56,494,853

9. Stock-based Compensation

As of June 30, 2020, the Atea Pharmaceuticals 2013 Equity Incentive Plan, as amended, or 2013 Plan, provides for the grant of incentive stock options, non-qualified stock options, restricted common stock awards and other awards for up to 10,979,971 shares of common stock to employees, officers, directors and consultants of the Company.

As of June 30, 2020, options to purchase 4,280,494 shares of common stock and 3,370,000 shares of restricted common stock have been granted under the 2013 Plan, and there were 3,329,477 shares of common stock remaining available for future issuance.

Restricted Common Stock

Restricted stock awards generally include vesting and risk of forfeiture provisions that lapse upon satisfaction of performance conditions or over time periods commencing on the grant date and concluding on the third or fourth anniversary of the grant date. The Company has granted awards totaling 200,000 shares of restricted common stock to a consultant pursuant to the 2013 Plan for consulting and business development services. The consultant paid $1.21 per share and an aggregate of $121 for 100,000 of the shares of restricted common stock in 2016 and $1.24 per share and an aggregate of $124 for 100,000 of the shares of restricted common stock in 2018. These awards of restricted common stock will vest, and the risk of forfeiture will lapse upon satisfaction of performance conditions detailed in each award. As of June 30, 2020, the performance conditions were not yet probable of being met and, as a result, no compensation expense has yet been recognized for these performance-based awards. The unvested and forfeitable common stock as of June 30, 2020, though legally

issued, are excluded from issued and outstanding shares for accounting purposes. Amounts received for the unvested and forfeitable common stock totaling $245 are included in additional paid-in capital within stockholders' deficit in the consolidated balance sheets. At June 30, 2020, total unrecognized compensation expense related to unvested restricted common stock was $370.

Stock Options

The following summarizes stock option activity:

	Number of Shares	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Outstanding at January 1, 2020	3,911,633	$ 1.50	8.5	$ 3,915
Granted	293,861	$ 1.57		
Exercised	(18,747)	$ 1.43		
Outstanding at June 30, 2020	4,186,747	$ 1.51	8.1	$ 10,984
Options exercisable at June 30, 2020	2,361,875	$ 1.40	7.4	$ 6,440
Vested or expected to vest at June 30, 2020	4,186,747	$ 1.51	8.1	$ 10,984

The aggregate intrinsic value of options granted is calculated as the difference between the exercise price of the options and the estimated fair value of the Company's common stock for those options that had exercise prices lower than the fair value of the Company's common stock.

Option grants generally vest over a service period of three or four years and have a contractual term of ten years. There were no options, forfeited or expired during the six months ended June 30, 2020. As of June 30, 2020, total unrecognized compensation expense related to stock option awards was $1,845, which amount is being recognized over a remaining weighted average period of 3 years.

Stock-based Compensation Expense

Stock-based compensation expense is classified as follows:

	Six Months Ended June 30,	
	2020	2019
Research and development expense	$ 157	$ 125
General and administrative	241	168
Total stock-based compensation expense	$ 398	$ 293

10. Net Loss Per Share Attributable to Common Stockholders and Pro Forma Information

Net Loss Per Share Attributable to Common Stockholders

The following outstanding potentially dilutive shares have been excluded from the calculation of diluted net loss per share, as their effect is anti-dilutive:

	Six Months Ended June 30,	
	2020	**2019**
Convertible Preferred Stock	48,958,829	33,645,447
Stock options to purchase common stock	4,186,747	2,820,000
Non-vested restricted stock	200,000	200,000

Pro Forma Information

The calculation of weighted average shares outstanding for purposes of calculating pro forma net loss per share attributable to common stockholders for the six months ended June 30, 2020 assumes the conversion of 33,645,447 shares of convertible preferred stock into common shares effective January 1, 2020 and 15,313,382 shares of Series D convertible preferred stock into common shares effective May 19, 2020.

11. Income Taxes

The Company incurred net operating losses and recorded a full valuation allowance against net deferred tax assets for all periods presented. Accordingly, the Company has not recorded a provision for federal or state income taxes.

12. Related Party Transactions

For the six months ended June 30, 2020, the Company recorded expense of $40 for consulting services provided by an entity affiliated with its interim Chief Financial Officer, of which $19 is included in accounts payable as of June 30, 2020.

Except as disclosed in Note 6 in the notes to the accompanying consolidated financial statements, there were no other material transactions with related parties.

13. Subsequent Events

The holders of the Company's Series D Convertible Preferred Stock had an obligation to purchase 2,991,087 shares of Series D-1 Preferred for gross proceeds of $35,833 upon the Company's achievement of a clinical trial milestone. In addition, the investors had the right to purchase up to 5,982,174 shares of Series D-1 Preferred ("Additional Series D-1 Preferred") at a price of $11.98 per share following achievement of the clinical development milestone discussed above and the receipt of certain preclinical data as defined in the stock purchase agreement. In October 2020, the investors exercised their option in full resulting in the issuance of 8,973,261 shares of Series D-1 Preferred stock at a purchase price of $11.98 for gross proceeds of $107,500.

In October 2020, the Company entered into a license agreement, ("the License Agreement") with F. Hoffmann-La Roche Ltd and Genentech, Inc. (collectively "Roche"), granting Roche an exclusive license to develop and commercialize certain of the Company's compounds outside of the United States.

Atea is responsible for completing certain ongoing non-clinical and clinical activities at its own expense and supplying certain clinical trial material under the License Agreement. The parties will work collaboratively on a global development plan intended to support regulatory approval and will share joint development costs equally.

In connection with the License Agreement, Roche will pay the Company an upfront payment of $350 million. The License Agreement further provides that Roche is obligated to pay the Company up to $330 million in the aggregate upon the achievement of certain development or regulatory milestone events; up to $320 million in the aggregate upon the achievement of certain sales based milestone events; and tiered royalties based on annual net sales of the products covered by the License Agreement, ranging between low double-digit and mid-twenties, subject to certain adjustments and limitations. Roche has the right to terminate the License Agreement for convenience pursuant to the terms of the agreement.

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Through and including , 2020, (the 25th day after the date of this prospectus), all dealers effecting transactions in the Common Stock, whether or not participating in this offering, may be required to deliver a prospectus. This delivery requirement is in addition to a dealer's obligation to deliver a prospectus when acting as an underwriter and with respect to an unsold allotment or subscription.

Shares

ATEA PHARMACEUTICALS, INC.

Common Stock

PRELIMINARY PROSPECTUS

J.P. Morgan

Morgan Stanley

Evercore ISI

William Blair

, 2020

Part II
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

The following table indicates the expenses to be incurred in connection with the offering described in this registration statement, other than underwriting discounts and commissions, all of which will be paid by us. All amounts are estimated except the Securities and Exchange Commission registration fee, the Financial Industry Regulatory Authority, Inc., or FINRA, filing fee and the Nasdaq listing fee.

	Amount
Securities and Exchange Commission registration fee	$ 10,910
FINRA filing fee	15,500
Nasdaq initial listing fee	*
Accountants' fees and expenses	*
Legal fees and expenses	*
Blue Sky fees and expenses	*
Transfer Agent's fees and expenses	*
Printing and engraving expenses	*
Miscellaneous	*
Total expenses	$ *

* To be filed by amendment.

Item 14. Indemnification of Directors and Officers.

Section 102 of the General Corporation Law of the State of Delaware permits a corporation to eliminate the personal liability of directors of a corporation to the corporation or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of Delaware corporate law or obtained an improper personal benefit. Our restated certificate of incorporation provides that no director of the Registrant shall be personally liable to it or its stockholders for monetary damages for any breach of fiduciary duty as a director, notwithstanding any provision of law imposing such liability, except to the extent that the General Corporation Law of the State of Delaware prohibits the elimination or limitation of liability of directors for breaches of fiduciary duty.

Section 145 of the General Corporation Law of the State of Delaware provides that a corporation has the power to indemnify a director, officer, employee, or agent of the corporation, or a person serving at the request of the corporation for another corporation, partnership, joint venture, trust or other enterprise in related capacities against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with an action, suit or proceeding to which he was or is a party or is threatened to be made a party to any threatened, ending or completed action, suit or proceeding by reason of such position, if such person acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, in any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful, except that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of

all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Our restated certificate of incorporation provides that we will indemnify each person who was or is a party or threatened to be made a party to any threatened, pending or completed action, suit or proceeding (other than an action by or in the right of us) by reason of the fact that he or she is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (all such persons being referred to as an “Indemnitee”), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys’ fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding and any appeal therefrom, if such Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, and, with respect to any criminal action or proceeding, he or she had no reasonable cause to believe his or her conduct was unlawful. Our restated certificate of incorporation provides that we will indemnify any Indemnitee who was or is a party to an action or suit by or in the right of us to procure a judgment in our favour by reason of the fact that the Indemnitee is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise, or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys’ fees) and, to the extent permitted by law, amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding, and any appeal therefrom, if the Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, except that no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to us, unless a court determines that, despite such adjudication but in view of all of the circumstances, he or she is entitled to indemnification of such expenses. Notwithstanding the foregoing, to the extent that any Indemnitee has been successful, on the merits or otherwise, he or she will be indemnified by us against all expenses (including attorneys’ fees) actually and reasonably incurred in connection therewith. Expenses must be advanced to an Indemnitee under certain circumstances.

We intend to enter into indemnification agreements with each of our directors and officers. These indemnification agreements may require us, among other things, to indemnify our directors and officers for some expenses, including attorneys’ fees, judgments, fines and settlement amounts incurred by a director or officer in any action or proceeding arising out of his or her service as one of our directors or officers, or any of our subsidiaries or any other company or enterprise to which the person provides services at our request.

We maintain a general liability insurance policy that covers certain liabilities of directors and officers of our corporation arising out of claims based on acts or omissions in their capacities as directors or officers.

In any underwriting agreement we enter into in connection with the sale of common stock being registered hereby, the underwriters will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us within the meaning of the Securities Act of 1933, as amended , or the Securities Act, against certain liabilities.

Item 15. Recent Sales of Unregistered Securities.

Set forth below is information regarding shares of capital stock issued by us within the past three years. Also included is the consideration received by us for such shares and information relating to the section of the Securities Act, or rule of the Securities and Exchange Commission, under which exemption from registration was claimed.

(a) Issuance of Capital Stock.

From June 2018 through July 2018, the registrant issued an aggregate of 6,052,617 shares of Series C Preferred Stock for aggregate consideration of approximately $27.6 million to accredited investors, pursuant to Rule 506 as a transaction not involving a public offering.

In May 2020, the registrant issued an aggregate of 15,313,382 shares of Series D Preferred Stock for aggregate consideration of approximately $107.5 million to accredited investors, pursuant to Rule 506 as a transaction not involving a public offering.

In October 2020, the registrant issued an aggregate of 8,973,261 shares of Series D-1 Preferred Stock for aggregate consideration of approximately $107.5 million to accredited investors, pursuant to Rule 506 as a transaction not involving a public offering.

(b) Equity Grants.

From January 1, 2017 through October 9, the registrant granted stock options to purchase an aggregate of 6,615,494 shares of its common stock, with exercise prices ranging from $1.24 to $8.02 per share to employees, directors and consultants in connection with services provided to the registrant by such parties.

Item 16. Exhibits and Financial Statement Schedules.

(a) Exhibits.

Exhibit Number	Description of Exhibit
1.1*	Form of Underwriting Agreement
3.1**	Certificate of Incorporation of the Registrant, as amended (currently in effect)
3.2**	Bylaws of the Registrant, as amended (currently in effect)
3.3*	Form of Restated Certificate of Incorporation of the Registrant (to be effective upon the closing of this offering)
3.4*	Form of Amended and Restated Bylaws of the Registrant (to be effective upon the closing of this offering)
4.1	Fourth Amended and Restated Stockholders Agreement, as amended
4.2**	Specimen Stock Certificate evidencing the shares of common stock
5.1*	Opinion of Latham & Watkins LLP
10.1**	2013 Stock Incentive Plan, as amended, and form of agreements thereunder
10.2*	2020 Incentive Award Plan and form of agreements thereunder
10.3*	2020 Employee Stock Purchase Plan
10.4*	Non-Employee Director Compensation Program
10.5*	Form of Indemnification Agreement for Directors and Officers
10.6**	Lease Agreement between the Registrant and OPG 125 SUMMER OWNER (DE) LLC
10.7**	Consulting Agreement between the Registrant and Danforth Advisors, LLC
10.8†	License Agreement, dated as of October 21, 2020, among the Registrant, F. Hoffman-La Roche Ltd and Genentech, Inc.
21.1**	Subsidiaries of the Registrant
23.1	Consent of KPMG LLP
23.2*	Consent of Latham & Watkins LLP (included in Exhibit 5.1)
24.1**	Power of Attorney (included on signature page)

* To be filed by amendment.
** Previously filed.
† Portions of this exhibit (indicated by asterisks) have been redacted in compliance with Regulation S-K Item 601(b)(10)(iv).

(b) Financial Statement Schedules. Schedules not listed above have been omitted because the information required to be set forth therein is not applicable or is shown in the audited consolidated financial statements or notes thereto.

Item 17. Undertakings.

The undersigned registrant hereby undertakes to provide to the underwriter, at the closing specified in the underwriting agreement, certificates in such denominations and registered in such names as required by the underwriter to permit prompt delivery to each purchaser.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

The undersigned hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act of 1933, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act of 1933, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

SIGNATURES

Pursuant to the requirements of the Securities Act, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Boston, Commonwealth of Massachusetts, on this 22nd day of October, 2020.

ATEA PHARMACEUTICALS, INC.

By: /s/ Jean-Pierre Sommadossi, Ph.D.
Jean-Pierre Sommadossi, Ph.D.
President and Chief Executive Officer

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following persons in the capacities held on the dates indicated.

Signature	Title	Date
/s/Jean-Pierre Sommadossi, Ph.D. Jean-Pierre Sommadossi, Ph.D.	President, Chief Executive Officer and Chairman of the Board of Directors (principal executive officer)	October 22, 2020
/s/ Andrea Corcoran Andrea Corcoran	Chief Financial Officer and Executive Vice President, Legal and Secretary (principal financial officer)	October 22, 2020
/s/ Wayne Foster Wayne Foster	Senior Vice President, Finance and Administration (principal accounting officer)	October 22, 2020
* Franklin Berger	Director	October 22, 2020
* Grigory Borisenko, Ph.D.	Director	October 22, 2020
* Bihua Chen	Director	October 22, 2020
* Isaac Cheng, M.D.	Director	October 22, 2020
* Andrew Hack, M.D., Ph.D.	Director	October 22, 2020
* Bruno Lucidi	Director	October 22, 2020
* Polly A. Murphy, D.V.M., Ph.D.	Director	October 22, 2020
* Bruce Polsky, M.D.	Director	October 22, 2020

*By: /s/ Jean-Pierre Sommadossi, Ph.D.
Attorney-in-fact

ATEA PHARMACEUTICALS, INC.

FOURTH AMENDED AND RESTATED
STOCKHOLDERS AGREEMENT

THIS FOURTH AMENDED AND RESTATED STOCKHOLDERS AGREEMENT (this "**Agreement**"), is made as of May 19, 2020, by and among Atea Pharmaceuticals, Inc., a Delaware corporation (the "**Company**"), the Founder (as defined below), each of the investors listed on Schedule A hereto (together with any subsequent investors or transferees, who become parties hereto as "Investors" pursuant to Subsections 11.9(a) or 11.12 below, the "**Investors**"), and those certain stockholders of the Company listed on Schedule B (together with any subsequent stockholders or transferees, who become parties hereto as "Key Holders" pursuant to Subsection 11.9(b) or 11.12 below, the "**Key Holders**," and together collectively with the Investors, the "**Stockholders**").

RECITALS

WHEREAS, certain of the Investors (the "**Existing Investors**") hold shares of the Company's Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock and/or shares of Common Stock issued upon conversion thereof and possess registration rights, information rights, rights of first offer, and other rights pursuant to the Third Amended and Restated Stockholders Agreement dated as of June 29, 2018, by and among the Company and such Investors (the "**Prior Agreement**"); and

WHEREAS, the Existing Investors constitute the Requisite Preferred Holders (as defined in the Prior Agreement) and the holders of a majority of the outstanding shares of Series C Preferred Stock, and the Company and the Existing Investors desire to amend and restate the Prior Agreement in its entirety and to accept the rights created pursuant to this Agreement in lieu of the rights granted to them under the Prior Agreement in order to induce certain of the Investors to invest funds in the Company pursuant to that certain Preferred Stock Purchase Agreement, of even date herewith, by and among the Company and certain of the Investors (the "**Purchase Agreement**").

NOW, THEREFORE, the parties hereby agree as follows:

1. Definitions. For purposes of this Agreement:

1.1 "**Affiliate**" means, with respect to any specified Person, any other Person who, directly or indirectly, controls, is controlled by, or is under common control with such Person, including without limitation any general partner, managing member, officer or director of such Person or any venture capital, registered investment company or other investment fund now or hereafter existing that is controlled by one or more general partners, managing members or investment advisers of, or shares the same management company or investment adviser with, such Person.

1.2 "**Board**" means the Board of Directors of the Company.

1.3 "**Capital Stock**" means (a) shares of Common Stock and Preferred Stock (whether now outstanding or hereafter issued in any context), (b) shares of Common Stock issued or issuable upon conversion of Preferred Stock, and (c) shares of Common Stock issued or issuable upon exercise or conversion, as applicable, of stock options, warrants or other convertible securities of the Company, in each case now owned or subsequently acquired by any Key Holder, any Investor, or their respective successors or permitted transferees or assigns. For purposes of the number of shares of Capital Stock held by an Investor or Key Holder (or any other calculation based thereon), all shares of Preferred Stock shall be deemed to have been converted into Common Stock at the then-applicable conversion ratio.

1.4 "**Certificate of Incorporation**" means the Company's certificate of incorporation, as it may be amended and/or restated from time to time.

1.5 "**Common Stock**" means shares of the Company's common stock, par value $0.001 per share.

1.6 "**Company Notice**" means written notice from the Company notifying the selling Rights Holder that the Company intends to exercise its Right of First Refusal as to some or all of the Transfer Stock with respect to any Proposed Restricted Holder Transfer.

1.7 "**Competitor**" means a Person engaged, directly or indirectly (including through any partnership, limited liability company, corporation, joint venture or similar arrangement (whether now existing or formed hereafter)), in discovering, developing or commercializing antivirals for the treatment or prophylaxis of human diseases or conditions resulting from infection by or exposure to RNA or DNA viruses, but shall not include any financial investment firm, venture capital firm or collective investment vehicle that, together with its Affiliates, holds less than ten percent (10%) of the outstanding equity of any Competitor and does not, nor do any of its Affiliates, have a right to designate any members of the board of directors of any Competitor. Notwithstanding anything to the contrary in no event shall Ally Bridge Medalpha Master Fund L.P. or any Affiliate thereof, Bain Capital Life Sciences, LP or any Affiliate thereof, RA Capital Healthcare Fund, L.P. or any Affiliate thereof, Redmile Biopharma Investments II, L.P. ("**Redmile**") or any Affiliate thereof or Rock Springs Capital Master Fund LP or any Affiliate thereof constitute a Competitor.

1.8 "**Damages**" means any loss, damage, claim or liability (joint or several) to which a party hereto may become subject under the Securities Act, the Exchange Act, or other federal or state law, insofar as such loss, damage, claim or liability (or any action in respect thereof) arises out of or is based upon: (i) any untrue statement or alleged untrue statement of a material fact contained in any registration statement of the Company, including any preliminary prospectus or final prospectus contained therein or any amendments or supplements thereto; (ii) an omission or alleged omission to state therein a material fact required to be stated therein, or necessary to make the statements therein not misleading; or (iii) any violation or alleged violation by the indemnifying party (or any of its agents or Affiliates) of the Securities Act, the Exchange Act, any state securities law, or any rule or regulation promulgated under the Securities Act, the Exchange Act, or any state securities law.

1.9 "**Deemed Liquidation Event**" shall have the meaning ascribed to it in the Certificate of Incorporation.

1.10 "**Defaulting Investor**" shall have the meaning ascribed to it in the Purchase Agreement.

1.11 "**Derivative Securities**" means any securities or rights convertible into, or exercisable or exchangeable for (in each case, directly or indirectly)**,** Common Stock, including options and warrants.

1.12 "**Exchange Act**" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

1.13 "**Excluded Registration**" means: (i) a registration relating to the sale of securities to employees, consultants and/or members of the Board of the Company or a subsidiary pursuant to a stock option, stock purchase, or similar plan; (ii) a registration relating to an SEC Rule 145 transaction; (iii) a registration on any form that does not include substantially the same information as would be required to be included in a registration statement covering the sale of the Registrable Securities; or (iv) a registration in which the only Common Stock being registered is Common Stock issuable upon conversion of debt securities that are also being registered.

1.14 "**Form S-1**" means such form under the Securities Act as in effect on the date hereof or any successor registration form under the Securities Act subsequently adopted by the SEC.

1.15 "**Form S-3**" means such form under the Securities Act as in effect on the date hereof or any registration form under the Securities Act subsequently adopted by the SEC that permits incorporation of substantial information by reference to other documents filed by the Company with the SEC.

1.16 "**Founder**" means Jean-Pierre Sommadossi, Ph.D.; provided, however, upon the death or total and permanent disability of Jean-Pierre Sommadossi, Ph.D., "Founder" shall mean the Key Holders holding a majority of the outstanding shares of Common Stock held by Key Holders.

1.17 "**Founder Holders**" means (a) Jean-Pierre Sommadossi, Ph.D., (b) any Affiliate of Dr. Sommadossi, (c) the Jean-Pierre Sommadossi Trust 12/10/98 and (d) JPM Partners LLC.

1.18 "**GAAP**" means generally accepted accounting principles in the United States.

1.19 "**Holder**" means any holder of Registrable Securities who is a party to this Agreement.

1.20 "**Immediate Family Member**" means a child, stepchild, grandchild, parent, stepparent, grandparent, spouse, sibling, mother-in-law, father-in-law, son-in-law, daughter-in-law, brother-in-law, or sister-in-law, including, adoptive relationships, of a natural person referred to herein.

1.21 "**Initiating Holders**" means, collectively, Holders who properly initiate a registration request under this Agreement.

1.22 "**IPO**" means the Company's first underwritten public offering of its Common Stock under the Securities Act.

1.23 "**Major Investor**" means any Investor that, individually or together with such Investor's Affiliates, holds at least 400,000 shares of Registrable Securities (as adjusted for any stock split, stock dividend, combination, or other recapitalization or reclassification effected after the date hereof), and is not a Defaulting Investor.

1.24 "**New Securities**" means, collectively, equity securities of the Company, whether or not currently authorized, as well as rights, options, or warrants to purchase such equity securities, or securities of any type whatsoever that are, or may become, convertible or exchangeable into or exercisable for such equity securities.

1.25 "**Person**" means any individual, corporation, partnership, trust, limited liability company, association or other entity.

1.26 "**Preferred Stock**" means, collectively, the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock, Series D Preferred Stock and Series D-1 Preferred Stock.

1.27 "**Proposed Restricted Holder Transfer**" means any assignment, sale, offer to sell, pledge, mortgage, hypothecation, encumbrance, disposition of or any other like transfer or encumbering of any Transfer Stock (or any interest therein) proposed by any of the Restricted Holders.

1.28 "**Proposed Transfer Notice**" means written notice from a Restricted Holder setting forth the terms and conditions of a Proposed Restricted Holder Transfer.

1.29 "**Prospective Transferee**" means any person to whom a Restricted Holder proposes to make a Proposed Restricted Holder Transfer.

1.30 "**Registrable Securities**" means (i) the Common Stock issuable or issued upon conversion of the Preferred Stock; and (ii) any Common Stock issued as (or issuable upon the conversion or exercise of any warrant, right, or other security that is issued as) a dividend or other distribution with respect to, or in exchange for or in replacement of, the shares referenced in clause (i) above; excluding in all cases, however, (A) any Registrable Securities sold by a Person in a transaction in which the applicable rights under this Agreement are not assigned pursuant to Subsection 11.1 and (B) any Common Stock issued upon conversion of Preferred Stock and Common Stock pursuant to the "Special Mandatory Conversion" provisions of the Certificate of Incorporation, and excluding for purposes of Section 2 any shares for which registration rights have terminated pursuant to Subsection 2.12 of this Agreement.

1.31 "**Registrable Securities then Outstanding**" means the number of shares determined by adding the number of shares of outstanding Common Stock that are Registrable Securities and the number of shares of Common Stock issuable (directly or indirectly) pursuant to then exercisable and/or convertible securities that are Registrable Securities.

1.32 "**Requisite Preferred Holders**" means the holders of a majority in voting power of the outstanding shares of Series B Preferred Stock, Series C Preferred Stock, Series D Preferred Stock and Series D-1 Preferred Stock, voting together as a single class.

1.33 "**Restricted Holders**" means the Founder Holders and the Investors; provided, however, upon the death or total and permanent disability of Jean-Pierre Sommadossi, Ph.D., "Restricted Holders" shall not include the Founder Holders.

1.34 "**Restricted Securities**" means the securities of the Company required to be notated with the legend set forth in Subsection 2.11(b) hereof.

1.35 "**Right of Co-Sale**" means the right, but not an obligation, of a Rights Holder to participate in a Proposed Restricted Holder Transfer on the terms and conditions specified in the Proposed Transfer Notice.

1.36 "**Right of First Refusal**" means the right, but not an obligation, of the Company, or its permitted transferees or assigns, to purchase some or all of the Transfer Stock with respect to a Proposed Restricted Holder Transfer, on the terms and conditions specified in the Proposed Transfer Notice.

1.37 "**Rights Holder**" means (i) with respect to a Proposed Restricted Holder Transfer by any Founder Holder, the Investors (who are not Defaulting Investors) and (ii) with respect to a Proposed Restricted Holder Transfer by any Investor, the Founder Holders and each Investor (who is not Defaulting Investor) other than the Investor effecting such Proposed Restricted Holder Transfer.

1.38 "**Rights Holder Notice**" means written notice from a Rights Holder notifying the Company and the selling Restricted Holder that such Rights Holder intends to exercise its Secondary Refusal Right as to a portion of the Transfer Stock with respect to any Proposed Restricted Holder Transfer.

1.39 "**Sale of the Company**" either: (a) a transaction or series of related transactions in which a Person, or a group of related Persons, acquires from stockholders of the Company shares representing more than fifty percent (50%) of the outstanding voting power of the Company (a "**Stock Sale**"); or (b) a transaction that qualifies as a Deemed Liquidation Event.

1.40 "**SEC**" means the Securities and Exchange Commission.

1.41 "**SEC Rule 144**" means Rule 144 promulgated by the SEC under the Securities Act.

1.42 "**SEC Rule 145**" means Rule 145 promulgated by the SEC under the Securities Act.

1.43 "**Secondary Notice**" means written notice from the Company notifying the Rights Holders and the selling Restricted Holder that the Company does not intend to exercise its Right of First Refusal as to all shares of Transfer Stock with respect to any Proposed Restricted Holder Transfer.

1.44 "**Secondary Refusal Right**" means the right, but not an obligation, of each Rights Holder to purchase up to its pro rata portion (based upon the total number of shares of Capital Stock then held by all Rights Holders other than the Rights Holder effecting such Proposed Restricted Holder Transfer) of any Transfer Stock not purchased pursuant to the Right of First Refusal, on the terms and conditions specified in the Proposed Transfer Notice.

1.45 "**Securities Act**" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

1.46 "**Selling Expenses**" means all underwriting discounts, selling commissions, and stock transfer taxes applicable to the sale of Registrable Securities, and fees and disbursements of counsel for any Holder, except for the fees and disbursements of the Selling Holder Counsel borne and paid by the Company as provided in Subsection 2.6.

1.47 "**Series A Preferred Stock**" means shares of the Company's Series A Preferred Stock, par value $0.001 per share.

1.48 "**Series B Preferred Stock**" means shares of the Company's Series B Preferred Stock, par value $0.001 per share.

1.49 "**Series C Preferred Stock**" means shares of the Company's Series C Preferred Stock, par value $0.001 per share.

1.50 "**Series D Preferred Stock**" means shares of the Company's Series D Preferred Stock, par value $0.001 per share.

1.51 "**Series D-1 Preferred Stock**" means shares of the Company's Series D-1 Preferred Stock, par value $0.001 per share.

1.52 "**Shares**" means any securities of the Company the holders of which are entitled to vote for members of the Board, including without limitation, all shares of Common Stock and Preferred Stock, by whatever name called, now owned or subsequently acquired by a Stockholder, however acquired, whether through stock splits, stock dividends, reclassifications, recapitalizations, similar events or otherwise.

1.53 "**Transfer Stock**" means shares of Capital Stock owned by a Restricted Holder, or issued to a Restricted Holder after the date hereof (including, without limitation, in connection with any stock split, stock dividend, recapitalization, reorganization, or the like).

1.54 "**Undersubscription Notice**" means written notice from a Rights Holder notifying the Company and the selling Restricted Holder that such Rights Holder intends to exercise its option to purchase all or any portion of the Transfer Stock not purchased pursuant to the Right of First Refusal or the Secondary Refusal Right.

2. Registration Rights. The Company covenants and agrees as follows:

2.1 Demand Registration.

(a) Form S-1 Demand. If at any time after the earlier of (i) five (5) years after the date of this Agreement or (ii) one hundred eighty (180) days after the effective date of the registration statement for the IPO, the Company receives a request from Holders of a majority of the Registrable Securities then Outstanding that the Company file a Form S-1 registration statement with respect to the Registrable Securities then Outstanding having an anticipated gross aggregate offering price of at least $15 million, then the Company shall (x) within twenty (20) days after the date such request is given, give notice thereof (the "**Demand Notice**") to all Holders other than the Initiating Holders; and (y) as soon as practicable, file a Form S-1 registration statement under the Securities Act covering all Registrable Securities that the Initiating Holders requested to be registered and any additional Registrable Securities requested to be included in such registration by any other Holders, as specified by notice given by each such Holder to the Company within twenty (20) days of the date the Demand Notice is given, and in each case, subject to the limitations of Subsections 2.1(c) and 2.3.

(b) Form S-3 Demand. If at any time when it is eligible to use a Form S-3 registration statement, the Company receives a request from Holders of at least thirty percent (30%) of the Registrable Securities then Outstanding that the Company file a Form S-3 registration statement with respect to outstanding Registrable Securities of such Holders having an anticipated gross aggregate offering price of at least $5 million, then the Company shall (i) within ten (10) days after the date such request is given, give a Demand Notice to all Holders other than the Initiating Holders; and (ii) as soon as practicable, and in any event within forty-five (45) days after the date such request is given by the Initiating Holders, file a Form S-3 registration statement under the Securities Act covering all Registrable Securities requested to be included in such registration by any other Holders, as specified by notice given by each such Holder to the Company within twenty (20) days of the date the Demand Notice is given, and in each case, subject to the limitations of Subsections 2.1(c) and 2.3.

(c) Notwithstanding the foregoing obligations, if the Company furnishes to Holders requesting a registration pursuant to this Subsection 2.1 a certificate signed by the Company's chief executive officer stating that in the good faith judgment of the Board it would be materially detrimental to the Company and its stockholders for such registration statement to either become effective or remain effective for as long as such registration statement otherwise would be required to remain effective, because such action would (i) materially interfere with a significant acquisition, corporate reorganization, or other similar transaction involving the Company, (ii) require premature disclosure of material information that the Company has a bona fide business purpose for preserving as confidential, or (iii) render the Company unable to comply with requirements under the Securities Act or Exchange Act, then the Company shall have the right to defer taking action with respect to such filing, and any time periods with respect to filing or effectiveness thereof shall be tolled correspondingly, for a period of not more than one hundred twenty (120) days after the request of the Initiating Holders is given; provided, however, that the Company may not invoke this right more than twice in any twelve (12) month period.

(d) The Company shall not be obligated to effect, or to take any action to effect, any registration pursuant to Subsection 2.1(a) (i) during the period that is sixty (60) days before the Company's good faith estimate of the date of filing of, and ending on a date that is one hundred eighty (180) days after the effective date of, a Company-initiated registration, provided that the Company is actively employing in good faith commercially reasonable efforts to cause such registration statement to become effective; (ii) after the Company has effected two (2) registrations pursuant to Subsection 2.1(a); or (iii) if the Initiating Holders propose to dispose of shares of Registrable Securities that may be immediately registered on Form S-3 pursuant to a request made pursuant to Subsection 2.1(b). The Company shall not be obligated to effect, or to take any action to effect, any registration pursuant to Subsection 2.1(b) (x) during the period that is thirty (30) days before the Company's good faith estimate of the date of filing of, and ending on a date that is ninety (90) days after the effective date of, a Company-initiated registration, provided that the Company is actively employing in good faith commercially reasonable efforts to cause such registration statement to become effective; or (y) if the Company has effected two registrations pursuant to Subsection 2.1(b) within the twelve (12) month period immediately preceding the date of such request. A registration shall not be counted as "effected" for purposes of this Subsection 2.1(d) until such time as the applicable registration statement has been declared effective by the SEC, unless the Initiating Holders withdraw their request for such registration, elect not to pay the registration expenses therefor, and forfeit their right to one demand registration statement pursuant to Subsection 2.6, in which case such withdrawn registration statement shall be counted as "effected" for purposes of this Subsection 2.1(d).

2.2 Company Registration. If the Company proposes to register (including, for this purpose, a registration effected by the Company for stockholders other than the Holders) any of its Common Stock under the Securities Act in connection with the public offering of such securities solely for cash (other than in the IPO or an Excluded Registration), the Company shall, at such time, promptly give each Holder notice of such registration. Upon the request of each Holder given within twenty (20) days after such notice is given by the Company, the Company shall, subject to the provisions of Subsection 2.3, cause to be registered all of the Registrable Securities that each such Holder has requested to be included in such registration. The Company shall have the right to terminate or withdraw any registration initiated by it under this Subsection 2.2 before the effective date of such registration, whether or not any Holder has elected to include Registrable Securities in such registration. The expenses (other than Selling Expenses) of such withdrawn registration shall be borne by the Company in accordance with Subsection 2.6.

2.3 Underwriting Requirements.

(a) If, pursuant to Subsection 2.1, the Initiating Holders intend to distribute the Registrable Securities covered by their request by means of an underwriting, they shall so advise the Company as a part of their request made pursuant to Subsection 2.1, and the Company shall include such information in the Demand Notice. The underwriter(s) will be selected by the Company and shall be reasonably acceptable to a majority in interest of the Initiating Holders. In such event, the right of any Holder to include such Holder's Registrable Securities in such registration shall be conditioned upon such Holder's participation in such underwriting and the inclusion of such Holder's Registrable Securities in the underwriting to the extent provided herein. All Holders proposing to distribute their securities through such underwriting shall (together with the Company as provided in Subsection 2.4(e)) enter into an underwriting agreement in customary

form with the underwriter(s) selected for such underwriting. Notwithstanding any other provision of this Subsection 2.3, if the underwriter(s) advise(s) the Initiating Holders in writing that marketing factors require a limitation on the number of shares to be underwritten, then the Initiating Holders shall so advise all Holders of Registrable Securities that otherwise would be underwritten pursuant hereto, and the number of Registrable Securities that may be included in the underwriting shall be allocated among such Holders of Registrable Securities, including the Initiating Holders, in proportion (as nearly as practicable) to the number of Registrable Securities owned by each Holder or in such other proportion as shall mutually be agreed to by all such selling Holders; provided, however, that the number of Registrable Securities held by the Holders to be included in such underwriting shall not be reduced unless all other securities are first entirely excluded from the underwriting. To facilitate the allocation of shares in accordance with the above provisions, the Company or the underwriters may round the number of shares allocated to any Holder to the nearest one hundred (100) shares.

(b) In connection with any offering involving an underwriting of shares of the Company's capital stock pursuant to Subsection 2.2, the Company shall not be required to include any of the Holders' Registrable Securities in such underwriting unless the Holders accept the terms of the underwriting as agreed upon between the Company and its underwriters, and then only in such quantity as the underwriters in their sole discretion determine will not jeopardize the success of the offering by the Company. If the total number of securities, including Registrable Securities, requested by stockholders to be included in such offering exceeds the number of securities to be sold (other than by the Company) that the underwriters in their reasonable discretion determine is compatible with the success of the offering, then the Company shall be required to include in the offering only that number of such securities, including Registrable Securities, which the underwriters and the Company in their sole discretion determine will not jeopardize the success of the offering. If the underwriters determine that less than all of the Registrable Securities requested to be registered can be included in such offering, then the Registrable Securities that are included in such offering shall be allocated among the selling Holders in proportion (as nearly as practicable to) the number of Registrable Securities owned by each selling Holder or in such other proportions as shall mutually be agreed to by all such selling Holders. To facilitate the allocation of shares in accordance with the above provisions, the Company or the underwriters may round the number of shares allocated to any Holder to the nearest one hundred (100) shares. Notwithstanding the foregoing, in no event shall (i) the number of Registrable Securities included in the offering be reduced unless all other securities (other than securities to be sold by the Company) are first entirely excluded from the offering, or (ii) the number of Registrable Securities included in the offering be reduced below twenty percent (20%) of the total number of securities included in such offering. For purposes of the provision in this Subsection 2.3(b) concerning apportionment, for any selling Holder that is a partnership, limited liability company, or corporation, the partners, members, retired partners, retired members, stockholders, and Affiliates of such Holder, or the estates and Immediate Family Members of any such partners, retired partners, members, and retired members and any trusts for the benefit of any of the foregoing Persons, shall be deemed to be a single "selling Holder," and any pro rata reduction with respect to such "selling Holder" shall be based upon the aggregate number of Registrable Securities owned by all Persons included in such "selling Holder," as defined in this sentence.

(c) For purposes of Subsection 2.1, a registration shall not be counted as "effected" if, as a result of an exercise of the underwriter's cutback provisions in Subsection 2.3(a), fewer than one hundred percent (100%) of the total number of Registrable Securities that Holders have requested to be included in such registration statement are actually included.

2.4 Obligations of the Company. Whenever required under this Section 2 to effect the registration of any Registrable Securities, the Company shall, as expeditiously as reasonably possible:

(a) prepare and file with the SEC a registration statement with respect to such Registrable Securities and use its commercially reasonable efforts to cause such registration statement to become effective and, upon the request of the Holders of a majority of the Registrable Securities registered thereunder, keep such registration statement effective for a period of up to one hundred twenty (120) days or, if earlier, until the distribution contemplated in the registration statement has been completed; provided, however, that such one hundred twenty (120) day period shall be extended for a period of time equal to the period the Holder refrains, at the request of an underwriter of Common Stock (or other securities) of the Company, from selling any securities included in such registration;

(b) prepare and file with the SEC such amendments and supplements to such registration statement, and the prospectus used in connection with such registration statement, as may be necessary to comply with the Securities Act in order to enable the disposition of all securities covered by such registration statement;

(c) furnish to the selling Holders such numbers of copies of a prospectus, including a preliminary prospectus, as required by the Securities Act, and such other documents as the Holders may reasonably request in order to facilitate their disposition of their Registrable Securities;

(d) use its commercially reasonable efforts to register and qualify the securities covered by such registration statement under such other securities or blue-sky laws of such jurisdictions as shall be reasonably requested by the selling Holders; provided that the Company shall not be required to qualify to do business or to file a general consent to service of process in any such states or jurisdictions, unless the Company is already subject to service in such jurisdiction and except as may be required by the Securities Act;

(e) in the event of any underwritten public offering, enter into and perform its obligations under an underwriting agreement, in usual and customary form, with the underwriter(s) of such offering;

(f) use its commercially reasonable efforts to cause all such Registrable Securities covered by such registration statement to be listed on a national securities exchange or trading system and each securities exchange and trading system (if any) on which similar securities issued by the Company are then listed;

(g) provide a transfer agent and registrar for all Registrable Securities registered pursuant to this Agreement and provide a CUSIP number for all such Registrable Securities, in each case not later than the effective date of such registration;

(h) promptly make available for inspection by the selling Holders, any managing underwriter(s) participating in any disposition pursuant to such registration statement, and any attorney or accountant or other agent retained by any such underwriter or selected by the selling Holders, all financial and other records, pertinent corporate documents, and properties of the Company, and cause the Company's officers, directors, employees, and independent accountants to supply all information reasonably requested by any such seller, underwriter, attorney, accountant, or agent, in each case, as necessary or advisable to verify the accuracy of the information in such registration statement and to conduct appropriate due diligence in connection therewith;

(i) notify each selling Holder, promptly after the Company receives notice thereof, of the time when such registration statement has been declared effective or a supplement to any prospectus forming a part of such registration statement has been filed; and

(j) after such registration statement becomes effective, notify each selling Holder of any request by the SEC that the Company amend or supplement such registration statement or prospectus.

In addition, the Company shall ensure that, at all times after any registration statement covering a public offering of securities of the Company under the Securities Act shall have become effective, its insider trading policy shall provide that the Company's directors may implement a trading program under Rule 10b5-1 of the Exchange Act.

2.5 Furnish Information. It shall be a condition precedent to the obligations of the Company to take any action pursuant to this Section 2 with respect to the Registrable Securities of any selling Holder that such Holder shall furnish to the Company such information regarding itself, the Registrable Securities held by it, and the intended method of disposition of such securities as is reasonably required to effect the registration of such Holder's Registrable Securities.

2.6 Expenses of Registration. All expenses (other than Selling Expenses) incurred in connection with registrations, filings, or qualifications pursuant to Section 2, including all registration, filing, and qualification fees; printers' and accounting fees; fees and disbursements of counsel for the Company; and the reasonable fees and disbursements, not to exceed $20,000, of one (1) counsel for the selling Holders ("**Selling Holder Counsel**"), shall be borne and paid by the Company; provided, however, that the Company shall not be required to pay for any expenses of any registration proceeding begun pursuant to Subsection 2.1 if the registration request is subsequently withdrawn at the request of the Initiating Holders (in which case all selling Holders shall bear such expenses pro rata based upon the number of Registrable Securities that were to be included in the withdrawn registration), unless the Initiating Holders agree to forfeit their right to one (1) registration pursuant to Subsections 2.1(a) or 2.1(b), as the case may be; provided further that if, at the time of such withdrawal, the Holders shall have learned of a material adverse change in the condition, business, or prospects of the Company from that known to the Holders at the time of their request and have withdrawn the request with reasonable promptness after learning of such information then the Holders shall not be required to pay any of such expenses and shall not forfeit their right to one (1) registration pursuant to Subsections 2.1(a) or 2.1(b). All Selling Expenses relating to Registrable Securities registered pursuant to this Section 2 shall be borne and paid by the Holders pro rata on the basis of the number of Registrable Securities registered on their behalf.

2.7 Delay of Registration. No Holder shall have any right to obtain or seek an injunction restraining or otherwise delaying any registration pursuant to this Agreement as the result of any controversy that might arise with respect to the interpretation or implementation of this Section 2.

2.8 Indemnification. If any Registrable Securities are included in a registration statement under this Section 2:

(a) To the extent permitted by law, the Company will indemnify and hold harmless each selling Holder, and the partners, members, officers, directors, and stockholders of each such Holder; legal counsel and accountants for each such Holder; any underwriter (as defined in the Securities Act) for each such Holder; and each Person, if any, who controls such Holder or underwriter within the meaning of the Securities Act or the Exchange Act, against any Damages, and the Company will pay to each such Holder, underwriter, controlling Person, or other aforementioned Person any legal or other expenses reasonably incurred thereby in connection with investigating or defending any claim or proceeding from which Damages may result, as such expenses are incurred; provided, however, that the indemnity agreement contained in this Subsection 2.8(a) shall not apply to amounts paid in settlement of any such claim or proceeding if such settlement is effected without the consent of the Company, which consent shall not be unreasonably withheld, nor shall the Company be liable for any Damages to the extent that they arise out of or are based upon actions or omissions made in reliance upon and in conformity with written information furnished by or on behalf of any such Holder, underwriter, controlling Person, or other aforementioned Person expressly for use in connection with such registration.

(b) To the extent permitted by law, each selling Holder, severally and not jointly, will indemnify and hold harmless the Company, and each of its directors, each of its officers who has signed the registration statement, each Person (if any), who controls the Company within the meaning of the Securities Act, legal counsel and accountants for the Company, any underwriter (as defined in the Securities Act), any other Holder selling securities in such registration statement, and any controlling Person of any such underwriter or other Holder, against any Damages, in each case only to the extent that such Damages arise out of or are based upon actions or omissions made in reliance upon and in conformity with written information furnished by or on behalf of such selling Holder expressly for use in connection with such registration; and each such selling Holder will pay to the Company and each other aforementioned Person any legal or other expenses reasonably incurred thereby in connection with investigating or defending any claim or proceeding from which Damages may result, as such expenses are incurred; provided, however, that the indemnity agreement contained in this Subsection 2.8(b) shall not apply to amounts paid in settlement of any such claim or proceeding if such settlement is effected without the consent of the Holder, which consent shall not be unreasonably withheld; and provided further that in no event shall the aggregate amounts payable by any Holder by way of indemnity or contribution under Subsections 2.8(b) and 2.8(d) exceed the proceeds from the offering received by such Holder (net of any Selling Expenses paid by such Holder), except in the case of fraud or willful misconduct by such Holder.

(c) Promptly after receipt by an indemnified party under this Subsection 2.8 of notice of the commencement of any action (including any governmental action) for which a party may be entitled to indemnification hereunder, such indemnified party will, if a claim in respect thereof is to be made against any indemnifying party under this Subsection 2.8, give the indemnifying party notice of the commencement thereof. The indemnifying party shall have the right to participate in such action and, to the extent the indemnifying party so desires, participate jointly with any other indemnifying party to which notice has been given, and to assume the defense thereof with counsel mutually satisfactory to the parties; provided, however, that an indemnified party (together with all other indemnified parties that may be represented without conflict by one counsel) shall have the right to retain one separate counsel, with the fees and expenses to be paid by the indemnifying party, if representation of such indemnified party by the counsel retained by the indemnifying party would be inappropriate due to actual or potential differing interests between such indemnified party and any other party represented by such counsel in such action. The failure to give notice to the indemnifying party within a reasonable time of the commencement of any such action shall relieve such indemnifying party of any liability to the indemnified party under this Subsection 2.8, to the extent that such failure materially prejudices the indemnifying party's ability to defend such action. The failure to give notice to the indemnifying party will not relieve it of any liability that it may have to any indemnified party otherwise than under this Subsection 2.8.

(d) To provide for just and equitable contribution to joint liability under the Securities Act in any case in which either: (i) any party otherwise entitled to indemnification hereunder makes a claim for indemnification pursuant to this Subsection 2.8 but it is judicially determined (by the entry of a final judgment or decree by a court of competent jurisdiction and the expiration of time to appeal or the denial of the last right of appeal) that such indemnification may not be enforced in such case, notwithstanding the fact that this Subsection 2.8 provides for indemnification in such case, or (ii) contribution under the Securities Act may be required on the part of any party hereto for which indemnification is provided under this Subsection 2.8, then, and in each such case, such parties will contribute to the aggregate losses, claims, damages, liabilities, or expenses to which they may be subject (after contribution from others) in such proportion as is appropriate to reflect the relative fault of each of the indemnifying party and the indemnified party in connection with the statements, omissions, or other actions that resulted in such loss, claim, damage, liability, or expense, as well as to reflect any other relevant equitable considerations. The relative fault of the indemnifying party and of the indemnified party shall be determined by reference to, among other things, whether the untrue or allegedly untrue statement of a material fact, or the omission or alleged omission of a material fact, relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information, and opportunity to correct or prevent such statement or omission; provided, however, that, in any such case (x) no Holder will be required to contribute any amount in excess of the public offering price of all such Registrable Securities offered and sold by such Holder pursuant to such registration statement, and (y) no Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) will be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation; and provided further that in no event shall a Holder's liability pursuant to this Subsection 2.8(d), when combined with the amounts paid or payable by such Holder pursuant to Subsection 2.8(b), exceed the proceeds from the offering received by such Holder (net of any Selling Expenses paid by such Holder), except in the case of willful misconduct or fraud by such Holder.

(e) Unless otherwise superseded by an underwriting agreement entered into in connection with the underwritten public offering, the obligations of the Company and Holders under this Subsection 2.8 shall survive the completion of any offering of Registrable Securities in a registration under this Section 2, and otherwise shall survive the termination of this Agreement.

2.9 Reports Under Exchange Act. With a view to making available to the Holders the benefits of SEC Rule 144 and any other rule or regulation of the SEC that may at any time permit a Holder to sell securities of the Company to the public without registration or pursuant to a registration on Form S-3, the Company shall:

(a) make and keep available adequate current public information, as those terms are understood and defined in SEC Rule 144, at all times after the effective date of the registration statement filed by the Company for the IPO;

(b) use commercially reasonable efforts to file with the SEC in a timely manner all reports and other documents required of the Company under the Securities Act and the Exchange Act (at any time after the Company has become subject to such reporting requirements); and

(c) furnish to any Holder, so long as the Holder owns any Registrable Securities, forthwith upon request (i) to the extent accurate, a written statement by the Company that it has complied with the reporting requirements of SEC Rule 144 (at any time after ninety (90) days after the effective date of the registration statement filed by the Company for the IPO), the Securities Act, and the Exchange Act (at any time after the Company has become subject to such reporting requirements), or that it qualifies as a registrant whose securities may be resold pursuant to Form S-3 (at any time after the Company so qualifies); and (ii) such other information as may be reasonably requested in availing any Holder of any rule or regulation of the SEC that permits the selling of any such securities without registration (at any time after the Company has become subject to the reporting requirements under the Exchange Act) or pursuant to Form S-3 (at any time after the Company so qualifies to use such form).

2.10 "Market Stand-off" Agreement. Each Holder hereby agrees that it will not, without the prior written consent of the managing underwriter, during the period commencing on the date of the final prospectus relating to the IPO, and ending on the date specified by the Company and the managing underwriter (such period not to exceed one hundred eighty (180) days), (i) lend; offer; pledge; sell; contract to sell; sell any option or contract to purchase; purchase any option or contract to sell; grant any option, right, or warrant to purchase; or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock or any securities convertible into or exercisable or exchangeable (directly or indirectly) for Common Stock (in each case, solely with respect to shares or any such securities held as of immediately prior to the IPO) or (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of such securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock or other securities, in cash, or otherwise. The foregoing provisions of this Subsection 2.10 shall apply only to the IPO and shall apply to each Investor only if each officer, director and each stockholder of the Company (together with their Affiliates or related investment funds) owning 1% or more of the Common Stock or any securities convertible into or exercisable or exchangeable (directly or indirectly) for Common Stock are subject to the same restrictions and are bound by similar agreements, shall not apply to: (A) the sale of any shares to an underwriter pursuant to an underwriting agreement, (B) any shares

purchased in the IPO or in open market transactions from and after the IPO, (C) the transfer of any shares owned by a Holder to its affiliates or any of the Holder's stockholders, members, partners or other equity holders; provided that the affiliate, stockholder, member, partner or other equity holder of the Holder agrees to be bound in writing by the restrictions set forth herein, or (D) the transfer of any shares to any trust for the direct or indirect benefit of the Holder or the immediate family of the Holder, provided that the trustee of the trust agrees to be bound in writing by the restrictions set forth herein. The underwriters in connection with such registration are intended third-party beneficiaries of this Subsection 2.10 and shall have the right, power and authority to enforce the provisions hereof as though they were a party hereto. Each Holder further agrees to execute such agreements as may be reasonably requested by the underwriters in connection with such registration that are consistent with this Subsection 2.10 or that are necessary to give further effect thereto. Any discretionary waiver or termination of the restrictions of any or all of such agreements by the Company or the underwriters shall apply pro rata only to all Holders that, together with such Holder's Affiliates, own at least 550,000 shares of Series D Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series D Preferred Stock), based on the number of shares subject to such agreements.

2.11 Restrictions on Transfer.

(a) The Preferred Stock and the Registrable Securities shall not be sold, pledged, or otherwise transferred, and the Company shall not recognize and shall issue stop-transfer instructions to its transfer agent with respect to any such sale, pledge, or transfer, except upon the conditions specified in this Agreement. A transferring Holder will cause any proposed purchaser, pledgee, or transferee of the Preferred Stock and the Registrable Securities held by such Holder to agree to take and hold such securities subject to the provisions and upon the conditions specified in this Agreement. Notwithstanding the foregoing, the Company shall not require any transferee of shares pursuant to an effective registration statement or, following the IPO, SEC Rule 144, in each case, to be bound by the terms of this Agreement.

(b) Each certificate, instrument, or book entry representing (i) the Preferred Stock, (ii) the Registrable Securities, and (iii) any other securities issued in respect of the securities referenced in clauses (i) and (ii), upon any stock split, stock dividend, recapitalization, merger, consolidation, or similar event, shall (unless otherwise permitted by the provisions of Subsection 2.11(c)) be notated with a legend substantially in the following form:

THE SECURITIES REPRESENTED HEREBY HAVE BEEN ACQUIRED FOR INVESTMENT AND HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. SUCH SHARES MAY NOT BE SOLD, PLEDGED, OR TRANSFERRED IN THE ABSENCE OF SUCH REGISTRATION OR A VALID EXEMPTION FROM THE REGISTRATION AND PROSPECTUS DELIVERY REQUIREMENTS OF SAID ACT.

The Holders consent to the Company making a notation in its records and giving instructions to any transfer agent of the Restricted Securities in order to implement the restrictions on transfer set forth in this Subsection 2.11.

(c) The holder of such Restricted Securities, by acceptance of ownership thereof, agrees to comply in all respects with the provisions of this Section 2. Before any proposed sale, pledge, or transfer of any Restricted Securities, unless there is in effect a registration statement under the Securities Act covering the proposed transaction or, following the IPO, the transfer is made pursuant to SEC Rule 144, the Holder thereof shall give notice to the Company of such Holder's intention to effect such sale, pledge, or transfer. Each such notice shall describe the manner and circumstances of the proposed sale, pledge, or transfer in sufficient detail and, if reasonably requested by the Company, shall be accompanied at such Holder's expense by either (i) a written opinion of legal counsel who shall, and whose legal opinion shall, be reasonably satisfactory to the Company, addressed to the Company, to the effect that the proposed transaction may be effected without registration under the Securities Act; (ii) a "no action" letter from the SEC to the effect that the proposed sale, pledge, or transfer of such Restricted Securities without registration will not result in a recommendation by the staff of the SEC that action be taken with respect thereto; or (iii) any other evidence reasonably satisfactory to counsel to the Company to the effect that the proposed sale, pledge, or transfer of the Restricted Securities may be effected without registration under the Securities Act, whereupon the Holder of such Restricted Securities shall be entitled to sell, pledge, or transfer such Restricted Securities in accordance with the terms of the notice given by the Holder to the Company. The Company will not require such a legal opinion or "no action" letter (x) in any transaction in compliance with SEC Rule 144; or (y) in any transaction in which such Holder distributes Restricted Securities to an Affiliate of such Holder for no consideration; provided that, with respect to transfers under the foregoing clause (y), each transferee agrees in writing to be subject to the terms of this Subsection 2.11. Each certificate, instrument, or book entry representing the Restricted Securities transferred as above provided shall be notated with, except if such transfer is made pursuant to SEC Rule 144 or pursuant to an effective registration statement, the appropriate restrictive legend set forth in Subsection 2.11(b), except that such certificate instrument, or book entry shall not be notated with such restrictive legend if, in the opinion of counsel for such Holder and the Company, such legend is not required in order to establish compliance with any provisions of the Securities Act.

2.12 Termination of Registration Rights. The right of any Holder to request registration or inclusion of Registrable Securities in any registration pursuant to Subsections 2.1 or 2.2 shall terminate upon the earliest to occur of:

(a) the closing of a Deemed Liquidation Event;

(b) such time after consummation of the IPO as Rule 144 or another similar exemption under the Securities Act is available for the sale of all of such Holder's shares without limitation during a three-month period without registration; and

(c) the third anniversary of the IPO.

3. Information Rights.

3.1 Delivery of Financial Statements. The Company shall deliver to each Major Investor, provided that the Board has not reasonably determined that such Major Investor is a Competitor:

(a) as soon as practicable, but in any event within one hundred eighty days (180) after the end of the fiscal year of the Company ended December 31, 2019 and within one hundred twenty (120) days after the end of each fiscal year of the Company thereafter (or such later date as may be approved by the Board) (i) a balance sheet as of the end of such year, (ii) statements of income and of cash flows for such year, and (iii) a statement of stockholders' equity as of the end of such year, all prepared in accordance with GAAP;

(b) as soon as practicable, but in any event within sixty (60) days after the end of each of the first three (3) quarters of each fiscal year of the Company (or such later date as may be approved by the Board), unaudited statements of income and cash flows for such fiscal quarter, and an unaudited balance sheet as of the end of such fiscal quarter, all prepared in accordance with GAAP (except that such financial statements may (i) be subject to normal year-end adjustments; and (ii) not contain all notes thereto that may be required in accordance with GAAP); and

(c) If, for any period, the Company has any subsidiary whose accounts are consolidated with those of the Company, then in respect of such period the financial statements delivered pursuant to the foregoing sections shall be the consolidated and consolidating financial statements of the Company and all such consolidated subsidiaries.

Notwithstanding anything else in this Subsection 3.1 to the contrary, the Company may cease providing the information set forth in this Subsection 3.1 during the period starting with the date sixty (60) days before the Company's good-faith estimate of the date of filing of a registration statement if it reasonably concludes it must do so to comply with the SEC rules applicable to such registration statement and related offering; provided that the Company's covenants under this Subsection 3.1 shall be reinstated at such time as the Company is no longer actively employing its commercially reasonable efforts to cause such registration statement to become effective.

3.2 Inspection. The Company shall permit each Major Investor (provided that the Board has not reasonably determined that such Major Investor is a Competitor), at such Major Investor's expense, upon not less than 7 days prior notice, to visit and inspect the Company's properties; examine its books of account and records; and discuss the Company's affairs, finances, and accounts with its officers, during normal business hours of the Company as may be reasonably requested by the Major Investor; provided, however, that the Company shall not be obligated pursuant to this Subsection 3.2 to provide access to any information that (i) it reasonably and in good faith considers to be a trade secret or confidential information (unless covered by an enforceable confidentiality agreement, in form acceptable to the Company) or (ii) upon the advice of counsel, it determines that the disclosure of which would adversely affect the attorney-client privilege between the Company and its counsel.

3.3 Termination of Information Rights. The covenants set forth in Subsection 3.1 and Subsection 3.2 shall terminate and be of no further force or effect (i) immediately before the consummation of the IPO, (ii) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act, or (iii) upon a Deemed Liquidation Event, whichever event occurs first.

3.4 Confidentiality. Each Investor agrees that such Investor will keep confidential and will not disclose, divulge, or use for any purpose (other than to monitor its investment in the Company) any confidential information obtained from the Company pursuant to the terms of this Agreement (including notice of the Company's intention to file a registration statement or any information provided in connection with a request for a waiver under or an amendment of any term of this Agreement), unless such confidential information (a) is known or becomes known to the public in general (other than as a result of a breach of this Subsection 3.4 by such Investor), (b) is or has been independently developed or conceived by the Investor without use of the Company's confidential information, or (c) is or has been made known or disclosed to the Investor by a third party without a breach of any obligation of confidentiality such third party may have to the Company; provided, however, that an Investor may disclose confidential information (i) to its attorneys, accountants, consultants, and other professionals to the extent necessary to obtain their services in connection with monitoring its investment in the Company; (ii) to any prospective purchaser of any Registrable Securities from such Investor, provided that prior to such disclosure such prospective purchaser has agreed to be bound to provisions which are the same or substantially similar to the provisions of this Subsection 3.4 (and further provided such purchaser is not a Competitor); (iii) to any Affiliate, partner, member, stockholder, or wholly owned subsidiary of such Investor in the ordinary course of business, provided that such Investor informs such Person that such information is confidential and directs such Person to maintain the confidentiality of such information; or (iv) as may otherwise be required by law, provided that the Investor promptly notifies the Company of such disclosure and takes reasonable steps to minimize the extent of any such required disclosure.

4. Rights to Future Stock Issuances.

4.1 Right of First Offer. Subject to the terms and conditions of this Subsection 4.1 and applicable securities laws, if the Company proposes to offer or sell any New Securities, the Company shall first offer such New Securities to each Investor who is not a Defaulting Investor. Each such Investor shall be entitled to apportion the right of first offer hereby granted to it in such proportions as it deems appropriate, among itself and its Affiliates (provided such Affiliates are not a Competitor). Defaulting Investors shall not be entitled to any of the rights set forth in this Section 4.1.

(a) The Company shall give notice (the "**Offer Notice**") to each Investor, stating (i) its bona fide intention to offer such New Securities, (ii) the number of such New Securities to be offered, and (iii) the price and terms, if any, upon which it proposes to offer such New Securities.

(b) By notification to the Company within ten (10) days after the Offer Notice is given, each Investor may elect to purchase or otherwise acquire, at the price and on the terms specified in the Offer Notice, up to that portion of such New Securities which equals the proportion that the Common Stock then held by such Investor (including all shares of Common Stock then issuable (directly or indirectly) upon conversion and/or exercise, as applicable, of the Preferred Stock and any other Derivative Securities then held by such Investor) bears to the total Common Stock of the Company then outstanding (assuming full conversion and/or exercise, as applicable, of all Preferred Stock and other Derivative Securities). At the expiration of such ten (10) day period, the Company shall promptly notify each Investor that elects to purchase or acquire all the shares available to it (each, a "**Fully Exercising Investor**") of any other Investor's failure to do likewise. During the five (5) day period commencing after the Company has given such notice,

each Fully Exercising Investor may, by giving notice to the Company, elect to purchase or acquire, in addition to the number of shares specified above, up to that portion of the New Securities for which Investors were entitled to subscribe but that were not subscribed for by the Investors which is equal to the proportion that the Common Stock issued and held, or issuable (directly or indirectly) upon conversion and/or exercise, as applicable, of Preferred Stock and any other Derivative Securities then held, by such Fully Exercising Investor bears to the Common Stock issued and held, or issuable (directly or indirectly) upon conversion and/or exercise, as applicable, of the Preferred Stock and any other Derivative Securities then held, by all Fully Exercising Investors who wish to purchase such unsubscribed shares. The closing of any sale pursuant to this Subsection 4.1(b) shall occur within the later of one hundred and twenty (120) days of the date that the Offer Notice is given and the date of the initial sale of New Securities pursuant to Subsection 4.1(c).

(c) If all New Securities referred to in the Offer Notice are not elected to be purchased or acquired as provided in Subsection 4.1(b), the Company may, during the ninety (90) day period following the expiration of the periods provided in Subsection 4.1(b), offer and sell the remaining unsubscribed portion of such New Securities to any Person or Persons at a price not less than, and upon terms no more favorable to the offeree than, those specified in the Offer Notice. If the Company does not enter into an agreement for the sale of the New Securities within such period, or if such agreement is not consummated within thirty (30) days of the execution thereof, the right provided hereunder shall be deemed to be revived and such New Securities shall not be offered unless first reoffered to the Investors in accordance with this Subsection 4.1.

(d) The right of first offer in this Subsection 4.1 shall not be applicable to (i) Exempted Securities (as defined in the Certificate of Incorporation); (ii) shares of Common Stock issued in the IPO; and (iii) the issuance of shares of Preferred Stock pursuant to the Purchase Agreement.

(e) Notwithstanding any provision hereof to the contrary, in lieu of complying with the provisions of this Subsection 4.1, the Company may elect to give notice to the Investors within thirty (30) days after the issuance of New Securities. Such notice shall describe the type, price, and terms of the New Securities. Each Investor shall have twenty (20) days from the date notice is given to elect to purchase up to the number of New Securities that would, if purchased by such Investor, maintain such Investor's percentage-ownership position, calculated as set forth in Subsection 4.1(b) before giving effect to the issuance of such New Securities. The closing of such sale shall occur within sixty (60) days of the date notice is given to the Investors.

4.2 Termination. The covenants set forth in Subsection 4.1 shall terminate and be of no further force or effect (i) immediately before the consummation of the IPO, (ii) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act, or (iii) upon a Deemed Liquidation Event, whichever event occurs first.

5. Voting Provisions Regarding Board of Directors.

5.1 Size of the Board. Each Stockholder agrees to vote, or cause to be voted, all Shares owned by such Stockholder, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that the size of the Board shall be set and remain at nine (9) directors and may be increased only with the written consent of the Founder Holders and the Requisite Preferred Holders.

5.2 Board Composition. Each Stockholder agrees to vote, or cause to be voted, all Shares owned by such Stockholder, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that at each annual or special meeting of stockholders at which an election of directors is held or pursuant to any written consent of the stockholders, the following persons shall be elected to the Board:

(a) one person designated by the Investor holding the greatest number of shares of Series A Preferred Stock held by any of the Investors, other than RMI Investments S.A.R.L. or any of its Affiliates (the "**Series A Designee**"), who shall be the Series A Director (as defined in the Certificate of Incorporation), which individual shall initially be Isaac Cheng, for so long as at least 5,000,000 shares of Series A Preferred Stock are issued and outstanding (which number is subject to appropriate adjustment for all stock splits, dividends, combinations, recapitalizations and the like);

(b) one person designated by RMI Investments S.A.R.L. (the "**RMI Designee**"), which individual shall initially be Grigory Borisenko, for so long as such Stockholder and its Affiliates collectively continue to beneficially own at least 1,500,000 shares of Series A Preferred Stock (which number is subject to appropriate adjustment for all stock splits, dividends, combinations, recapitalizations and the like);

(c) one person designated by AJU Growth & Healthcare Fund (the "**Series B Designee**"), who shall be the Series B Director (as defined in the Certificate of Incorporation), which seat shall initially be vacant, for so long as (i) such Stockholder and its Affiliates collectively continue to beneficially own at least 300,000 shares of Series B Preferred Stock (which number is subject to appropriate adjustment for all stock splits, dividends, combinations, recapitalizations and the like) and (ii) at least 5,000,000 shares of Series B Preferred Stock are issued and outstanding (which number is subject to appropriate adjustment for all stock splits, dividends, combinations, recapitalizations and the like);

(d) one person designated by Cormorant Private Healthcare Fund I, LP (the "**Cormorant Designee**"), who shall be the Series C Director (as defined in the Certificate of Incorporation), which individual shall initially be Bihua Chen, for so long as (i) such Stockholder and its Affiliates collectively continue to beneficially own at least 1,100,000 shares of Series C Preferred Stock (which number is subject to appropriate adjustment for all stock splits, dividends, combinations, recapitalizations and the like) and (ii) at least 2,741,228 shares of Series C Preferred Stock are issued and outstanding (which number is subject to appropriate adjustment for all stock splits, dividends, combinations, recapitalizations and the like);

(e) one person designated by Bain Capital Life Sciences, LP (the "**Bain Designee**"), who shall be the Series D Director (as defined in the Certificate of Incorporation), which individual shall initially be Andrew Hack, for so long as such Stockholder and its Affiliates collectively continue to beneficially own at least 1,500,000 shares of Series D Preferred Stock (which number is subject to appropriate adjustment for all stock splits, dividends, combinations, recapitalizations and the like);

(f) One person designated by the holders of a majority of the outstanding shares of Common Stock held by the Key Holders (the "**Key Holder Designee**"), who shall be the director elected by the holders of record of the shares of Common Stock, exclusively and as a separate class, under the Certificate of Incorporation, which individual shall initially be Jean-Pierre Sommadossi, Ph.D.; and

(g) Three (3) persons who are each not otherwise an Affiliate of the Company or of any Stockholder and who are mutually acceptable to (i) the Founder and (ii) the holders of a majority in voting power of the outstanding shares of Preferred Stock (the "**Independent Designees**"), who shall initially be Franklin Berger, Bruce Polsky and Bruno Lucidi.

To the extent that any of clauses (a) through (f) above shall not be applicable, any member of the Board who would otherwise have been designated in accordance with the terms thereof shall instead be voted upon by all the stockholders of the Company entitled to vote thereon in accordance with, and pursuant to, the Certificate of Incorporation.

5.3 Failure to Designate a Board Member. In the absence of any designation from the Persons or groups with the right to designate a director as specified above, the director previously designated by them and then serving shall be reelected if still eligible to serve as provided herein.

5.4 Removal of Board Members. Each Stockholder also agrees to vote, or cause to be voted, all Shares owned by such Stockholder, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that:

(a) no director elected pursuant to Subsections 5.2 or 5.3 of this Agreement may be removed from office unless (i) such removal is directed or approved by the affirmative vote of the Person, or of the holders of a majority of the shares of stock, entitled under Subsection 5.2 to designate that director; or (ii) the Person(s) originally entitled to designate or approve such director pursuant to Subsection 5.2 is no longer so entitled to designate or approve such director;

(b) any vacancies created by the resignation, removal or death of a director elected pursuant to Subsections 5.2 or 5.3 shall be filled pursuant to the provisions of this Section 5; and

(c) upon the request of any party entitled to designate a director as provided in Subsection 5.2(a), Subsection 5.2(b), Subsection 5.2(c), Subsection 5.2(d), Subsection 5.2(e) or Subsection 5.2(f) to remove such director, such director shall be removed.

All Stockholders agree to execute any written consents required to perform the obligations of this Agreement, and the Company agrees at the request of any party entitled to designate directors to call a special meeting of stockholders for the purpose of electing directors.

5.5 No Liability for Election of Recommended Directors. No Stockholder, nor any Affiliate of any Stockholder, shall have any liability as a result of designating a person for election as a director for any act or omission by such designated person in his or her capacity as a director of the Company, nor shall any Stockholder have any liability as a result of voting for any such designee in accordance with the provisions of this Agreement

5.6 No "Bad Actor" Designees. Each Person with the right to designate or participate in the designation of a director as specified above hereby represents and warrants to the Company that, to such Person's knowledge, none of the "bad actor" disqualifying events described in Rule 506(d)(1)(i)-(viii) promulgated under the Securities Act (each, a "**Disqualification Event**"), is applicable to such Person's initial designee named above except, if applicable, for a Disqualification Event as to which Rule 506(d)(2)(ii) or (iii) or (d)(3) is applicable. Any director designee to whom any Disqualification Event is applicable, except for a Disqualification Event as to which Rule 506(d)(2)(ii) or (iii) or (d)(3) is applicable, is hereinafter referred to as a "**Disqualified Designee**". Each Person with the right to designate or participate in the designation of a director as specified above hereby covenants and agrees (A) not to designate or participate in the designation of any director designee who, to such Person's knowledge, is a Disqualified Designee and (B) that in the event such Person becomes aware that any individual previously designated by any such Person is or has become a Disqualified Designee, such Person shall as promptly as practicable take such actions as are necessary to remove such Disqualified Designee from the Board and designate a replacement designee who is not a Disqualified Designee.

6. Vote to Increase Authorized Common Stock. Each Stockholder agrees to vote or cause to be voted all Shares owned by such Stockholder, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to increase the number of authorized shares of Common Stock from time to time to ensure that there will be sufficient shares of Common Stock available for conversion of all of the shares of Preferred Stock outstanding at any given time.

7. Drag-Along Right.

7.1 Actions to be Taken. In the event that (i) the Requisite Preferred Holders (the "**Selling Investors**"); (ii) the Board; (iii) the Founder Holders; (iv) if the amount per share payable in respect of outstanding shares of Series D Preferred Stock in connection with such Sale of the Company is less than twice the Series D Original Issue Price (as defined in the Certificate of Incorporation), the holders of a majority of the outstanding Series D Preferred Stock; and (v) if the amount per share payable in respect of outstanding shares of Series D-1 Preferred Stock in connection with such Sale of the Company is less than twice the Series D-1 Original Issue Price (as defined in the Certificate of Incorporation), the holders of a majority of the outstanding Series D-1 Preferred Stock approve a Sale of the Company in writing, specifying that this Section 7 shall apply to such transaction, then each Stockholder and the Company hereby agree:

(a) if such transaction requires stockholder approval, with respect to all Shares that such Stockholder owns or over which such Stockholder otherwise exercises voting power, to vote (in person, by proxy or by action by written consent, as applicable) all Shares in favor of, and adopt, such Sale of the Company (together with any related amendment to the Restated Certificate required in order to implement such Sale of the Company) and to vote in opposition to any and all other proposals that could reasonably be expected to delay or impair the ability of the Company to consummate such Sale of the Company;

(b) if such transaction is a Stock Sale, to sell the same proportion of shares of capital stock of the Company beneficially held by such Stockholder as is being sold by the Selling Investors to the Person to whom the Selling Investors propose to sell their Shares, and, except as permitted in Subsection 7.2 below, on the same terms and conditions as the Selling Investors;

(c) to execute and deliver all related documentation and take such other action in support of the Sale of the Company as shall reasonably be requested by the Company or the Selling Investors in order to carry out the terms and provision of this Section 7, including, without limitation, executing and delivering instruments of conveyance and transfer, and any purchase agreement, merger agreement, indemnity agreement, escrow agreement, consent, waiver, governmental filing, share certificates duly endorsed for transfer (free and clear of impermissible liens, claims and encumbrances), and any similar or related documents;

(d) not to deposit, and to cause their Affiliates not to deposit, except as provided in this Agreement, any Shares of the Company owned by such party or Affiliate in a voting trust or subject any Shares to any arrangement or agreement with respect to the voting of such Shares, unless specifically requested to do so by the acquiror in connection with the Sale of the Company;

(e) to refrain from exercising any dissenters' rights or rights of appraisal under applicable law at any time with respect to such Sale of the Company;

(f) if the consideration to be paid in exchange for the Shares pursuant to this Section 7 includes any securities and due receipt thereof by any Stockholder would require under applicable law: (x) the registration or qualification of such securities or of any person as a broker or dealer or agent with respect to such securities; or (y) the provision to any Stockholder of any information other than such information as a prudent issuer would generally furnish in an offering made solely to "accredited investors" as defined in Regulation D promulgated under the Securities Act the Company may cause to be paid to any such Stockholder in lieu thereof, against surrender of the Shares which would have otherwise been sold by such Stockholder, an amount in cash equal to the fair value (as determined in good faith by the Company) of the securities which such Stockholder would otherwise receive as of the date of the issuance of such securities in exchange for the Shares; and

(g) in the event that the Selling Investors, in connection with such Sale of the Company, appoint a stockholder representative (the "**Stockholder Representative**") with respect to matters affecting the Stockholders under the applicable definitive transaction agreements following consummation of such Sale of the Company, (x) to consent to (i) the appointment of such Stockholder Representative, (ii) the establishment of any applicable escrow, expense or similar fund in connection with any indemnification or similar obligations, and (iii) the payment of such Stockholder's pro rata portion (from the applicable escrow or expense fund or otherwise) of any and all reasonable fees and expenses to such Stockholder Representative in connection with such Stockholder Representative's services and duties in connection with such Sale of the Company and its related service as the representative of the Stockholders, and (y) not to assert any claim or commence any suit against the Stockholder Representative or any other Stockholder with respect to any action or inaction taken or failed to be taken by the Stockholder Representative in connection with its service as the Stockholder Representative, absent fraud or willful misconduct.

7.2 Exceptions. Notwithstanding the foregoing, a Stockholder will not be required to comply with Subsection 7.1 above in connection with any proposed Sale of the Company (the "**Proposed Sale**"), unless:

(a) any representations and warranties to be made by such Stockholder in connection with the Proposed Sale are limited to representations and warranties related to authority, ownership and the ability to convey title to such Shares, including, but not limited to, representations and warranties that (i) the Stockholder holds all right, title and interest in and to the Shares such Stockholder purports to hold, free and clear of all liens and encumbrances, (ii) the obligations of the Stockholder in connection with the transaction have been duly authorized, if applicable, (iii) the documents to be entered into by the Stockholder have been duly executed by the Stockholder and delivered to the acquirer and are enforceable against the Stockholder in accordance with their respective terms; and (iv) neither the execution and delivery of documents to be entered into in connection with the transaction, nor the performance of the Stockholder's obligations thereunder, will cause a breach or violation of the terms of any agreement, law or judgment, order or decree of any court or governmental agency;

(b) the Stockholder shall not be liable for the inaccuracy of any representation or warranty made by any other Person in connection with the Proposed Sale, other than the Company (except to the extent that funds may be paid out of an escrow established to cover breach of representations, warranties and covenants of the Company as well as breach by any stockholder of any of identical representations, warranties and covenants provided by all stockholders);

(c) the liability for indemnification, if any, of such Stockholder in the Proposed Sale and for the inaccuracy of any representations and warranties made by the Company or its Stockholders in connection with such Proposed Sale, is several and not joint with any other Person (except to the extent that funds may be paid out of an escrow established to cover breach of representations, warranties and covenants of the Company as well as breach by any stockholder of any of identical representations, warranties and covenants provided by all stockholders), and subject to the provisions of the Certificate of Incorporation related to the allocation of the escrow, is pro rata in proportion to, and does not exceed, the amount of consideration paid to such Stockholder in connection with such Proposed Sale;

(d) upon the consummation of the Proposed Sale (i) each holder of each class or series of the Company's stock will receive the same form of consideration for their shares of such class or series as is received by other holders in respect of their shares of such same class or series of stock, (ii) each holder of Common Stock will receive the same amount of consideration per share of Common Stock as is received by other holders in respect of their shares of Common Stock, and (iii) unless (A) the Requisite Preferred Holders and (B) the holders of a majority in voting power of the then outstanding shares of Series D Preferred Stock and Series D-1 Preferred Stock, voting separately as a class, elect to receive a lesser amount by written notice given to the Company at least three (3) days prior to the effective date of any such Proposed Sale, the aggregate consideration receivable by all holders of the Preferred Stock and Common Stock shall be allocated among the holders of Preferred Stock and Common Stock on the basis of the relative liquidation preferences to which the holders of each respective series of Preferred Stock and the holders of Common Stock are entitled in a Deemed Liquidation Event (assuming for this purpose that the Proposed Sale is a Deemed Liquidation Event) in accordance with the Company's

Certificate of Incorporation in effect immediately prior to the Proposed Sale; provided, however, that, notwithstanding the foregoing, if the consideration to be paid in exchange for the Key Holder Shares or Investor Shares, as applicable, pursuant to this Subsection 7.2(d) includes any securities and due receipt thereof by any Key Holder or Investor would require under applicable law (x) the registration or qualification of such securities or of any person as a broker or dealer or agent with respect to such securities; or (y) the provision to any Key Holder or Investor of any information other than such information as a prudent issuer would generally furnish in an offering made solely to "accredited investors" as defined in Regulation D promulgated under the Securities Act, the Company may cause to be paid to any such Key Holder or Investor in lieu thereof, against surrender of the Key Holder Shares or Investor Shares, as applicable, which would have otherwise been sold by such Key Holder or Investor, an amount in cash equal to the fair value (as determined in good faith by the Company) of the securities which such Key Holder or Investor would otherwise receive as of the date of the issuance of such securities in exchange for the Key Holder Shares or Investor Shares, as applicable; and

(e) no Stockholder that is a venture capital fund, investment fund or similar investment vehicle shall be required, in connection with such Proposed Sale, to enter into any agreements with non-competition, non-solicitation, non-hire provisions or similar restrictive covenants (other than customary covenants regarding confidentiality).

8. Additional Covenants.

8.1 Insurance. The Company shall use its commercially reasonable efforts to maintain, from financially sound and reputable insurers Directors and Officers liability insurance in an amount and on terms and conditions satisfactory to the Board and will use commercially reasonable efforts to cause such insurance policies to be maintained until such time as the Board determines that such insurance should be discontinued.

8.2 Board Matters. The Company shall reimburse the Key Holder Designee and Independent Designees for all reasonable out-of-pocket travel expenses incurred (consistent with the Company's travel policy) in connection with attending meetings of the Board. The Company may reimburse any other director for all reasonable out-of-pocket travel expenses incurred (consistent with the Company's travel policy) in connection with attending meetings of the Board; provided, however, if the Company decides to reimburse such expenses incurred by any of the Series B Designee, Series A Designee, RMI Designee, Cormorant Designee or Bain Designee, then the Company shall reimburse such expenses of each of the Series B Designee, Series A Designee, RMI Designee, Cormorant Designee and Bain Designee.

8.3 Equity Incentive Plan. So long as holders of Series A Preferred Stock are entitled to elect the Series A Director (as defined in the Certificate of Incorporation), holders of Series B Preferred Stock are entitled to elect the Series B Director (as defined in the Certificate of Incorporation), holders of Series C Preferred Stock are entitled to elect the Series C Director (as defined in the Certificate of Incorporation) and holders of Series D Preferred Stock are entitled to elect the Series D Director (as defined in the Certificate of Incorporation), the Company hereby covenants and agrees with each of the Investors that it shall not, without approval of the Board, which approval must include the affirmative vote of at least two out of the four of (i) the Series A Director, (ii) the Series B Director, (iii) the Series C Director and (iv) the Series D Director (the

"**Special Board Approval**"), amend the Company's 2013 Equity Incentive Plan (the "**Plan**") to increase the aggregate number of shares of Common Stock issuable pursuant to the Plan to in excess of 10,979,971 shares of Common Stock, or approve or adopt any other stock option or equity compensation plan.

8.4 Proprietary Information and Inventions Agreements. Unless otherwise approved by the Board, including the Special Board Approval, the Company shall require all employees and consultants to enter into the Company's standard form of proprietary information and inventions agreement or a different agreement containing substantially similar terms with respect to proprietary information and the assignment of inventions.

8.5 Successor Indemnification. If the Company or any of its successors or assignees consolidates with or merges into any other Person and is not the continuing or surviving corporation or entity of such consolidation or merger, then to the extent necessary, proper provision shall be made so that the successors and assignees of the Company assume the obligations of the Company with respect to indemnification of members of the Board of Directors as in effect immediately before such transaction, whether such obligations are contained in the Company's Bylaws, the Certificate of Incorporation, or elsewhere, as the case may be.

8.6 Indemnification Matters. The Company hereby acknowledges that one (1) or more of the directors nominated to serve on the Board of Directors by the Investors (each an "**Investor Director**") may have certain rights to indemnification, advancement of expenses and/or insurance provided by one or more of the Investors and certain of their Affiliates (collectively, the "**Investor Indemnitors**"). The Company hereby agrees (a) that it is the indemnitor of first resort (i.e., its obligations to any such Investor Director are primary and any obligation of the Investor Indemnitors to advance expenses or to provide indemnification for the same expenses or liabilities incurred by such Investor Director are secondary), (b) that it shall be required to advance the full amount of expenses incurred by such Investor Director and shall be liable for the full amount of all expenses, judgments, penalties, fines and amounts paid in settlement by or on behalf of any such Investor Director to the extent legally permitted and as required by the Company's Certificate of Incorporation or Bylaws of the Company (or any agreement between the Company and such Investor Director), without regard to any rights such Investor Director may have against the Investor Indemnitors, and, (c) that it irrevocably waives, relinquishes and releases the Investor Indemnitors from any and all claims against the Investor Indemnitors for contribution, subrogation or any other recovery of any kind in respect thereof. The Company further agrees that no advancement or payment by the Investor Indemnitors on behalf of any such Investor Director with respect to any claim for which such Investor Director has sought indemnification from the Company shall affect the foregoing and the Investor Indemnitors shall have a right of contribution and/or be subrogated to the extent of such advancement or payment to all of the rights of recovery of such Investor Director against the Company. The Investor Directors and the Investor Indemnitors are intended third party beneficiaries of this Subsection 8.6 and shall have the right, power and authority to enforce the provisions of this Subsection 8.6 as though they were a party to this Agreement.

8.7 Right to Conduct Activities. The Company hereby agrees and acknowledges that each of Ally Bridge MedAlpha Master Fund L.P. (together with its Affiliates), Bain Capital Life Sciences, LP (together with its Affiliates), Omega Fund VI, L.P. (together with its Affiliates), RA Capital Healthcare Fund, L.P. (together with its Affiliates), Redmile (together with its Affiliates) and Rock Springs Capital Master Fund LP (together with its Affiliates) is a professional investment organization, and as such reviews the business plans and related proprietary information of many enterprises, some of which may compete directly or indirectly with the Company's business (as currently conducted or as currently propose to be conducted). The Company hereby agrees that, to the extent permitted under applicable law, each of Ally Bridge MedAlpha Master Fund L.P. (and its Affiliates), Bain Capital Life Sciences, LP (and its Affiliates), Omega Fund VI, L.P. (and its Affiliates), RA Capital Healthcare Fund, L.P. (and its Affiliates), Redmile (and its Affiliates) and Rock Springs Capital Master Fund LP (and its Affiliates) shall not be liable to the Company for any claim arising out of, or based upon, (i) the investment by Ally Bridge MedAlpha Master Fund L.P. (or its Affiliates), Bain Capital Life Sciences, LP (or its Affiliates), Omega Fund VI, L.P. (or its Affiliates), RA Capital Healthcare Fund, L.P. (or its Affiliates), Redmile (or its Affiliates) or Rock Springs Capital Master Fund LP (or its Affiliates), respectively, in any entity competitive with the Company, or (ii) actions taken by any partner, officer, employee or other representative of Ally Bridge MedAlpha Master Fund L.P. (or its Affiliates), Bain Capital Life Sciences, LP (or its Affiliates), Omega Fund VI, L.P. (or its Affiliates), RA Capital Healthcare Fund, L.P. (or its Affiliates), Redmile (or its Affiliates) or Rock Springs Capital Master Fund LP (or its Affiliates), respectively, to assist any such competitive company, whether or not such action was taken as a member of the board of directors of such competitive company or otherwise, and whether or not such action has a detrimental effect on the Company; provided, however, that the foregoing shall not relieve (x) any of the Investors from liability associated with the unauthorized disclosure of the Company's confidential information obtained pursuant to this Agreement, or (y) any director or officer of the Company from any liability associated with his or her fiduciary duties to the Company.

9. Agreement Among the Company, the Investors and the Founder.

9.1 Right of First Refusal.

(a) Grant. Subject to the terms of Section 10 below, each Restricted Holder hereby unconditionally and irrevocably grants to the Company, a Right of First Refusal to purchase all or any portion of Transfer Stock that such Restricted Holder may propose to transfer in a Proposed Restricted Holder Transfer, at the same price and on the same terms and conditions as those offered to the Prospective Transferee.

(b) Notice. Each Restricted Holder proposing to make a Proposed Restricted Holder Transfer must deliver a Proposed Transfer Notice to the Company and each Rights Holder not later than forty-five (45) days prior to the consummation of such Proposed Restricted Holder Transfer. Such Proposed Transfer Notice shall contain the material terms and conditions (including price and form of consideration) of the Proposed Restricted Holder Transfer, the identity of the Prospective Transferee and the intended date of the Proposed Restricted Holder Transfer. To exercise its Right of First Refusal under this Section 9, the Company must deliver a Company Notice to the selling Restricted Holder within fifteen (15) days after receipt of the Proposed Transfer Notice. In the event of a conflict between this Agreement and any other agreement that may have been entered into by a Restricted Holder with the Company that contains a preexisting right of first refusal, the Company and the Restricted Holder acknowledge and agree that the terms of this Agreement shall control and the preexisting right of first refusal shall be deemed satisfied by compliance with Subsection 9.1(a) and this Subsection 9.1(b).

(c) Grant of Secondary Refusal Right. Subject to the terms of Section 10 below, each Restricted Holder hereby unconditionally and irrevocably grants to the Rights Holders a Secondary Refusal Right to purchase all or any portion of the Transfer Stock not purchased by the Company pursuant to the Right of First Refusal, as provided in this Subsection 9.1(c). If the Company does not intend to exercise its Right of First Refusal with respect to all Transfer Stock subject to a Proposed Restricted Holder Transfer, the Company must deliver a Secondary Notice to the selling Restricted Holder and to each Rights Holder to that effect no later than fifteen (15) days after the selling Restricted Holder delivers the Proposed Transfer Notice to the Company. To exercise its Secondary Refusal Right, a Rights Holder must deliver a Rights Holder Notice to the selling Restricted Holder and the Company within ten (10) days after the Company's deadline for its delivery of the Secondary Notice as provided in the preceding sentence.

(d) Undersubscription of Transfer Stock. If options to purchase have been exercised by the Company and the Rights Holders with respect to some but not all of the Transfer Stock by the end of the ten (10) day period specified in the last sentence of Subsection 9.1(c) (the "**Rights Holder Notice Period**"), then the Company shall, immediately after the expiration of the Rights Holder Notice Period, send written notice (the "**Company Undersubscription Notice**") to those Rights Holders who fully exercised their Secondary Refusal Right within the Rights Holder Notice Period (the "**Exercising Rights Holders**"). Each Exercising Rights Holder shall, subject to the provisions of this Subsection 9.1(d), have an additional option to purchase all or any part of the balance of any such remaining unsubscribed shares of Transfer Stock on the terms and conditions set forth in the Proposed Transfer Notice. To exercise such option, an Exercising Rights Holder must deliver an Undersubscription Notice to the selling Restricted Holder and the Company within ten (10) days after the expiration of the Rights Holder Notice Period. In the event there are two (2) or more such Exercising Rights Holders that choose to exercise the last-mentioned option for a total number of remaining shares in excess of the number available, the remaining shares available for purchase under this Subsection 9.1(d) shall be allocated to such Exercising Rights Holders pro rata based on the number of shares of Transfer Stock such Exercising Rights Holders have elected to purchase pursuant to the Secondary Refusal Right (without giving effect to any shares of Transfer Stock that any such Exercising Rights Holder has elected to purchase pursuant to the Company Undersubscription Notice). If the options to purchase the remaining shares are exercised in full by the Exercising Rights Holders, the Company shall immediately notify all of the Exercising Rights Holders and the selling Restricted Holder of that fact.

(e) Forfeiture of Rights. Notwithstanding the foregoing, if the total number of shares of Transfer Stock that the Company and the Rights Holders have agreed to purchase in the Company Notice, Rights Holder Notices and Undersubscription Notices is less than the total number of shares of Transfer Stock, then the Company and the Rights Holders shall be deemed to have forfeited any right to purchase such Transfer Stock, and the selling Restricted Holder shall be free to sell all, but not less than all, of the Transfer Stock to the Prospective Transferee on terms and conditions substantially similar to (and in no event more favorable than) the terms and conditions set forth in the Proposed Transfer Notice, it being understood and agreed that (i) any such sale or transfer shall be subject to the other terms and restrictions of this Agreement, including, without limitation, the terms and restrictions set forth in Subsections 9.2 and 11.1; (ii)

any future Proposed Restricted Holder Transfer shall remain subject to the terms and conditions of this Agreement, including this Section 9; and (iii) such sale shall be consummated within sixty (60) days after receipt of the Proposed Transfer Notice by the Company and, if such sale is not consummated within such sixty (60) day period, such sale shall again become subject to the Right of First Refusal and Secondary Refusal Right on the terms set forth herein.

(f) Consideration; Closing. If the consideration proposed to be paid for the Transfer Stock is in property, services or other non-cash consideration, the fair market value of the consideration shall be as determined in good faith by the Board and as set forth in the Company Notice. If the Company or any Rights Holder cannot for any reason pay for the Transfer Stock in the same form of non-cash consideration, the Company or such Rights Holder may pay the cash value equivalent thereof, as determined in good faith by the Board and as set forth in the Company Notice. The closing of the purchase of Transfer Stock by the Company and the Rights Holders shall take place, and all payments from the Company and the Rights Holders shall have been delivered to the selling Restricted Holder, by the later of (i) the date specified in the Proposed Transfer Notice as the intended date of the Proposed Restricted Holder Transfer; and (ii) sixty (60) days after delivery of the Proposed Transfer Notice.

9.2 Right of Co-Sale.

(a) Exercise of Right. If the Transfer Stock subject to a Proposed Restricted Holder Transfer is not purchased pursuant to Subsection 9.1 above and thereafter is to be sold to a Prospective Transferee, each respective Rights Holder may elect to exercise its Right of Co-Sale and participate on a pro rata basis in the Proposed Restricted Holder Transfer as set forth in Subsection 9.2(b) below and, subject to Subsection 9.2(d), otherwise on the same terms and conditions specified in the Proposed Transfer Notice. Each Rights Holder who desires to exercise its Right of Co-Sale (each, a "**Participating Rights Holder**") must give the selling Restricted Holder written notice to that effect within fifteen (15) days after the deadline for delivery of the Secondary Notice described above, and upon giving such notice such Participating Rights Holder shall be deemed to have effectively exercised the Right of Co-Sale.

(b) Shares Includable. Each Participating Rights Holder may include in the Proposed Restricted Holder Transfer all or any part of such Participating Rights Holder's Capital Stock equal to the product obtained by multiplying (i) the aggregate number of shares of Transfer Stock subject to the Proposed Restricted Holder Transfer by (ii) a fraction, the numerator of which is the number of shares of Capital Stock owned by such Participating Rights Holder immediately before consummation of the Proposed Restricted Holder Transfer and the denominator of which is the total number of shares of Capital Stock owned, in the aggregate, by all Participating Rights Holders immediately prior to the consummation of the Proposed Restricted Holder Transfer, plus the number of shares of Transfer Stock held by the selling Restricted Holder. To the extent one (1) or more of the Participating Rights Holders exercise such right of participation in accordance with the terms and conditions set forth herein, the number of shares of Transfer Stock that the selling Restricted Holder may sell in the Proposed Restricted Holder Transfer shall be correspondingly reduced.

(c) Purchase and Sale Agreement. The Participating Rights Holders and the selling Restricted Holder agree that the terms and conditions of any Proposed Restricted Holder Transfer in accordance with Subsection 9.2 will be memorialized in, and governed by, a written purchase and sale agreement with the Prospective Transferee (the "**Purchase and Sale Agreement**") with customary terms and provisions for such a transaction, and the Participating Rights Holders and the selling Restricted Holder further covenant and agree to enter into such Purchase and Sale Agreement as a condition precedent to any sale or other transfer in accordance with this Subsection 9.2.

(d) Allocation of Consideration.

(i) Subject to Subsection 9.2(d)(ii), the aggregate consideration payable to the Participating Rights Holders and the selling Restricted Holder shall be allocated based on the number of shares of Capital Stock sold to the Prospective Transferee by each Participating Rights Holder and the selling Restricted Holder as provided in Subsection 9.2(b), provided that if a Participating Rights Holder wishes to sell Preferred Stock, the price set forth in the Proposed Transfer Notice shall be appropriately adjusted based on the conversion ratio of the Preferred Stock into Common Stock.

(ii) In the event that the Proposed Restricted Holder Transfer constitutes a Stock Sale of the Company, the terms of the Purchase and Sale Agreement shall provide that the aggregate consideration from such transfer shall be allocated to the Participating Rights Holders and the selling Restricted Holder in accordance with Sections 2.1, 2.2, 2.3 and 2.4 of Article FOURTH, Part (B) of the Certificate of Incorporation as if (A) such transfer were a Deemed Liquidation Event (as defined in the Certificate of Incorporation), and (B) the Capital Stock sold in accordance with the Purchase and Sale Agreement were the only Capital Stock outstanding. In the event that a portion of the aggregate consideration payable to the Participating Rights Holder(s) and selling Restricted Holder is placed into escrow, the Purchase and Sale Agreement shall provide that (x) the portion of such consideration that is not placed in escrow (the "**Initial Consideration**") shall be allocated in accordance with Sections 2.1, 2.2, 2.3 and 2.4 of Article FOURTH, Part (B) of the Certificate of Incorporation as if the Initial Consideration were the only consideration payable in connection with such transfer, and (y) any additional consideration which becomes payable to the Participating Rights Holder(s) and selling Restricted Holder upon release from escrow shall be allocated in accordance with Sections 2.1, 2.2, 2.3 and 2.4 of Article FOURTH, Part (B) of the Certificate of Incorporation after taking into account the previous payment of the Initial Consideration as part of the same transfer.

(e) Purchase by Selling Restricted Holder; Deliveries. Notwithstanding Subsection 9.2(c) above, if any Prospective Transferee or Transferees refuse(s) to purchase securities subject to the Right of Co-Sale from any Participating Rights Holder or upon the failure to negotiate in good faith a Purchase and Sale Agreement reasonably satisfactory to the Participating Rights Holders, no Restricted Holder may sell any Transfer Stock to such Prospective Transferee or Transferees unless and until, simultaneously with such sale, such Restricted Holder purchases all securities subject to the Right of Co-Sale from such Participating Rights Holder on the same terms and conditions (including the proposed purchase price) as set forth in the Proposed Transfer Notice and as provided in Subsection 9.2(d)(i); provided, however, if such sale constitutes a Stock Sale of the Company, the aggregate consideration paid by the Selling Restricted Holder to such Participating Rights Holders, shall be allocated in accordance with Subsection 9.2(d)(ii) and further, the portion of the aggregate consideration received by the selling Restricted Holder from

the Transferees that exceeds the aggregate consideration payable by the selling Restricted Holder to such Participating Rights Holders (pursuant to this sentence) shall also be allocated in accordance with Subsection 9.2(d)(ii). In connection with such purchase by the selling Restricted Holder, such Participating Rights Holder shall deliver to the selling Restricted Holder any stock certificate or certificates, properly endorsed for transfer, representing the Capital Stock being purchased by the selling Restricted Holder (or request that the Company effect such transfer in the name of the selling Restricted Holder). Any such shares transferred to the selling Restricted Holder will be transferred to the Prospective Transferee against payment therefor in consummation of the sale of the Transfer Stock pursuant to the terms and conditions specified in the Proposed Transfer Notice, and the selling Restricted Holder shall concurrently therewith remit or direct payment to each such Participating Rights Holder the portion of the aggregate consideration to which each such Participating Rights Holder is entitled by reason of its participation in such sale as provided in this Subsection 9.2(e).

(f) Additional Compliance. If any Proposed Restricted Holder Transfer is not consummated within sixty (60) days after receipt of the Proposed Transfer Notice by the Company, the Restricted Holders proposing the Proposed Restricted Holder Transfer may not sell any Transfer Stock unless they first comply in full with each provision of this Section 9. The exercise or election not to exercise any right by any Rights Holder hereunder shall not adversely affect its right to participate in any other sales of Transfer Stock subject to this Subsection 9.2.

9.3 Effect of Failure to Comply.

(a) Transfer Void; Equitable Relief. Any Proposed Restricted Holder Transfer not made in compliance with the requirements of this Agreement shall be null and void ab initio, shall not be recorded on the books of the Company or its transfer agent and shall not be recognized by the Company. Each party hereto acknowledges and agrees that any breach of this Agreement would result in substantial harm to the other parties hereto for which monetary damages alone could not adequately compensate. Therefore, the parties hereto unconditionally and irrevocably agree that any non-breaching party hereto shall be entitled to seek protective orders, injunctive relief and other remedies available at law or in equity (including, without limitation, seeking specific performance or the rescission of purchases, sales and other transfers of Transfer Stock not made in strict compliance with this Agreement).

(b) Violation of First Refusal Right. If any Restricted Holder becomes obligated to sell any Transfer Stock to the Company or any Rights Holder under this Agreement and fails to deliver such Transfer Stock in accordance with the terms of this Agreement, the Company and/or such Rights Holder may, at its option, in addition to all other remedies it may have, send to such Restricted Holder the purchase price for such Transfer Stock as is herein specified and transfer to the name of the Company or such Rights Holder (or request that the Company effect such transfer in the name of an Rights Holder) on the Company's books any certificates, instruments, or book entry representing the Transfer Stock to be sold.

(c) Violation of Co-Sale Right. If any Restricted Holder purports to sell any Transfer Stock in contravention of the Right of Co-Sale (a "**Prohibited Transfer**"), each Rights Holder who desires to exercise its Right of Co-Sale under Subsection 9.2 may, in addition to such remedies as may be available by law, in equity or hereunder, require such Restricted Holder to

purchase from such Rights Holder the type and number of shares of Capital Stock that such Rights Holder would have been entitled to sell to the Prospective Transferee had the Prohibited Transfer been effected in compliance with the terms of Subsection 9.2. The sale will be made on the same terms, including, without limitation, as provided in Subsection 9.2(d)(i) and the first sentence of Subsection 9.2(d)(ii), as applicable, and subject to the same conditions as would have applied had the Restricted Holder not made the Prohibited Transfer, except that the sale (including, without limitation, the delivery of the purchase price) must be made within ninety (90) days after the Rights Holder learns of the Prohibited Transfer, as opposed to the timeframe proscribed in Subsection 9.2. Such Restricted Holder shall also reimburse each Rights Holder for any and all reasonable and documented out-of-pocket fees and expenses, including reasonable legal fees and expenses, incurred pursuant to the exercise or the attempted exercise of the Rights Holder's rights under Subsection 9.2.

10. Exempt Transfers.

10.1 Notwithstanding the foregoing or anything to the contrary herein, the provisions of Subsections 9.1 and 9.2 shall not apply (a) in the case of a Restricted Holder that is an entity, upon a transfer by such Restricted Holder to its stockholders, members, partners, other equity holders or Affiliates, (b) to a repurchase of Transfer Stock from a Key Holder by the Company at a price no greater than that originally paid by such Key Holder for such Transfer Stock and pursuant to an agreement containing vesting and/or repurchase provisions approved by a majority of the Board, or (c) in the case of a Restricted Holder that is a natural person or a trust, upon a transfer of Transfer Stock by such Restricted Holder made for bona fide estate planning purposes, either to one or more Immediate Family Members, or any other relative approved by the Board, or any custodian or trustee of any trust, partnership or limited liability company for the benefit of, or the ownership interests of which are owned wholly by such Restricted Holder or any such Immediate Family Members; provided that in the case of clause(s) (a) and (c), the Restricted Holder shall deliver prior written notice to the Rights Holders of such pledge, gift or transfer and such shares of Transfer Stock shall at all times remain subject to the terms and restrictions set forth in this Agreement and such transferee shall, as a condition to such issuance, deliver a counterpart signature page to this Agreement as confirmation that such transferee shall be bound by all the terms and conditions of this Agreement as a Restricted Holder (but only with respect to the securities so transferred to the transferee), including the obligations of a Restricted Holder with respect to Proposed Restricted Holder Transfers of such Transfer Stock pursuant to Section 9; and provided further in the case of any transfer pursuant to clause (a) or (c) above, that such transfer is made pursuant to a transaction in which there is no consideration actually paid for such transfer.

10.2 Exempted Offerings. Notwithstanding the foregoing or anything to the contrary herein, the provisions of Section 9 shall not apply to the sale of any Transfer Stock (a) to the public in an offering pursuant to an effective registration statement under the Securities Act; or (b) pursuant to a Sale of the Company.

10.3 Prohibited Transferees. Notwithstanding the foregoing, no Restricted Holder shall transfer any Transfer Stock to (a) any Competitor; or (b) any customer, distributor or supplier of the Company, if the Board should determine that such transfer would result in such customer, distributor or supplier receiving information that would place the Company at a competitive disadvantage with respect to such customer, distributor or supplier.

11. Miscellaneous.

11.1 Successors and Assigns. The rights under this Agreement may be assigned (but only with all related obligations) by a Holder to a transferee of Registrable Securities that: (i) is an Affiliate of a Holder; (ii) is a Holder's Immediate Family Member or trust for the benefit of an individual Holder or one or more of such Holder's Immediate Family Members; or (iii) after such transfer, holds at least 100,000 shares of Registrable Securities (subject to appropriate adjustment for stock splits, stock dividends, combinations, and other recapitalizations); provided, however, that (x) the Company is, within a reasonable time after such transfer, furnished with written notice of the name and address of such transferee and the Registrable Securities with respect to which such rights are being transferred; and (y) such transferee agrees in a written instrument delivered to the Company to be bound by and subject to the terms and conditions of this Agreement, including the provisions of Subsection 2.11, in substantially the form attached hereto as Exhibit A. For the purposes of determining the number of shares of Registrable Securities held by a transferee, the holdings of a transferee (1) that is an Affiliate or stockholder of a Holder; (2) who is a Holder's Immediate Family Member; or (3) that is a trust for the benefit of an individual Holder or such Holder's Immediate Family Member shall be aggregated together and with those of the transferring Holder; provided further that all transferees who would not qualify individually for assignment of rights shall have a single attorney-in-fact for the purpose of exercising any rights, receiving notices, or taking any action under this Agreement. Any successor or permitted assignee of any Restricted Holder, including any Prospective Transferee who purchases shares of Transfer Stock in accordance with the terms hereof, shall deliver to the Company and the Rights Holders, as a condition to any transfer or assignment, a counterpart signature page hereto pursuant to which such successor or permitted assignee shall confirm their agreement to be subject to and bound by all of the provisions set forth in this Agreement that were applicable to the predecessor or assignor of such successor or permitted assignee. The terms and conditions of this Agreement inure to the benefit of and are binding upon the respective successors and permitted assignees of the parties. Nothing in this Agreement, express or implied, is intended to confer upon any party other than the parties hereto or their respective successors and permitted assignees any rights, remedies, obligations or liabilities under or by reason of this Agreement, except as expressly provided herein.

11.2 Governing Law. This Agreement shall be governed by the internal law of the Commonwealth of Massachusetts, with the exception of Sections 5, 6 and 7, which shall be governed by the internal law of the State of Delaware, without regard to its conflict of laws principles that would cause the application of laws of any other jurisdiction.

11.3 Counterparts. This Agreement may be executed in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, *e.g.*, www.docusign.com) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

11.4 Titles and Subtitles. The titles and subtitles used in this Agreement are for convenience only and are not to be considered in construing or interpreting this Agreement.

11.5 Notices. All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed effectively given upon the earlier of actual receipt or (i) personal delivery to the party to be notified; (ii) when sent, if sent by electronic mail or facsimile during the recipient's normal business hours, and if not sent during normal business hours, then on the recipient's next business day; (iii) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid; or (iv) one (1) business day after the business day of deposit with a nationally recognized overnight courier, freight prepaid, specifying next-day delivery, with written verification of receipt. All communications shall be sent to the respective parties at their addresses as set forth on Schedule A or Schedule B hereto (as applicable), or to the principal office of the Company and to the attention of the Chief Executive Officer, in the case of the Company, or to such email address, facsimile number, or address as subsequently modified by written notice given in accordance with this Subsection 11.5. If notice is given to the Company, a copy shall also be sent to Latham & Watkins LLP, 27th Floor, 200 Clarendon Street, Boston, MA 02116, Attention: Peter N. Handrinos, facsimile: (617) 948-6001, email: peter.handrinos@lw.com.

11.6 Amendments and Waivers. Any term of this Agreement may be amended and the observance of any term of this Agreement may be waived (either generally or in a particular instance, and either retroactively or prospectively) only with the written consent of the Company, the Founder and the Requisite Preferred Holders; provided that the Company may in its sole discretion waive compliance with Subsection 2.11(c) (and the Company's failure to object promptly in writing after notification of a proposed assignment allegedly in violation of Subsection 2.11(c) shall be deemed to be a waiver); and provided further that any provision hereof may be waived by any waiving party on such party's own behalf, without the consent of any other party. Notwithstanding the foregoing, (a) Section 5.2(e), the last sentence of Section 1.7 (with regard to itself only), and this clause (a) may not be amended or waived without the written consent of Bain Capital Life Sciences, LP, (b) Section 7.2(d)(iii)(B) and this clause (b) may not be amended or waived without the written consent of the holders of a majority in voting power of the outstanding shares of Series D Preferred Stock and Series D-1 Preferred Stock, voting together as a single class, (c) clause (iv) in the first paragraph of Section 7.1 and this clause (c) may not be amended or waived without the written consent of the holders of a majority of the outstanding shares of Series D Preferred Stock, (d) clause (v) in the first paragraph of Section 7.1 and this clause (d) may not be amended or waived without the written consent of the holders of a majority of the outstanding shares of Series D-1 Preferred Stock, (e) the last sentence of Section 1.7 and Section 8.7 may not be amended or waived with regard to any of the Investors specifically named therein without the written consent of the applicable Investor, and this clause (e) may not be amended or waived without the written consent of each Investor specifically named in Section 8.7, and (f) this Agreement may not be amended or terminated and the observance of any term hereof may not be waived with respect to any Investor without the written consent of such Investor, unless such amendment, termination, or waiver applies to all Investors in the same fashion (it being agreed that a waiver of the provisions of Section 4 with respect to a particular transaction shall be deemed to apply to all Investors in the same fashion if such waiver does so by its terms, notwithstanding the fact that certain Investors may nonetheless, by agreement with the Company, purchase securities in such transaction). Further, this Agreement may not be amended, and no provision hereof may be waived, in each case, in any way which would adversely affect the rights of the Key Holders hereunder in a manner disproportionate to any adverse effect such amendment or waiver would have on the rights of the Investors hereunder, without also the written consent of the holders

of at least a majority of the Shares held by the Key Holders. Any amendment, termination, or waiver effected in accordance with this Subsection 11.6 shall be binding on all parties hereto, regardless of whether any such party has consented thereto. No waivers of or exceptions to any term, condition, or provision of this Agreement, in any one or more instances, shall be deemed to be or construed as a further or continuing waiver of any such term, condition, or provision.

11.7 Severability. In case any one or more of the provisions contained in this Agreement is for any reason held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision of this Agreement, and such invalid, illegal, or unenforceable provision shall be reformed and construed so that it will be valid, legal, and enforceable to the maximum extent permitted by law.

11.8 Aggregation of Stock. All shares of Registrable Securities held or acquired by Affiliates shall be aggregated together for the purpose of determining the availability of any rights under this Agreement and such Affiliated persons may apportion such rights as among themselves in any manner they deem appropriate.

11.9 Additional Parties.

(a) Notwithstanding anything to the contrary contained herein, if the Company issues additional shares of Preferred Stock after the date hereof, whether pursuant to the Purchase Agreement or otherwise, any purchaser of such shares of Preferred Stock may become a party to this Agreement by executing and delivering an additional counterpart signature page to this Agreement, and thereafter shall be deemed an "Investor" for all purposes hereunder. No action or consent by the Investors shall be required for such joinder to this Agreement by such additional Investor, so long as such additional Investor has agreed in writing to be bound by all of the obligations as an "Investor" hereunder.

(b) In the event that after the date of this Agreement, the Company enters into an agreement with any Person to issue shares of capital stock to such Person (other than to a purchaser of Preferred Stock described in Subsection 11.9(a) above), following which such Person shall hold Shares constituting one percent (1%) or more of the Company's then outstanding capital stock (treating for this purpose all shares of Common Stock issuable upon exercise of or conversion of outstanding options, warrants or convertible securities, as if exercised and/or converted or exchanged), then, the Company shall cause such Person, as a condition precedent to entering into such agreement, to become a party to this Agreement by executing an Adoption Agreement in the form attached hereto as Exhibit A, agreeing to be bound by and subject to the terms of this Agreement as a Stockholder and thereafter such person shall be deemed a Stockholder for all purposes under this Agreement.

11.10 Entire Agreement. This Agreement (including any Schedules and Exhibits hereto) constitutes the full and entire understanding and agreement among the parties with respect to the subject matter hereof, and any other written or oral agreement relating to the subject matter hereof existing between the parties is expressly canceled. Upon the effectiveness of this Agreement, the Prior Agreement shall be deemed amended and restated and superseded and replaced in its entirety by this Agreement, and shall be of no further force or effect.

11.11 Delays or Omissions. No delay or omission to exercise any right, power, or remedy accruing to any party under this Agreement, upon any breach or default of any other party under this Agreement, shall impair any such right, power, or remedy of such nonbreaching or nondefaulting party, nor shall it be construed to be a waiver of or acquiescence to any such breach or default, or to any similar breach or default thereafter occurring, nor shall any waiver of any single breach or default be deemed a waiver of any other breach or default theretofore or thereafter occurring. All remedies, whether under this Agreement or by law or otherwise afforded to any party, shall be cumulative and not alternative.

11.12 Transfers. Each transferee or assignee of any Shares subject to this Agreement shall continue to be subject to the terms hereof, and, as a condition precedent to the Company's recognizing such transfer, each transferee or assignee shall agree in writing to be subject to each of the terms of this Agreement by executing and delivering an Adoption Agreement substantially in the form attached hereto as Exhibit A. Upon the execution and delivery of an Adoption Agreement by any transferee, such transferee shall be deemed to be a party hereto as if such transferee were the transferor and such transferee's signature appeared on the signature pages of this Agreement and shall be deemed to be an Investor and Stockholder, or a Key Holder and Stockholder, as applicable. The Company shall not permit the transfer of the Shares subject to this Agreement on its books or issue a new certificate representing any such shares unless and until such transferee shall have complied with the terms of this Subsection 11.12. Each certificate instrument, or book entry representing the Shares subject to this Agreement if issued on or after the date of this Agreement shall be notated by the Company with the legend set forth in Subsection 11.13.

11.13 Share Certificate Legend. Each certificate, instrument, or book entry representing any Shares issued after the date hereof shall be notated by the Company with a legend reading substantially as follows:

> "THE SHARES REPRESENTED HEREBY ARE SUBJECT TO A FOURTH AMENDED AND RESTATED STOCKHOLDERS AGREEMENT, AS MAY BE AMENDED FROM TIME TO TIME (A COPY OF WHICH MAY BE OBTAINED UPON WRITTEN REQUEST FROM THE COMPANY), AND BY ACCEPTING ANY INTEREST IN SUCH SHARES THE PERSON ACCEPTING SUCH INTEREST SHALL BE DEEMED TO AGREE TO AND SHALL BECOME BOUND BY ALL THE PROVISIONS OF THAT FOURTH AMENDED AND RESTATED STOCKHOLDERS AGREEMENT, INCLUDING CERTAIN RESTRICTIONS ON TRANSFER AND OWNERSHIP SET FORTH THEREIN."

The Company, by its execution of this Agreement, agrees that it will cause the certificates instruments, or book entry evidencing the Shares issued after the date hereof to be notated with the legend required by this Subsection 11.13 of this Agreement, and it shall supply, free of charge, a copy of this Agreement to any holder of such Shares upon written request from such holder to the Company at its principal office. The parties to this Agreement do hereby agree that the failure to cause the certificates, instruments, or book entry evidencing the Shares to be notated with the legend required by this Subsection 11.13 herein and/or the failure of the Company to supply, free of charge, a copy of this Agreement as provided hereunder shall not affect the validity or enforcement of this Agreement.

11.14 Stock Splits, Stock Dividends, etc. In the event of any issuance of Shares of the Company's voting securities hereafter to any of the Stockholders (including, without limitation, in connection with any stock split, stock dividend, recapitalization, reorganization, or the like), such Shares shall become subject to this Agreement and shall be endorsed with the legend set forth in Subsection 11.13.

11.15 Term. The terms and conditions of Sections 5, 6, 7, 8, 9 and 10 of this Agreement shall terminate upon the earliest to occur of (a) the consummation of the IPO (other than a registration statement relating either to the sale of securities to employees of the Company pursuant to its stock option, stock purchase or similar plan or an SEC Rule 145 transaction); or (b) the consummation of a Sale of the Company and distribution of proceeds to or escrow for the benefit of the Stockholders in accordance with the Certificate of Incorporation, provided that the provisions of Section 7 hereof will continue after the closing of any Sale of the Company to the extent necessary to enforce the provisions of Section 7 with respect to such Sale of the Company.

11.16 Specific Performance. In addition to any and all other remedies that may be available at law in the event of any breach of this Agreement, each party to this Agreement shall be entitled to seek specific performance of the agreements and obligations of the other parties hereto under this Agreement and to seek such other injunction or other equitable relief as may be granted by a court of competent jurisdiction.

11.17 Ownership. EACH RESTRICTED HOLDER REPRESENTS AND WARRANTS THAT SUCH RESTRICTED HOLDER IS THE SOLE LEGAL AND BENEFICIAL OWNER OF THE SHARES OF TRANSFER STOCK SUBJECT TO THIS AGREEMENT AND THAT NO OTHER PERSON OR ENTITY HAS ANY INTEREST IN SUCH SHARES (OTHER THAN A COMMUNITY PROPERTY INTEREST AS TO WHICH THE HOLDER THEREOF HAS ACKNOWLEDGED AND AGREED IN WRITING TO THE RESTRICTIONS AND OBLIGATIONS HEREUNDER).

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

COMPANY:

ATEA PHARMACEUTICALS, INC.

By: /s/ Jean Pierre Sommadossi
Name:Jean Pierre Sommadossi
Title: Chief Executive Officer and President

FOUNDER:

/s/ Jean Pierre Sommadossi
Jean-Pierre Sommadossi, Ph.D.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

9W INVESTMENT FUND I LP

By: /s/ Brandon L. Jones
Name: Brandon L. Jones
Title: General Partner

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

ABG-ATEAB LIMITED

By: /s/ Shan-Ju Yeh
Name: Shan-Ju Yeh
Title: Director

ABG-ATEA LIMITED

By: /s/ Shan-Ju Yeh
Name: Shan-Ju Yeh
Title: Director

ALLY BRIDGE MEDALPHA MASTER FUND L.P.

By: Ally Bridge MedAlpha General Partner L.P., its General Partner

By: Ally Bridge MedAlpha GP LLC, its General Partner

By: /s/ Fan Yu
Name: Fan Yu
Title: Manager

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

ADAGE CAPITAL PARTNERS, L.P.

By: /s/ Dan Lehan
Name: Dan Lehan
Title: COO

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

AJU GROWTH & HEALTHCARE FUND

By: /s/ Derek Yoon
Name: Derek Yoon
Title: Managing Partner

AJU LIFE SCIENCE OVERSEAS EXPANSION PLATFORM FUND, LP

By: /s/ Derek Yoon
Name: Derek Yoon
Title: Managing Partner

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

ARCTIC FUNDS PLC

By: Arctic Fund Management AS, the Investment Manager for Arctic Funds plc

By: /s/ Torbjorn Bjerke
Name: Torbjorn Bjerke
Title: Portfolio Manager

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

ATEA BROOKLINE LLC

By: /s/ William B. Buchanan, Jr.
Name: William B. Buchanan, Jr.
Title: Managing Director

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

BAIN CAPITAL LIFE SCIENCES FUND II, L.P.

By: Bain Capital Life Sciences Investors II, LLC, its General Partner

By: Bain Capital Life Sciences Investors, LLC, its Manager

By: /s/ Andrew Hack
Name: Andrew Hack
Title: Managing Director

BCIP LIFE SCIENCES ASSOCIATES, LP

By: Boylston Coinvestors, LLC, its General Partner

By: /s/ Andrew Hack
Name: Andrew Hack
Title: Authorized Signatory

BAIN CAPITAL PUBLIC EQUITY GLOBAL PARTNERS FUND, L.P.

By: Bain Capital Public Equity Global Investors, LLC, its General Partner

By: Bain Capital Public Equity Management II, LLC, its Manager

By: /s/ Joshua Ross
Name: Joshua Ross
Title: Managing Director

BAIN CAPITAL PUBLIC EQUITY COINVEST (III), L.P.

By: Bain Capital Public Equity Global Investors, LLC, its General Partner

By: Bain Capital Public Equity Management II, LLC, its Manager

By: /s/ Andrew S. Viens
Name: Andrew S. Viens
Title: Managing Director

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

/s/ Richard Beleson

Richard Beleson

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

BLACKWELL PARTNERS LLC – SERIES a

By: /s/ Abayomi A. Adigun
Name: Abayomi A. Adigun
Title: Investment Manager
DUMAC, Inc. Authorized Signatory

By: /s/ Jannine M. Lall
Name: Jannine M. Lall
Title: Head of Finance & Controller
DUMAC, Inc. Authorized Signatory

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

/s/ David C L Chiu

David C L Chiu

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

/s/ Chung K. Chu

Chung K. Chu

/s/ Chung K. Chu and Jee H. Chu

Chung K. Chu and Jee H. Chu

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

FRED E. COHEN AND CAROLYN B. KLEBANOFF TRUST

By: /s/ Fred Cohen
Name: Fred Cohen
Title: Trustee

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

/s/ Andrea Corcoran

Andrea Corcoran

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

CORMORANT GLOBAL HEALTHCARE MASTER FUND, LP
By: Cormorant Global Healthcare GP, LLC
By: Bihua Chen, Managing Member of the GP

By: /s/ Bihua Chen
Name: Bihua Chen
Title: Managing Member

CORMORANT PRIVATE HEALTHCARE FUND I, LP
By: Cormorant Private Healthcare GP, LLC
By: Bihua Chen, Managing Member of the GP

By: /s/ Bihua Chen
Name: Bihua Chen
Title: Managing Member

CRMA SPV, L.P.
By: Cormorant Asset Management, LP
By: Bihua Chen, Managing Member of the Special Limited Partner

By: /s/ Bihua Chen
Name: Bihua Chen
Title: Managing Member

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

CY CAPITAL LIMITED

By: /s/ David C L CHIU
Name: David CL CHIU
Title: Director

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

Finance 1805 SA acting as nominee on behalf of undisclosed clients

By: /s/ Gérald Formaz
Name: Gérald Formaz
Title: Attorney

By: /s/ Frédéric Bertrand-Verdier
Name: Frédéric Bertrand-Verdier
Title: Attorney

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

HARNAT CAPITAL HOLDINGS LIMITED

By: /s/ David C L CHIU
Name: David CL CHIU
Title: Director

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

JAMBOREE INVESTMENTS LIMITED

By: /s/ David C L CHIU
Name: David CL CHIU
Title: Director

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

JEM FAMILY PARTNERSHIP, LLC

By: /s/ Laurence Blumberg, M.D.
Name: Laurence Blumberg, M.D.
Title: Manager

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

JPM PARTNERS LLC

By: /s/ Jean-Pierre Sommadossi
Name: Jean-Pierre Sommadossi
Title: Manager

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

/s/ Mark McDade

Mark McDade

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

For and on behalf of
MORNINGSIDE VENTURE INVESTMENTS LIMITED

By: /s/ Jill Marie Franklin/Frances Anne Elizabeth Richard
Name: Jill Marie Franklin/Frances Anne Elizabeth Richard
Title: Authorized Signatures

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

MARC & POLLY MURPHY REVOCABLE FAMILY TRUST DATED MARCH 13, 2002

By: /s/ Polly A. Murphy
Name: Polly A. Murphy
Title: Trustee

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

/s/ Robert L. Murphy
Robert L. Murphy
JEAN-PIERRE SOMMADOSSI TRUST 12/10/98

By: /s/ Robert L. Murphy
Name: Robert L. Murphy
Title: Trustee

ROBERT L. MURPHY, TRUSTEE OF THE ROBERT LEO MURPHY GRANTOR TRUST

By: /s/ Robert L. Murphy
Name: Robert L. Murphy
Title: Trustee

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

NEW EMERGING MEDICAL OPPORTUNITIES FUND II
by its investment manager

By: /s/ Michael Sjöström
Name: Michael Sjöström
Title: Senior Partner

Sectoral Asset Management
1010 Sherbrooke Str. W.
Suite 1810
Montreal, QC, H3A 2R7
Canada

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

NEW EMERGING MEDICAL OPPORTUNITIES FUND IV

By: Sectoral Asset Management Inc., its Manager

By: /s/ Michael Sjöström
Name: Michael Sjöström
Title: Senior Partner

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

OMEGA FUND VI, L.P.

By: Omega Fund VI GP, L.P., its General Partner

By: Omega Fund VI GP Manager, Ltd., its General Partner

By: /s/ Anne Mari-Paster
Name: Anne Mari-Paster
Title: Director

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

PERCEPTIVE LIFE SCIENCES MASTER FUND LTD

By: /s/ James H. Mannix
Name: James H. Mannix
Title: C.O.O.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

RA CAPITAL HEALTHCARE FUND, L.P.

By: RA Capital Healthcare Fund GP, LLC, its General Partner

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Manager

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

RA CAPITAL NEXUS FUND, L.P.

By: RA Capital Nexus Fund GP, LLC, its General Partner

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Manager

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

REDMILE BIOPHARMA INVESTMENTS II, L.P.

By: Redmile Biopharma Investments II (GP), LLC its General Partner

By: /s/ Joshua Garcia
Name: Joshua Garcia
Title: CFO and Authorized Signatory

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

ROCK SPRINGS CAPITAL MASTER FUND LP

By: Rock Springs General Partner LLC, its General Partner

By: /s/ Kris Jenner
Name: Kris Jenner
Title: Manager

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

T. ROWE PRICE HEALTH SCIENCES FUND, INC.

TD MUTUAL FUNDS – TD HEALTH SCIENCES FUND

VALIC COMPANY I – HEALTH SCIENCES FUND

T. ROWE PRICE HEALTH SCIENCES PORTFOLIO

Each account, severally and not jointly

By: T. Rowe Price Associates, Inc.,
Investment Adviser or Subadvisor, as applicable

By: /s/ Andrew Baek
Name: Andrew Baek
Title: Vice President

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

/s/ Marie M. Warburg
Marie Warburg

INVESTORS:

Jean-Marc Allaire

Jean Luc Allavena

Khalil Michel Amiouni

AMP FAMILY PARTNERSHIP III, LP

By: _____
Name:
Title:

_____
Josiah T. Austin

BERDON VENTURE ASSOCIATES LLC

By: _____
Name:
Title:

/s/ Franklin M. Berger
Franklin M. Berger

John G. Bradley

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

WESTLAND PROMENADE INVESTMENT INC.

By: /s/ David C L CHIU
Name: David CL CHIU
Title: Director

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

INVESTORS:

WINDSOR SQUARE INVESTMENT HOLDING INC.

By: /s/ David C L CHIU
Name: David CL CHIU
Title: Director

INVESTORS:

KATO INVESTMENTS, LLC

By: _____
Name:
Title:

_____
John Kellenyi

/s/ Joong Kil Kim
Joong Kil Kim

/s/ Sung Koo Kim
Sung Koo Kim

_____
Mario Kozma

_____
Klaus Kretschmer

_____
Robert Masters

_____
Blandine Medecin

INVESTORS:

9W INVESTMENT FUND I LP

By: _____
Name:
Title:

BROOKLINE SPECIAL SITUATIONS FUND, LLC

By: _____
Name:
Title:

CARINA LEVINTOFF,
TRUSTEE OF THE CARINA LEVINTOFF TRUST

By: _____
Name:
Title:

/s/ Susan Chu Walley
Susan Chu Walley

/s/ Chung K. Chu
Chung K. Chu

/s/ Jaclyn Chu
Jaclyn Chu

Andrea J. Corcoran

SCHEDULE A
Investors

9W Investment Fund I LP
Attn: Erik M.W. Caspersen or Brandon L. Jones
46 White Street #1
New York, NY 10012

ABG-AteaB Limited
Unit 3002-3004 30/F Gloucester Tower
The Landmark
15 Queen's Road
Central Hong Kong

ABG-ATEA Limited
PO Box 173
Kingston Chambers, British Virgin Islands MC275203

Ally Bridge MedAlpha Master Fund
Room 3002-3004, 30th Floor, Gloucester Tower, The Landmark, 15 Queens Road Central,
Hong Kong
Attn: Frank Yu
Tel: +852 3121 9688
Email: frank.yu@ally-bridge.com

Pauline Abou Gergi
[XXX]
[XXX]
[XXX]

Mark Afrasiabi
[XXX]
[XXX]

AJU Growth and Healthcare Fund
c/o AJU IB Investment Co., Ltd.
Attn: JT Won Kim, CEO
201 Teheran-ro
5th Floor
Gangnum-gu, Seoul, Korean 06141

AJU Life Science Overseas Expansion Platform Fund, LP
Attn: Jung Kyoo Yang
4F AJU Bldg
Yeoksam-dong
Gangnam-gu, Seoul, South Korea

Aju Pharm Co., Ltd.
662 Garden Circle
Statham, GA 30666

Jean-Marc Allaire
[XXX]
[XXX]

Jean Luc Allavena
[XXX]
[XXX]

Khalil Michel Amiouni
[XXX]
[XXX]
[XXX]
[XXX]

AMP Family Partnership III, LP
Attn: Art Pappas

[XXX]
[XXX]

ATEA-Brookline LLC
509 Madison Avenue – Suite 1006
New York NY 10022

Josiah T. Austin
[XXX]
[XXX]

Berdon Venture Associates LLC
37 Westerleigh Road
Purchase, NY 10577

Franklin M. Berger
[XXX]
[XXX]
[XXX]

Catherine Bettis
[XXX]
[XXX]

John G. Bradley
[XXX]
[XXX]

Brookline Special Situations Fund, LLC
2501 20th Place, South
Suite 275
Attn: Madding King, III
Birmingham, AL 35223

Carina Levintoff, Trustee of The Carina Levintoff Trust
[XXX]
[XXX]

David CL Chiu
[XXX]
[XXX]
[XXX]

Susan Chu Walley
[XXX]
[XXX]

Chung K. Chu
[XXX]
[XXX]

Chung K. Chu and Jee H. Chu
[XXX]
[XXX]

Jaclyn Chu
[XXX]
[XXX]

John A. Coleman
[XXX]
[XXX]
[XXX]

Andrea J. Corcoran
[XXX]
[XXX]

Cormorant Global Healthcare Master Fund, LP
Attn: Bihua Chen
200 Clarendon Street, 52nd Floor
Boston, MA 02116

Cormorant Private Healthcare Fund I, LP
Attn: Bihua Chen
200 Clarendon Street, 52nd Floor
Boston, MA 02116

CRMA SPV, L.P.
PO Box 309
Ugland House
Grand Cayman, Cayman Islands KY1-1104

CY Capital Limited
4/F, Acme Building
22 Nanking Street
Yaumatei, Kowloon, Hong Kong

Thomas M. Fitzgerald, III
[XXX]
[XXX]

Robert Flammang
[XXX]
[XXX]

Ellen Friedler
[XXX]
[XXX]

Steven J. Gilson
[XXX]
[XXX]

The James S. Ginsburg Dynasty Trust
[XXX]
Glencoe IL 60022

Harnat Capital Holdings Limited
4/F, Acme Building
22 Nanking Street
Yaumatei, Kowloon, Hong Kong

Jimmie Harvey
[XXX]
[XXX]

Helms Family Trust
[XXX]
[XXX]

Hessler Finance Limited
Marcy Bldg 2nd Fl, Purcell Estate
PO Box 2416, Road Town, Tortola BVI
c/o Nextgen Financial Advisors
Via Guisan 6, PO Box 20
6902 Lugano Switzerland

Roman Ivanov
[XXX]
[XXX]

Jamboree Investments Limited
4/F, Acme Building
22 Nanking Street
Yaumatei, Kowloon, Hong Kong

Jean-Pierre Sommadossi Irrevocable Trust 12/10/98
[XXX]
[XXX]

JPM Partners LLC
[XXX]
[XXX]

Kato Investments, LLC
1494 Treeline Drive
Malvern, PA 19355

John Kellenyi
[XXX]
[XXX]

Joong Kil Kim
[XXX]
[XXX]

Sung Koo Kim
[XXX]
[XXX]

Mario Kozma
[XXX]
[XXX]

Klaus Kretschmer
[XXX]
[XXX]

Laurence Lytton
[XXX]
[XXX]

Robert Masters
[XXX]
[XXX]

Charles S. Magolske
[XXX]
[XXX]

Peter A. Magolske
[XXX]
[XXX]

Blandine Medecin
[XXX]
[XXX]

Morningside Venture Investments Limited
Attn: Louise Mary Garbarino
2nd Floor, Le Prince de Galles, 3-5
Avenue des Citronniers
Monaco MC 98000

Robert L. Murphy
[XXX]
[XXX]

Campbell Murray
[XXX]
[XXX]

New Emerging Medical Opportunities Fund II
c/o Codan Trust Company (Cayman) Limited
PO Bx 2681 Cricket Sq, Hutchkins Dr.
Attn: Michael Sjostrom
Grand Cayman, Cayman Islands KY1-1111

New Emerging Medical Opportunities Fund IV SCSp
Sectoral Asset Management
1010 Sherbrooke St West, suite 1610
Montreal, QC CANADA H3A 2R7
Tel: +1 514 940 8083
Email: francois@sectoral.com

Robert Niecestro
[XXX]
[XXX]
[XXX]

Orderspeak Holding Limited Karava 2
Attn: Patricia Haddad Abouhalka
Ergates , Nicosia, Cyprus 2643

Ryan Pearson
[XXX]
[XXX]

The Ryan Pearson & Brittany McQuarry Pearson as co-trustees of the
Ryan & Brittany Pearson Living Trust
[XXX]
[XXX]

PharmaPros LLC
Kenneth D. Pearsen
6467 Main Street
Williamsville, NY 14221

RAQ, LLC
3 Columbus Circle, 15th Floor
Attn: Lindsay A. Rosenwald, MD
New York, NY 10019

Reinfrank Living Trust dtd 6/13/95
[XXX]
[XXX]

Jay Prystawosky, Trustee of the Rey Family Trust
[XXX]
[XXX]

RMI Investments S.A.R.L.
7, rue Robert Stimper
Luxembourg, L-2557

Lindsay A. Rosenwald
[XXX]
[XXX]

Samambia Investments Ltd
The Lake Building, Suite 120,
Wickhams Cays, Road Town, Torts, BVI

Satterfield Vintage Investments, L.P.
571 McDonald Road, Rockwall, Texas 75032
Mail correspondence: 2609 Caldwell Mill Lane, Mountain Brook, AL 35243

Carl and Toni Sadowsky, Tenants by Entirety
[XXX]
[XXX]
[XXX]

Nicholas S. Sadowsky
[XXX]
[XXX]

Richard A. Smith
[XXX]
[XXX]

Starlight Investment Holdings Limited (Anguilla)
9 Burrard Street Heritage Suite
The Valley, Anguilla

Stefan P. and Jane R. Shoup as Trustees of the Shoup Revocable Trust U/A/D 4/29/03
[XXX]
[XXX]

John Sonnier
[XXX]
[XXX]

Striker Asia Opportunities Fund Corporation
Attn: Huen Chung or Yuen Ian c/o Campbell Corporate Services Limited
Willow House Cricket Square, 4th Floor
PO Box 268
Grand Cayman, Cayman Islands KY1-1104

Goran Strokirk Living Trust (08/27/2002)
[XXX]
[XXX]

Sally H. Sullivan
[XXX]
[XXX]

Tisu Investments Limited
Bert K. Waits
306 Wild Olive Lane
Longwood, FL 32799

John F. Vavricka Deed of Trust
[XXX]
[XXX]

Bert K. Waits
[XXX]
[XXX]

Marie M. Warburg
[XXX]
[XXX]

Westland Promenade Investment Inc.
4/F, Acme Building
22 Nanking Street
Yaumatei, Kowloon, Hong Kong

Steven J. Wice
[XXX]
[XXX]

Widder Family Limited Partnership
PO Box 676250
Attn: M. Jacqueline Johnson
Santa Fe, CA 92067

Patrick S. Wilmerding
[XXX]
[XXX]

Windsor Square Investment Holding Inc.
4/F, Acme Building
22 Nanking Street
Yaumatei, Kowloon, Hong Kong

The Diana Wu Family Trust
[XXX]
[XXX]

Finance 1805 S.A., acting as nominee
60, Route des Acacias
1227 Carouge, Geneva
Switzerland

Valence Helix Investments II LLC
Attn: Eric W. Roberts Manager
590 Madison Avenue, 21st Floor
New York, NY 10022

Ernest W. Moody Revocable Trust
[XXX]
[XXX]
[XXX]

Bain Capital Life Sciences Fund II, L.P.
c/o Bain Capital Life Sciences, LP
200 Clarendon Street
Boston, MA 02116
Attn: Andrew Hack
Electronic Mail: AHack@BainCapital.com

BCIP Life Sciences Associates, LP
c/o Bain Capital Life Sciences, LP
200 Clarendon Street
Boston, MA 02116
Attn: Andrew Hack
Electronic Mail: AHack@BainCapital.com

Bain Capital Public Equity Coinvest (III), L.P.
c/o Bain Capital Life Sciences, LP
200 Clarendon Street
Boston, MA 02116
Attn: Andrew Viens
Electronic Mail: AViens@BainCapital.com

Bain Capital Public Equity Global Partners Fund, L.P.
200 Clarendon Street
Boston, MA 02116
Attn: Josh Ross
Email: JRoss@BainCapital.com

Adage Capital Partners, L.P.
Adage Capital Management, L.P.
200 Clarendon Street, 52nd FL
Boston, MA 02116
Attn: Dan Lehan COO
Tel: (617) 867-2543
Email: djl@adagecapital.com

Arctic Funds plc
Regeringsgatan 38, SE-11156
Stockholm, Sweden
Attn: Torbjorn Bjerke
Tel: +46727444158
Email: torbjorn.bjerke@arctic.com

Richard Beleson
[XXX]
[XXX]
[XXX]
[XXX]
[XXX]

Fred E. Cohen and Carolyn B. Klebanoff Trust
[XXX]
[XXX]
[XXX]

JEM Family Partnership, LLC
[XXX]
[XXX]
[XXX][XXX]

Marc & Polly Murphy Revocable Family Trust dated March 13, 2002
[XXX]
[XXX]
[XXX]

Omega Fund VI, L.P.
888 Boylston Street
Suite 1111
Boston, MA 02199
Attn: General Counsel
Tel: 617-512-1989
Email : dac@omegafunds.com

Perceptive Life Sciences Master Fund LTD
51 Astor Place, 10th floor
New York NY 10003
Attn: James H. Mannix, COO
Tel: 646 205 5300
Email: james@perceptivelife.com

RA Capital Healthcare Fund, L.P.
200 Berkley Street
18th Floor
Boston MA 02116
Tel: 617-778-2500
Email: legal@racap.com

Blackwell Partners LLC – Series A
280 S. Mangum Street, Suite 210
Durham, NC 27701
Attn: Jannie Lall
Tel: 617-778-2500
Email: legal@racap.com

RA Capital Nexus Fund, L.P.
200 Berkley Street
18th Floor
Boston MA 02116
Tel: 617-778-2500
Email: legal@racap.com

Redmile Biopharma Investments II, L.P.
One Letterman Drive, Suite D3-300
The Presidio, San Francisco, CA 94129
Tel: (415) 844-2604
Email: operations@redmilegrp.com

Rock Springs Capital Master Fund LP
650 South Exeter Street, Suite 1070
Baltimore MD 21202
Attn: General Counsel
Email: kris@rockspringscapital.com, ops@rockspringscapital.com, daphne@rockspringscapital.com, and jill@rockspringscapital.com

Four Pines Master Fund LP
650 South Exeter Street, Suite 1070
Baltimore MD 21202
Attn: General Counsel
Email: kris@rockspringscapital.com, ops@rockspringscapital.com, daphne@rockspringscapital.com, and jill@rockspringscapital.com

T. Rowe Price Health Sciences Fund, Inc.
T. Rowe Price Associates, Inc.
100 East Pratt Street
Baltimore, MD 21202
Attn.: Andrew Baek, Vice President
Phone: 410-345-2090
E-mail: andrew.baek@troweprice.com

TD Mutual Funds—TD Health Sciences Fund
T. Rowe Price Associates, Inc.
100 East Pratt Street
Baltimore, MD 21202
Attn.: Andrew Baek, Vice President
Phone: 410-345-2090
E-mail: andrew.baek@troweprice.com

VALIC Company I—Health Sciences Fund
T. Rowe Price Associates, Inc.
100 East Pratt Street
Baltimore, MD 21202
Attn.: Andrew Baek, Vice President
Phone: 410-345-2090
E-mail: andrew.baek@troweprice.com

T. Rowe Price Health Sciences Portfolio
T. Rowe Price Associates, Inc.
100 East Pratt Street
Baltimore, MD 21202
Attn.: Andrew Baek, Vice President
Phone: 410-345-2090
E-mail: andrew.baek@troweprice.com

Mark McDade
[XXX]
[XXX]
[XXX]
[XXX]

SCHEDULE B
Key Holders

JPM Partners LLC
[XXX]
[XXX]

Jean-Pierre Sommadossi Trust 12/10/98
[XXX]
[XXX]

Chung K. Chu
[XXX]
[XXX]

EXHIBIT A

ADOPTION AGREEMENT

This Adoption Agreement ("**Adoption Agreement**") is executed on _____, 20__, by the undersigned (the "**Holder**") pursuant to the terms of that certain Fourth Amended and Restated Stockholders Agreement dated as of _____, 2020 (the "**Agreement**"), by and among the Atea Pharmaceuticals, Inc., a Delaware corporation (the "**Company**"), and certain of its stockholders, as such Agreement may be amended or amended and restated hereafter. Capitalized terms used but not defined in this Adoption Agreement shall have the respective meanings ascribed to such terms in the Agreement. By the execution of this Adoption Agreement, the Holder agrees as follows.

1.1 Acknowledgement. Holder acknowledges that Holder is acquiring certain shares of the capital stock of the Company (the "**Stock**")[or options, warrants, or other rights to purchase such Stock (the "**Options**")], for one of the following reasons (Check the correct box):

☐ As a transferee of Shares from a party in such party's capacity as an "Investor" bound by the Agreement, and after such transfer, Holder shall be considered an "Investor" and a "Stockholder" for all purposes of the Agreement.

☐ As a transferee of Shares from a party in such party's capacity as a "Key Holder" bound by the Agreement, and after such transfer, Holder shall be considered a "Key Holder" and a "Stockholder" for all purposes of the Agreement.

☐ As a new Investor in accordance with Subsection 11.9(a) of the Agreement, in which case Holder will be an "Investor" and a "Stockholder" for all purposes of the Agreement.

☐ In accordance with Subsection 11.9(b) of the Agreement, as a new party who is not a new Investor, in which case Holder will be a "Stockholder" for all purposes of the Agreement.

1.2 Agreement. Holder hereby (a) agrees that the Stock [Options], and any other shares of capital stock or securities required by the Agreement to be bound thereby, shall be bound by and subject to the terms of the Agreement and (b) adopts the Agreement with the same force and effect as if Holder were originally a party thereto.

1.3 Notice. Any notice required or permitted by the Agreement shall be given to Holder at the address or facsimile number listed below Holder's signature hereto.

HOLDER: _____

_____
Name of Signatory

Address: _____

_____

Facsimile Number: _____

ACCEPTED AND AGREED:

ATEA PHARMACEUTICALS, INC.

By: _____

Name: _____

Title: _____

ATEA PHARMACEUTICALS, INC.

AMENDMENT NO. 1 TO FOURTH AMENDED AND RESTATED STOCKHOLDERS AGREEMENT

This AMENDMENT NO. 1 TO FOURTH AMENDED AND RESTATED STOCKHOLDERS AGREEMENT ("**Amendment**"), dated as of August 17, 2020, amends that certain Fourth Amended and Restated Stockholders Agreement, dated as of May 19, 2020, by and among Atea Pharmaceuticals, Inc., a Delaware corporation, the Founder (as defined in the Stockholders Agreement) and the Stockholders identified therein (the "**Stockholders Agreement**"). Capitalized terms used and not defined herein shall have the meanings set forth in the Stockholders Agreement.

WHEREAS, the Stockholders Agreement provides, among other things, that each Stockholder agrees to vote, or cause to be voted, all Shares owned by such Stockholder, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that the size of the Board of Directors of the Company (the "**Board**") shall be set at and remain at nine members, and sets forth the agreement of the Stockholders with respect to voting for the election of individuals to the Board;

WHEREAS, the Company, the Founder and the Requisite Preferred Holders (as defined in the Stockholders Agreement) desire to amend the Stockholders Agreement to set the size of the Board at eleven directors and to increase the number of Independent Designees to five and designate Polly Murphy as an Independent Designee and leave one seat vacant; and

WHEREAS, Subsection 11.6 of the Stockholders Agreement provides that the Stockholders Agreement may be amended with the written consent of (i) the Company, (ii) the Founder and (iii) the Requisite Preferred Holders.

NOW, THEREFORE, in consideration of the mutual covenants contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company, the Founder and the undersigned, who constitute the Requisite Preferred Stockholders, hereby agree as follows:

1. Section 5.1 of the Stockholders Agreement is hereby amended and restated in its entirety to read as follows:

"5.1 Size of the Board. Each Stockholder agrees to vote, or cause to be voted, all Shares (as defined below) owned by such Stockholder, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that the size of the Board shall be set and remain at eleven (11) directors and may be increased only with the written consent of the Founder Holders and the Requisite Preferred Holders."

2. Section 5.2(g) of the Stockholders Agreement is hereby amended and restated in its entirety to read as follows:

"(g) Five (5) persons who are each not otherwise an Affiliate of the Company or of any Stockholder and who are mutually acceptable to (i) the Founder and (ii) the holders of a majority in voting power of the outstanding shares of Preferred Stock (the "**Independent Designees**"), who shall initially be Franklin Berger, Bruce Polsky, Bruno Lucidi and Polly Murphy, and one seat shall initially be vacant."

3. Entire Agreement. The Stockholders Agreement, as amended by this Amendment, contains the entire agreement among the parties with respect to the subject matter thereof and amends, restates and supersedes all prior and contemporaneous arrangements or understandings with respect thereto.

4. Effectiveness. Each reference in the Stockholders Agreement to "this Agreement," "hereunder," "hereof," "herein" or words of like import, and each reference in the other documents entered into in connection with the Stockholders Agreement, shall mean and be a reference to the Stockholders Agreement, as amended hereby. Except as specifically amended above, the Stockholders Agreement shall remain in full force and effect and is hereby ratified and confirmed.

5. Governing Law. This Amendment and any controversy arising out of or relating to this Amendment shall be governed by and construed in accordance with the internal laws of the State of Delaware, without regard to conflict of law principles that would result in the application of any law other than the law of the State of Delaware.

6. Counterpart Signature Pages. This Amendment may be executed in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, *e.g.*, www.docusign.com) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, this Amendment has been executed by the parties hereto as of the day and year first above written.

ATEA PHARMACEUTICALS, INC.

By: /s/ Jean-Pierre Sommadossi, Ph.D.
Name: Jean-Pierre Sommadossi, Ph.D.
Title: Chief Executive Officer and President

FOUNDER:

/s/ Jean-Pierre Sommadossi, Ph.D.
Jean-Pierre Sommadossi, Ph.D.

IN WITNESS WHEREOF, this Amendment has been executed by the parties hereto as of the day and year first above written.

INVESTORS:

9W INVESTMENT FUND I LP

By: /s/ Brandon L. Jones
Name: Brandon L. Jones
Title: Authorized

ABG-ATEAB LIMITED

By: /s/ Shan-ju YEH
Name: Shan-ju YEH
Title: Director

ABG-ATEA LIMITED

By: /s/ Shan-ju YEH
Name: Shan-ju YEH
Title: Director

Pauline Abou Gergi

AJU LIFE SCIENCE OVERSEAS EXPANSION PLATFORM FUND, LP

By: _____
Name:
Title:

AJU PHARM CO., LTD.

By: _____
Name:
Title:

Jean-Marc Allaire

Jean Luc Allavena

Khalil Michel Amiouni

AMP FAMILY PARTNERSHIP III, LP

By: _____
Name:
Title:

Josiah T. Austin

BERDON VENTURE ASSOCIATES LLC

By: _____
Name:
Title:

Franklin M. Berger

John G. Bradley

BROOKLINE SPECIAL SITUATIONS FUND, LLC

By: _____
Name:
Title:

CARINA LEVINTOFF, TRUSTEE OF THE CARINA LEVINTOFF TRUST

By: _____
Name:
Title:

_____
Jaclyn Chu

_____
Thomas M. Fitzgerald III

_____
Robert Flammang

_____
Steven J. Gilson

_____
Jimmie Harvey

HESSLER FINANCE LIMITED

By: _____
Name:
Title:

_____
Roman Ivanov

JAY PRYSTAWOSKY, TRUSTEE OF THE REY FAMILY TRUST

By: _____
Name:
Title:

KATO INVESTMENTS, LLC

By: _____
Name:
Title:

_____
John Kellenyi

_____
Joong Kil Kim

_____
Sung Koo Kim

_____
Mario Kozma

Klaus Kretschmer

Robert Masters

Blandine Medecin

MORNINGSIDE VENTURE INVESTMENTS LIMITED

By: /s/ Hon Kit Bing, Jill Marie Franklin
Name: Hon Kit Bing/Jill Marie Franklin
Title: Authorized Signatures

Robert L. Murphy

NEW EMERGING MEDICAL OPPORTUNITIES FUND II

By: /s/ Michael Sjöström
Name: Michael Sjöström
Title: Senior Partner

Robert Niecestro

ORDERSPEAK HOLDING LIMITED

By: _____
Name:
Title:

_____
Ryan Pearson

PHARMAPROS LLC

By: _____
Name:
Title:

RAQ, LLC

By: _____
Name:
Title:

REINFRANK LIVING TRUST DTD 6/13/95

By: _____
Name:
Title:

RMI INVESTMENTS S.A.R.L.

By: /s/ Alexander Waechter
Name: Alexander Waechter
Title: Category A Manager

Lindsay A. Rosenwald

Richard A. Smith

STARLIGHT INVESTMENT HOLDINGS LIMITED (ANGUILLA)

By: _____
Name:
Title:

STEFAN P. AND JANE R. SHOUP AS TRUSTEES OF THE SHOUP REVOCABLE TRUST U/A/D 4/29/03

By: _____
Name:
Title:

STERN AGEE & LEACH, INC. C/F JOHN A. COLEMAN R/O IRA

By: _____
Name:
Title:

STRIKER ASIA OPPORTUNITIES FUND CORPORATION

By: _____
Name:
Title:

Sally H. Sullivan

TISU INVESTMENTS LIMITED

By: _____
Name:
Title:

Bert K. Waits

Marie M. Warburg

Steven J. Wice

WIDDER FAMILY LIMITED PARTNERSHIP

By: _____
Name:
Title:

Patrick S. Wilmerding

Jinn Wu

Patricia Abouhalka

Mathieu Bigois

David Blanchard

BROOKLINE GROUP, LLC

By:
Name:
Title:

Gerald Chan

Susan Chu Walley

Chung K. Chu

Jaelyn Chu

/s/ Andrea J. Corcoran
Andrea J. Corcoran

FIRESTONE ASSET MANAGEMENT LLC

By: _____
Name:
Title:

_____
Bradley L. Freilich

_____
Cynthia Gagne

_____
Steven S. Good

_____
Anton Gopka

JEAN-PIERRE SOMMADOSSI TRUST 12/10/98

By: _____
Name:
Title:

JPM PARTNERS LLC

By: /s/ Jean-Pierre Sommadossi
Name: Jean-Pierre Sommadossi
Title: Manager

_____
Scott Katzmann

Sherry Knowles

Paolo LaColla

Bruno Lucidi

Harris Lydon

Adel Moussa

John Dexter Pearson

/s/ Bruce Polsky
Bruce Polsky

Jean-Marie Vallet

Xiao-Jian Zhou

ATEA-BROOKLINE LLC

By: /s/ William B. Buchanan Jr.

Name: William B. Buchanan Jr.
Title: Managing Partner

Jinn Wu, as the trustee of The Diana Wu Family Trust dated May 19, 2016

By: _____
Name:
Title:

CORMORANT GLOBAL HEALTHCARE MASTER FUND, LP
By: Cormorant Global Healthcare GP, LLC
By: Bihua Chen, Managing Member of the GP

By: /s/ Bihau Chen
Name: Bihau Chen
Title:

CORMORANT PRIVATE HEALTHCARE FUND I, LP
By: Cormorant Private Healthcare GP, LLC
By: Bihua Chen, Managing Member of the GP

By: /s/ Bihau Chen
Name: Bihau Chen
Title:

CRMA SPV, L.P.
By: Cormorant Asset Management, LLC
By: Bihua Chen, Managing Member of the Special Limited Partner

By: /s/ Bihau Chen
Name: Bihau Chen
Title:

John Vavricka as Trustee of the John F. Vavricka Deed of Trust

By: _____
Name:
Title:

Goran Strokirk, as trustee of the Goran Strokirk Trust (8-27-2002)

By: _____
Name:
Title:

Lena S. Helms, as Trustee of the Helms Family Trust dated August 5, 1991

By: _____
Name:
Title:

Ryan W. Pearson and Brittany McQuarry Pearson, as co-trustees of The Ryan and Brittany Pearson Living Trust, u/a dated June 3, 2016

By: _____
Name:
Title:

_____
Adin Campbell Murray

_____

Nick Sadowsky

Ze-ai C. Wu

THE JAMES S. GINSBURG DYNASTY TRUST

By: _____
Name: Linda Ginsburg
Title: Trustee

AJU GROWTH & HEALTHCARE FUND

By: _____
Name:
Title:

SAMAMBIA INVESTMENTS LTD

By: _____
Name:
Title:

Chung K. Chu and Jee H. Chu

CARL AND TONI SADOWSKY TENANTS BY ENTIRETY

By: _____
Name:
Title:

_____
John Sonnier

_____
Laurence Lytton

SATTERFIELD VINTAGE INVESTMENTS, L.P.

By: _____
Name:
Title:

_____
Ellen B. Friedler

_____
Mark Afrasiabi

BAIN CAPITAL LIFE SCIENCES FUND II, L.P.

By: Bain Capital Life Sciences Investors II, LLC, its General Partner

By: Bain Capital Life Sciences Investors, LLC, its Manager

By: /s/ Andrew Hack
Name: Andrew Hack
Title: Managing Director

BCIP LIFE SCIENCES ASSOCIATES, LP

By: Boylston Coinvestors, LLC, its General Partner

By: /s/ Andrew Hack
Name: Andrew Hack
Title: Authorized Signatory

BAIN CAPITAL PUBLIC EQUITY GLOBAL PARTNERS FUND, L.P.

By: Bain Capital Public Equity Global Investors, LLC, its general partner

By: Bain Capital Public Equity Management II, LLC, its Manager

By: /s/ Joshua Ross
Name: Joshua Ross
Title: Managing Director

ADAGE CAPITAL PARTNERS, L.P.

By: /s/ Dan Lehan
Name:Dan Lehan
Title: COO

ALLY BRIDGE MEDALPHA MASTER FUND, L.P.

By: Ally Bridge MedAlpha General Partner, L.P., its General Partner

By: Ally Bridge MedAlpha GP LLC, its General Partner

By: /s/ Fan Yu
Name: Fan Yu
Title: Manager

ARCTIC FUNDS PLC

By: Arctic Fund Management AS, the Investment Manager for Arctic Funds plc

By: _____
Name: Torbjorn Bjerke
Title: Portfolio Manager

Richard Beleson

FRED E. COHEN AND CAROLYN B. KLEBANOFF TRUST

By: _____
Name:
Title:

JEM FAMILY PARTNERSHIP, LLC

By: _____
Name:
Title:

Mark McDade

MARC & POLLY MURPHY REVOCABLE FAMILY TRUST DATED MARCH 13, 2002

By: _____
Name:
Title:

OMEGA FUND VI, L.P.

By: Omega Fund VI GP, L.P., its General Partner

By: Omega Fund VI GP Manager, Ltd., its General Partner

By: _____
Name: Anne-Mari Paster
Title: Director

PERCEPTIVE LIFE SCIENCES MASTER FUND LTD

By: _____
Name: James H Mannix
Title: C.O.O.

RA CAPITAL HEALTHCARE FUND, L.P.

By: RA Capital Healthcare Fund GP, LLC, its General Partner

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Manager

BLACKWELL PARTNERS LLC – SERIES A

By: RA Capital Management, L.P., solely with respect to the assets for which it acts as investment manager

By: RA Capital Management GP, LLC, its General Partner

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Authorized Signatory

RA CAPITAL NEXUS FUND, L.P.

By: RA Capital Nexus Fund GP, LLC its General Partner

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Manager

REDMILE BIOPHARMA INVESTMENTS II, L.P.

By: Redmile Biopharma Investments II (GP), LLC
its General Partner

By: /s/ Joshua Garcia
Name: Joshua Garcia
Title: CFO

ROCK SPRINGS CAPITAL MASTER FUND LP

By: Rock Springs General Partner, LLC
its General Partner

By: _____
Name:
Title: Member

FOUR PINES MASTER FUND LP

By: Four Pines General Partner LLC, its General Partner

By: _____
Name:
Title: Member

CY CAPITAL LIMITED

By: _____
Name:
Title: Director

HARNAT CAPITAL HOLDINGS LIMITED

By: _____
Name:
Title: Director

JAMBOREE INVESTMENTS LIMITED

By: _____
Name:
Title: Director

WESTLAND PROMENADE INVESTMENT INC

By: _____
Name:
Title: Director

_____
Peter A. Magolske

WINDSOR SQUARE INVESTMENT HOLDING INC

By: _____
Name:
Title: Director

FINANCE 1805 SA

By: _____
Name:
Title:

NEW EMERGING MEDICAL OPPORTUNITIES FUND IV SCSP

By: Sectoral Asset Management Inc., its Manager

By: /s/ Michael Sjöström
Name: Michael Sjöström
Title: Senior Partner

APPLIED FOOD SCIENCES, INC.

By: _____
Name:
Title:

VALENCE HELIX INVESTMENTS II LLC.

By: _____
Name:
Title:

ERNEST W. MOODY REVOCABLE TRUST

By: _____
Name:
Title: Trustee

T. ROWE PRICE HEALTH SCIENCES FUND, INC.

TD MUTUAL FUNDS – TD HEALTH SCIENCES FUND

VALIC COMPANY I – HEALTH SCIENCES FUND

T. ROWE PRICE HEALTH SCIENCES PORTFOLIO

Each account, severally and not jointly

By: T. Rowe Price Associates, Inc.,
Investment Adviser or Subadvisor, as applicable

By: _____
Name: Andrew Baek
Title: Vice President

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item 601(b)(10). Such excluded information is not material and would likely cause competitive harm to the registrant if publicly disclosed.

Execution Version
Confidential

License Agreement

This Agreement is entered into with effect as of the Effective Date (as defined below)

by and between

F. Hoffmann-La Roche Ltd

with an office and place of business at Grenzacherstrasse 124, 4070 Basel, Switzerland ("**Roche Basel**")

and

Genentech, Inc.

with an office and place of business at 1 DNA Way, South San Francisco, California 94080, U.S.A. ("**Genentech**"; Roche Basel and Genentech together referred to as "**Roche**")

on the one hand

and

Atea Pharmaceuticals, Inc.

with an office and place of business at 125 Summer Street, Boston, Massachusetts 02110, U.S.A. ("**Atea**")

on the other hand.

Table of Contents

License Agreement

WHEREAS, Atea has discovered proprietary compounds with antiviral activity, including compound known as AT-527 and potential back-up compounds, and possesses proprietary technology and intellectual property rights relating thereto; and

WHEREAS, Roche has expertise in the research, development, manufacture and commercialization of pharmaceutical and diagnostic products; and

WHEREAS, Roche wishes to develop for commercialization such compounds and explore their potential applications in various therapeutic areas; and

WHEREAS, Atea is willing to grant to Roche exclusive rights to use certain of its intellectual property rights to research, develop, register, use, import, export, market, distribute, and sell Compounds, Products and Companion Diagnostics in the Roche Territory for use in the Field, non-exclusive rights to make, import, and export Compounds, Products and Companion Diagnostics in the Field in the Territory for use in the Field, and non-exclusive rights to research and develop Compounds, Products and Companion Diagnostics in the Atea Territory for use in the Field (as such terms are respectively defined below), as contemplated herein; and

WHEREAS, Roche and Atea agree that Roche and Atea will perform certain activities to develop, manufacture and commercialize Compounds and Products, as contemplated herein.

NOW, THEREFORE, in consideration of the mutual covenants and promises contained in this Agreement and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto, intending to be legally bound, do hereby agree as follows:

1. Definitions

As used in this Agreement, the following terms, whether used in the singular or plural, shall have the following meanings:

1.1 Accounting Standards

The term “Accounting Standards” shall mean with respect to a given Party, its Affiliate, or its Sublicensee, either (a) IFRS or (b) United States generally accepted accounting principles (GAAP), in either case, as currently used at the applicable time by, and as consistently applied by, such applicable Party or its Affiliate or Sublicensee.

1.2 Affiliate

The term “Affiliate” shall mean any individual, corporation, association or other business entity that directly or indirectly controls, is controlled by, or is under common control with the Party in question. As used in this definition of “Affiliate,” the term “control” shall mean the direct or indirect ownership of more than fifty percent (>50%) of the stock having the right to vote for directors thereof or the ability to otherwise control the management of the corporation or other business entity whether through the ownership of voting securities, by contract, resolution, regulation or otherwise. Anything to the contrary in this paragraph notwithstanding, [***].

1.3 Agreement

The term “Agreement” shall mean this document including any and all appendices and amendments to it as may be added or amended from time to time in accordance with the provisions of this Agreement.

1.4 Agreement Term

The term “Agreement Term” shall mean the period of time commencing on the Effective Date and, unless this Agreement is terminated sooner as provided in Article 19, expiring on the date when no royalty or other payment obligations under this Agreement are or will become due.

1.5 API

The term “API” shall mean the Compound as pharmaceutically active agent that is used for manufacturing the Product.

1.6 Applicable Law

The term “Applicable Law” shall mean any law, statute, ordinance, code, rule or regulation that has been enacted by a government authority (including without limitation, any Regulatory Authority) and is in force as of the Effective Date or comes into force during the Agreement Term, in each case to the extent that the same is applicable to the performance by the Parties of their respective obligations under this Agreement.

1.7 Atea Base Patent Rights

The term “Atea Base Patent Rights” shall mean Patent Rights in the Territory that are Controlled by Atea at the Effective Date, said Patent Rights being exhaustively listed in Appendix 1.7.

1.8 Atea Know-How

The term “Atea Know-How” shall mean the Know-How that Atea Controls at the Effective Date and during the Agreement Term relating to or arising from the discovery, manufacture, development or commercialization of or necessary or reasonably useful to discover, manufacture, develop or commercialize a Product.

1.9 Atea Ongoing Studies

The term “Atea Ongoing Studies” shall mean the non-clinical studies and Clinical Studies that are being conducted by Atea with respect to Compounds and Products as of the Effective Date, [***]. The Atea Ongoing Studies are described in Appendix 1.9.

1.10 Atea Patent Rights

The term “Atea Patent Rights” shall mean the Patent Rights that Atea Controls, relating to or arising from the discovery, manufacture, development or commercialization of or Covering a Product. The term Atea Patent Rights shall include Atea Base Patent Rights.

1.11 Atea Territory

The term “Atea Territory” shall mean the US.

1.12 Back-Up Compound

The term “Back-Up Compound” shall mean a molecule other than the Lead Compound, [***] and that:

a) (i) [***], or (ii) has [***]; and/or

b) is an [***] of a compound described in subclause (a) above,

in each case a) and b), that was generated by or on behalf of Atea, or that is otherwise proprietary to and Controlled by Atea, at the Effective Date or during the Agreement Term.

1.13 Calendar Quarter

The term “Calendar Quarter” shall mean each period of three (3) consecutive calendar months, ending March 31, June 30, September 30, and December 31.

1.14 Calendar Year

The term “Calendar Year” shall mean the period of time beginning on January 1 and ending December 31, except for the first year which shall begin on the Effective Date and end on December 31.

1.15 cGMP

The term “**cGMP**” means the regulatory requirements for current good manufacturing practices promulgated by the FDA under the FD&C Act, 21 C.F.R. §§ 210, 211 and 600 et seq. and under the PHS Act, 21 C.F.R. §§ 600-610, as the same may be amended from time to time and with respect to the Product, the corresponding or similar laws, rules and regulations of those jurisdictions in which the Product is sold.

1.16 Change of Control

The term “Change of Control” shall mean, with respect to a Party: (a) the acquisition by any Third Party of beneficial ownership of fifty percent (50%) or more of the then outstanding common shares or voting power of such Party, other than acquisitions by employee benefit plans sponsored or maintained by such Party; (b) the consummation of a business combination involving such Party, unless, following such business combination, the stockholders of such Party immediately prior to such business combination beneficially own directly or indirectly more than fifty percent (50%) of the then outstanding common shares or voting power of the entity resulting from such business combination; or (c) the sale of all or substantially all of such Party’s assets or business relating to the subject matter of the Agreement; provided, however, that notwithstanding (a) through (c) above, a sale or issuance of a Party’s securities in an equity financing for capital raising purposes, including a public offering of securities, shall not constitute a Change of Control.

1.17 Change of Control Group

The term “Change of Control Group” shall mean with respect to a Party, the person or entity, or group of persons or entities, that is the acquirer of, or a successor to, a Party in connection with a Change of Control, together with affiliates of such persons or entities that are not Affiliates of such Party immediately prior to the completion of such Change of Control of such Party.

1.18 Clinical Study

The term “Clinical Study” shall mean a Phase I Study, Phase II Study or a Phase III Study, as applicable.

1.19 CMO

The term “CMO” shall mean a Third Party contract manufacturing organization.

1.20 Combination Product

The term “Combination Product” shall mean

a) a single pharmaceutical formulation containing as its active ingredients both a Compound and one or more other therapeutically or prophylactically active ingredients,

b) [***] or

c) [***]

in each case, including all dosage forms, formulations, presentations, line extensions, and package configurations. All references to Product in this Agreement shall be deemed to include Combination Product.

1.21 Commercially Reasonable Efforts

The term "Commercially Reasonable Efforts" shall mean, [***]. It is understood that such product potential may change from time to time based upon changing scientific, business and marketing and return on investment considerations.

[***].

1.22 Companion Diagnostic

The term "Companion Diagnostic" shall mean any product that is used for predicting or monitoring the response of a human being to treatment with a Product [***].

1.23 Completion

The term "Completion" shall mean the availability of the final study report.

1.24 Composition of Matter Claim

The term "Composition of Matter Claim" shall mean, for a given Product in a given country of the Territory, a Valid Claim of an Atea Patent Right that Covers the Compound per se that is included in such Product.

1.25 Compound

The term "Compound" shall mean the Lead Compound and each Back-up Compound.

1.26 Compulsory Sublicense Compensation

The term "Compulsory Sublicense Compensation" shall mean, for a given country or region in the Territory, the compensation paid to Roche by a Third Party (a "**Compulsory Sublicensee**") under a license or sublicense of Atea Patent Rights and Joint Patent Rights granted to the Compulsory Sublicensee (the "**Compulsory Sublicense**") through the order, decree or grant of a governmental authority having competent jurisdiction in such country or region, authorizing such Third Party to manufacture, use, sell, offer for sale, import or export a Product in such country or region.

1.27 Confidential Information

The term "Confidential Information" shall mean any and all information, data or know-how (including Know-How), whether technical or non-technical, oral or written, that is disclosed by one Party or its Affiliates ("**Disclosing Party**") to the other Party or its Affiliates ("**Receiving Party**"). Confidential Information shall not include any information, data or know-how that:

(i) was generally available to the public at the time of disclosure, or becomes available to the public after disclosure by the Disclosing Party other than through fault (whether by action or inaction) of the Receiving Party or its Affiliates,

(ii) can be evidenced by written records to have been already known to the Receiving Party or its Affiliates prior to its receipt from the Disclosing Party without obligations of confidentiality,

(iii) is obtained at any time lawfully from a Third Party under circumstances permitting its use or disclosure,

(iv) is developed independently by the Receiving Party or its Affiliates as evidenced by written records other than through knowledge of Confidential Information of the Disclosing Party, or

(v) is approved in writing by the Disclosing Party for release by the Receiving Party.

The terms of this Agreement shall be considered Confidential Information of both Parties. For purposes of this Agreement, Confidential Information of a Party shall include any information disclosed by or on behalf of such Party pursuant to the Non-Disclosure Agreement between the Parties dated [***] (the "**NDA**").

1.28 Continuation Election Notice

The term “Continuation Election Notice” shall mean the notice Atea provides to Roche under Section 19.3.1 describing (i) Atea’s *bona fide* intentions to continue ongoing development and commercialization of Product(s) and (ii) Atea’s request for Roche’s continuation of activities during the termination period or transfer of the data, material and information relating to the Product(s) in accordance with Section 19.3.1.

1.29 Control

The term “Control” shall mean (as an adjective or as a verb including conjugations and variations such as “Controls” “Controlled” or “Controlling”) (a) with respect to Patent Rights or Know-How, the possession by a Party of the ability to grant a license or sublicense of such Patent Rights or Know-How without violating the terms of any agreement or arrangement between such Party and any other party and (b) with respect to proprietary materials, the possession by a Party of the ability to supply such proprietary materials to the other Party as provided herein without violating the terms of any agreement or arrangement between such Party and any other party.

1.30 Cover

The term “Cover” shall mean (as an adjective or as a verb including conjugations and variations such as “Covered,” “Coverage” or “Covering”) that the developing, making, using, offering for sale, promoting, selling, exporting or importing of a given compound, formulation or product would infringe a Valid Claim in the absence of a license under or ownership of Patent Rights including such Valid Claim under this Agreement. [***]

1.31 COVID19

The term “COVID19” shall mean the disease caused by the causative agent SARS-CoV-2.

1.32 Drug Product

The term “Drug Product” shall mean a Product formulated and filled (if applicable) that meets the applicable Specifications.

1.33 Drug Substance

The term “Drug Substance” shall mean drug substance of Product in formulated bulk form that meets the applicable Specifications.

1.34 Effective Date

The term “Effective Date” shall mean October 21, 2020.

1.35 EU

The term “EU” shall mean the European Union and all its then-current member countries but including in any case [***] regardless of whether they are then-current member countries.

1.36 Excluded Claim

The term “Excluded Claim” shall mean a dispute, controversy or claim between the Parties that concerns (a) [***], or (b) [***].

1.37Expert

The term “Expert” shall mean a person with no less than [***] years of pharmaceutical industry experience and commercial expertise having occupied at least [***] but excluding [***]. Such person shall be fluent in the English language.

1.38 FDA

The term “FDA” shall mean the Food and Drug Administration of the United States of America.

1.39 FDCA

The term “FDCA” shall mean the Food, Drug and Cosmetics Act.

1.40 Field

The term “Field” shall mean all pharmaceutical, medical and diagnostic uses, excluding the HCV Combination Use with respect to a Lead Compound, (the “**Excluded Field**”).

1.41 First Commercial Sale

The term “First Commercial Sale” shall mean, on a country-by-country basis, the first invoiced sale of the Product to a Third Party by the Roche Group in a country following the receipt of any Regulatory Approval required for the sale of such Product in such country, or if no such Regulatory Approval is required, the date of the first invoiced sale of a Product to a Third Party by the Roche Group in such country.

1.42 First Generation Process

The term “First Generation Process” shall mean the manufacturing process for Drug Substance that is used by Atea at the Effective Date for development purposes, [***].

1.43 FTE

The term “FTE” shall mean a full-time equivalent person-year, based upon a total of no less than [***] working hours per year, undertaken in connection with the conduct of research in the development or manufacturing activities under this Agreement. [***].

1.44 FTE Costs

The term “FTE Costs” shall mean an amount equal to the product of the applicable standard internal FTE rate (for employees or contract personnel. as applicable) and the number of FTEs performing the applicable activity under and in accordance with the applicable Global Development Plan and the number of FTEs performing the applicable activity included in the definition of Fully Burdened Manufacturing Cost (Section 1.45). The applicable FTE rate for each activity shall be consistent for each Party’s internal FTE rate as consistently applied across such Party’s respective functions, [***]. [***]

1.45 Fully Burdened Manufacturing Cost

The term “Fully Burdened Manufacturing Cost” shall mean with respect to a Product and a Party, the consolidated fully-burdened cost incurred by such Party or any of its Affiliates in manufacturing such Product ([***]) in accordance with this Agreement and calculated using the relevant Party’s Accounting Standards, in bulk, vialed or finished product form as the case may be, including: (a) [***], (i) [***] (ii) [***]; and (b) [***]: [***].

1.46 Generic Product

The term “Generic Product” shall mean a product that is not produced, licensed or owned by the Roche Group that (i) contains a pharmaceutically active ingredient that is the same as the Compound in the Product which is approved through in reliance, in whole or in part, on the prior Regulatory Approval (or on safety or efficacy data submitted in support of the prior Regulatory Approval) of such Product, pursuant to Section 505(j) of the Act (21 U.S.C. 355(j)), or for countries outside the US, any international equivalent laws, and (ii) has the same or substantially the same labelling as the applicable Product for at least one indication of such Product.

1.47 Global Development Plan

The term “Global Development Plan” shall mean the plan of Clinical Studies intended to support Regulatory Approval of the Products in the Field and in the Territory, [***]. The initial Global Development Plan is as attached in Appendix 1.47.

1.48 Global Development Plan Budget

The term “Global Development Plan Budget” shall mean the non-binding, forecasted annual budget for the development activities under the Global Development Plan, [***].

1.49 Handle

The term “Handle” shall mean preparing, filing, prosecuting (including interferences, reissue, re-examination, post-grant reviews, inter-partes reviews, derivation proceedings, opposition and invalidation proceedings) and maintaining.

1.50 HCV Combination Use

The term “HCV Combination Use” shall mean pharmaceutical, medical or diagnostic use of a Compound solely (a) for the hepatitis C virus (“**HCV**”) Indication and (b) where the Compound is used in a product [***].

1.51 HCV Combination Use Studies

The term “HCV Combination Studies” shall mean non-clinical studies, Clinical Studies, Post-Approval Commitment Studies and Phase IV Studies conducted by Atea that relate solely to the HCV Combination Use, [***].

1.52 Hospitalized Patients

The term “Hospitalized Patients” shall mean patients that are treated in hospital institutions providing acute, in-patient medical and surgical treatment and nursing care.

1.53 IFRS

The term “IFRS” shall mean International Financial Reporting Standards.

1.54 IND

The term “IND” shall mean an application as defined in the FDCA and applicable regulations promulgated by the FDA, or the equivalent application to the equivalent agency in any other country or group of countries, the filing of which is necessary to commence clinical testing of the Products in humans.

1.55 Indication

The term “Indication” shall mean a disease (i) for which the Product is indicated for treatment or prophylaxis and (ii) for Products for which Regulatory Approval has been obtained, that is described in the Product label as required by the Regulatory Approval granted by the applicable Regulatory Authority.

1.56 Indirect Taxes

The term “Indirect Taxes” shall mean customs, duties, value added taxes, excise taxes, use taxes and sales taxes, consumption taxes and other similar taxes.

1.57 Initial Year

The term “Initial Year” shall mean the twelve-month period beginning on the Effective Date.

1.58 Initiation

The term “Initiation” shall mean the date that a human is first dosed with the Product in a Clinical Study in the Field approved by the respective Regulatory Authority.

1.59 Insolvency Event

The term “Insolvency Event” shall mean circumstances under which a Party (i) has a receiver or similar officer appointed over all or a material part of its assets or undertaking; (ii) passes a resolution for winding-up (other than a winding-up for the purpose of, or in connection with, any solvent amalgamation or reconstruction) or a court makes an order to that effect or a court makes an order for administration (or any equivalent order in any jurisdiction), which order is not dismissed within thirty (30) days; (iii) enters into any composition or arrangement with its creditors (other than relating to a solvent restructuring); (iv) ceases to carry on business; (v) is unable to pay its debts as they become due in the ordinary course of business.

1.60 Invention

The term “Invention” shall mean an invention that is conceived or first reduced to practice in connection with any activity carried out pursuant to this Agreement. Under this definition, an Invention may be made by employees of Atea solely or jointly with a Third Party (an “**Atea Invention**”), by employees of the Roche Group solely or jointly with a Third Party (a “**Roche Invention**”), or jointly by employees of Atea and employees of the Roche Group with or without a Third Party (a “**Joint Invention**”).

1.61 Joint Know-How

The term “Joint Know-How” shall mean Know-How that is made jointly by employees of Atea and the Roche Group, with or without a Third Party in connection with any activity carried out pursuant to this Agreement.

1.62 Joint Patent Rights

The term “Joint Patent Rights” shall mean all Patent Rights Covering a Joint Invention.

1.63 JOT

The term “JOT” shall mean a joint operating team described in Section 5.8.

1.64 JSC

The term “JSC” shall mean the joint steering committee described in Article 5.

1.65 Know-How

The term “Know-How” shall mean data, knowledge and information, including materials, samples, chemical manufacturing data, toxicological data, pharmacological data, preclinical and clinical data, assays, platforms, formulations, specifications, quality control testing data, that are confidential and necessary or useful for the discovery, manufacture, development or commercialization of Products.

1.66 Lead Compound

The term “Lead Compound” shall mean Atea’s proprietary compound AT-511 currently under development by Atea, as set forth in Appendix 1.66, or [***] AT-527 currently under development by Atea, [***].

1.67 Lead Product

The term “Lead Product” shall mean any product, including without limitation any Combination Product, containing the Lead Compound as pharmaceutically active agent, regardless of the finished form or formulation or dosage.

1.68 Manufacturing Third Party Rights

The term “Manufacturing Third Party Rights” means Patent Rights or other intellectual property rights of a Third Party that are necessary or useful to make Products.

1.69 New Drug Application

The term “New Drug Application” shall mean the application, including all necessary documents, data, and other information concerning a Product, required for Regulatory Approval of the Product as a pharmaceutical product by the applicable Regulatory Authority in any country or group of countries (e.g. the marketing authorization application (MAA) with the EMA/European Commission).

1.70 Net Sales

The term “Net Sales” shall mean, for a Product in a particular period, the amount calculated by subtracting from the Sales of such Product for such period: (i) [***]; (ii) uncollectible amounts accrued during such period based on a proportional allocation of the total bad debts accrued during such period and not already taken as a gross-to-net deduction in accordance with the then currently used IFRS in the calculation of Sales of such Product for such period; (iii) credit card charges (including processing fees) accrued during such period on such Sales and not already taken as a gross-to-net deduction in accordance with the then currently used IFRS in the calculation of Sales of such Product for such period; and (iv) government mandated fees and taxes (excluding income or franchise taxes) and other government charges accrued during such period not already taken as a gross-to-net deduction in accordance with the then currently used IFRS in the calculation of Sales of such Product for such period, including, for example, any fees, taxes or other charges that become due in connection with any healthcare reform, change in government pricing or discounting schemes, or other action of a government or regulatory body. For clarity, no deductions taken in calculating Sales under Section 1.95 may be taken a second time in calculating Net Sales.

1.71 Non-Manufacturing Third Party Rights

The term “Non-Manufacturing Third Party Rights” means Third Party Patent Rights or other intellectual property rights that are necessary or useful to develop, use or sell Products.

1.72 Out of Pocket Expenses

The term “Out of Pocket Expenses” shall mean any [***] out-of-pocket costs or expenses paid or accrued in accordance with the applicable Accounting Standard(s), by or on behalf of a Party or any of its Affiliates during the Agreement Term that are [***] identifiable or [***] allocable to development activities for the Product, in each case in accordance with the Global Development Plan or other applicable plan or activities approved by the JOC. Subject to the foregoing and by way of example, Out of Pocket Expenses may include costs in connection with the following activities:

a) [***];

b) [***];

c) [***]; and

d) [***].

1.73 Out-Patients

The term “Out-Patients” shall mean patients that are not treated in hospital institutions providing acute, in-patient medical and surgical treatment and nursing care.

1.74 Party

The term “Party” shall mean Atea or Roche, as the case may be, and “Parties” shall mean Atea and Roche collectively.

1.75 Patent Product

The term “Patent Product” shall mean any Product containing a Compound that is Covered by a Composition of Matter Claim.

1.76 Patent Rights

The term “Patent Rights” shall mean all rights under any patent or patent application, in any country of the Territory, including any patents issuing on such patent application, and further including any substitution, extension or supplementary protection certificate, reissue, reexamination, renewal, divisional, continuation or continuation-in-part of any of the foregoing.

1.77 Phase I Study

The term “Phase I Study” shall mean a human clinical trial in any country that would satisfy the requirements of 21 C.F.R. § 312.21(a) (FDCA), as amended from time to time, and the foreign equivalent thereof.

1.78 Phase II Study

The term “Phase II Study” shall mean a human clinical trial, for which the primary endpoints include a determination of dose ranges or a preliminary determination of efficacy in patients being studied as described in 21 C.F.R. § 312.21(b) (FDCA), as amended from time to time, and the foreign equivalent thereof.

1.79 Phase III Study

The term “Phase III Study” shall mean a human clinical trial that is prospectively designed to demonstrate statistically whether a product is safe and effective for use in humans in a manner sufficient to obtain regulatory approval to market such product in patients having the disease or condition being studied as described in 21 C.F.R. § 312.21(c) (FDCA), as amended from time to time, and the foreign equivalent thereof.

1.80 Phase IV Study

The term “Phase IV Study” means a human clinical study with respect to any approved Indication in a country commenced after Regulatory Approval for that Indication has been received for such product in such Indication in such country, excluding Post-Approval Commitment Studies.

1.81 Post-Approval Commitment Studies

The term “Post-Approval Commitment Studies” means clinical studies mandated by a Regulatory Authority to be performed after Regulatory Approval of a Product, as a condition of such Regulatory Approval.

1.82 Product

The term “Product” shall mean any product, including without limitation any Combination Product, containing a Compound as a pharmaceutically active agent, regardless of their finished forms or formulations or dosages. One Product may be distinguished from another Product by the Compound being a distinctive active pharmaceutical ingredient. In the instance where more than one distinctive active pharmaceutical ingredient is contained in a Compound, one Product may be distinguished from another Product if at least one of the distinctive active pharmaceutical ingredients is different.

1.83 Qualifying Second Generation Batch

The term "Qualifying Second Generation Batch" shall mean the manufacture using the Second Generation Process of at least [***] of Drug Substance, which shall (i) meet the same specifications as applicable to the First Generation Process, (ii) be compliant with Roche standard GMP requirements and (iii) outline the synthesis route towards the Second Generation Process for the manufacturing of the campaign of [***] (the success criteria for such synthesis route are outlined in Appendix 8.3.3 and shall serve as orientation therefor).

1.84 Regulatory Approval

The term "Regulatory Approval" shall mean any approvals (including pricing and reimbursement approvals), licenses, registrations or authorizations by a Regulatory Authority, necessary for the manufacture and sale of a Product in the Field in a regulatory jurisdiction in the Territory.

1.85 Regulatory Authority

The term "Regulatory Authority" shall mean any national, supranational (e.g., the European Commission, the Council of the European Union, the European Medicines Agency), regional, state or local regulatory agency, department, bureau, commission, council or other governmental entity including the FDA, in each country involved in the granting of regulatory approval (including pricing and reimbursement approvals) for the Product.

1.86 Respective Territory

The term "Respective Territory" shall mean the Roche Territory with respect to Roche and the Atea Territory with respect to Atea.

1.87 Roche Group

The term "Roche Group" shall mean collectively Roche, its Affiliates and its Sublicensees.

1.88 Roche Inability to Supply

The term "Roche Inability to Supply" means, [***], Atea's reasonable belief that Roche will be unable to deliver to Atea [***] supply of Product to meet the quantities set forth in the then-current Demand Forecast Plan for the Product allocated for commercialization purposes in the Atea Territory, despite (i) [***], and (ii) [***], and (iii) [***].

1.89 Roche Know-How

The term "Roche Know-How" shall mean all Know-How that Roche Controls during the Agreement relating to or arising from the discovery, manufacture, development or commercialization of or necessary or reasonably useful to discover, manufacture, develop or commercialize a Product.

1.90 Roche Patent Rights

The term "Roche Patent Rights" shall mean the Patent Rights that Roche Controls, relating to or arising from the discovery, manufacture, development or commercialization of or Covering a Product.

1.91 Roche Royalty Territory

The term "Roche Royalty Territory" shall mean the Roche Territory, excluding the Royalty Exclusion Countries.

1.92 Roche Territory

The term "Roche Territory" shall mean all countries other than the US.

1.93 Royalty Exclusion Countries

The term “Royalty Exclusion Countries” for a Calendar Year shall mean the countries [***].

1.94 Royalty Term

The term “Royalty Term” shall mean, with respect to a Product and for a given country, the period of time commencing on the date of First Commercial Sale of the Product in such country and ending on the later of the date that is (a) ten (10) years after the date of the First Commercial Sale of the Product in such country, or (b) the expiration of the last to expire Atea Patent Right containing a Composition of Matter Claim. With regard to the calculation of the ten (10) year period, the EU shall be considered as one country.

1.95 Sales

The term “Sales” shall mean, for a Product in a particular period, the sum of (i) and (ii):

(i) the amount stated in the Roche Holding AG “Sales” line of its externally published audited consolidated financial statements with respect to such Product for such period [***]. This amount reflects the gross invoice price at which such Product was sold or otherwise disposed of (other than for use as clinical supplies or free samples) by Roche and its Affiliates to such Third Parties [***] in such period reduced by gross-to-net deductions, if not previously deducted from such invoiced amount, taken in accordance with the then currently used IFRS.

[***]

For purposes of clarity, [***] any given deduction shall be taken only under one of subsections (a) through (e), and only once in calculating Sales.

(ii) [***]

1.96 SARS-COV-2

The term “SARS-COV-2” shall mean the virus known as the severe acute respiratory syndrome coronavirus 2.

1.97 Second Generation Process

The term “Second Generation Process” shall mean the manufacturing process for Drug Substance that Atea conceptualized and started to develop at the Effective Date, as outlined in Appendix 1.97.

1.98 Stockpiling

The term “Stockpiling” shall mean activities conducted by a governmental authority to address public health emergencies by purchasing and maintaining inventories of Product for distribution and use in responding to such emergencies.

1.99 Sublicensee

The term “Sublicensee” shall mean an entity to which Roche has licensed rights (through one or multiple tiers), other than through a Compulsory Sublicense, pursuant to this Agreement.

1.100 Territory

The term “Territory” shall mean the Roche Territory and the Atea Territory.

1.101 Third Party

The term "Third Party" shall mean a person or entity other than (i) Atea or any of its Affiliates or (ii) a member of the Roche Group.

1.102 US

The term "US" shall mean the United States of America and its territories and possessions.

1.103 US$

The term "US$" shall mean US dollars.

1.104 Valid Claim

The term "Valid Claim" shall mean: (i) with respect to a claim in any unexpired and issued patent within the Atea Patent Rights, that such claim has not been disclaimed, revoked or held invalid by a final nonappealable decision of a court of competent jurisdiction or government agency, or (ii) with respect to a claim in any pending patent application within the Atea Patent Rights, that such claim has been filed and prosecuted in good faith and no more than [***] years have elapsed from the earliest priority date of such claim.

1.105 Additional Definitions

Each of the following definitions is set forth in the Section of this Agreement indicated below:

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2. Grant of License

2.1 Licenses

2.1.1 License Grant to Roche

Subject to the terms and conditions of this Agreement, Atea hereby grants to Roche under the Atea Patent Rights and Atea Know-How and Atea's interest in the Joint Patent Rights and Joint Know-How:

(a) an exclusive (even as to Atea) right and license to research, have researched, develop, have developed, register, have registered, use, have used, import, have imported, export, have exported, market, have marketed, distribute, have distributed, sell, have sold, offer for sale, and have offered for sale Compounds, Products and Companion Diagnostics in the Field in the Roche Territory, including the right to sublicense pursuant to Section 2.2; provided that Atea retains the right to develop, manufacture and commercialize Compound and Product for the Retained Indications for the purposes set forth in Section 2.1.4;

(b) a non-exclusive right and license to make, have made, import, have imported, export, have exported Compounds, Products and Companion Diagnostics in the Field in the Territory, including the right to sublicense pursuant to Section 2.2; and

(c) a non-exclusive right and license to research, have researched, develop and have developed Compounds, Products and Companion Diagnostics in the Field and in the Atea Territory, including the right to sublicense pursuant to Section 2.2.

The exclusivity of the above license is subject to the right of Atea and its respective Affiliates to conduct any activities expressly contemplated by this Agreement.

2.1.2 License Grant to Atea

Subject to the terms and conditions of this Agreement, Roche hereby grants to Atea under the Roche Patent Rights and Roche Know-How and Roche's interest in the Joint Patent Rights and Joint Know-How:

(a) an exclusive (even as to Roche, except as set forth in Sections 2.1.1(b) and 2.1.1(c)) right and license to distribute, have distributed, register, have registered, sell, have sold, offer for sale, and have offered for sale Compounds and Products in the Atea Territory, including the right to sublicense pursuant to Section 2.2;

(b) a non-exclusive right and license to research, have researched, develop, have developed, use, have used, import, have imported, export, have exported, market, and have marketed, Compounds and Products in the Atea Territory, including the right to sublicense pursuant to Section 2.2;

(c) a non-exclusive right and license, including the right to sublicense pursuant to Section 2.2, to practice any process improvements arising in the course of the manufacture of the Drug Substance or the Drug Product by or on behalf of Roche, its Affiliates or Sublicensees, solely in case of a Roche Inability to Supply, and to make, have made, import, have imported, export, have exported, market, have marketed, distribute, have distributed, sell and have sold Compounds and Products in the Atea Territory and, solely in the Excluded Field (whether or not there is a Roche Inability to Supply), the Roche Territory, and anywhere in the Territory to manufacture or have manufactured Compound and Product for the purposes set forth in Section 2.1.4; and

(d) a non-exclusive right and license to research, have researched, develop and have developed Compounds and Products in the Field and in the Roche Territory, and anywhere in the Territory for purposes set forth in Section 2.1.4, including the right to sublicense pursuant to Section 2.2.

2.1.3 Excluded Affiliates

Notwithstanding anything to the contrary in this Article 2 or elsewhere in this Agreement, no licenses or rights are granted to Atea under any information, data, proprietary materials or other intellectual property rights whether or not patentable that are owned or controlled by [***].

2.1.4 Retained Rights

For clarity, Atea retains the exclusive ownership and right to use any compound that was generated by or on behalf of Atea, or that is otherwise Covered by intellectual property rights Controlled by Atea, at the Effective Date or during the Agreement Term in the Excluded Field.

Notwithstanding anything to the contrary in this Agreement, Atea retains the sole right to develop, manufacture and commercialize Compounds and Products in the Atea Territory for the treatment of Dengue Fever, Japanese Encephalitis, West Nile Virus, Yellow Fever and/or Zika (the "**Retained Indications**") in the Atea Territory, and to develop and manufacture Compounds and Products in the Roche Territory for the Retained Indications. Atea will notify Roche in writing promptly [***] for the Retained Indication in the Atea Territory. For [***] months after Roche's receipt of such notice from Atea, the Parties will negotiate in good faith an amendment to this Agreement specifying the terms pursuant to which Roche will commercialize the Product in the Roche Territory for the Retained Indications, except if Roche decides to offer such commercialization right to Atea. Unless and until the Parties enter into such amendment, neither Party will have the right to commercialize the Product in the Roche Territory for the Retained Indications.

2.2 Sublicense

2.2.1 Right to Sublicense to its Affiliates

Each Party shall have the right to grant sublicenses to its Affiliates (through multiple tiers), and, as to Roche, [***] under its rights granted under Section 2.1 without prior approval of the other Party.

2.2.2 Right to Sublicense to Third Parties

Each Party and its Affiliates shall have the right to grant written sublicenses to non-Affiliate entities (through multiple tiers) under its rights granted under Section 2.1 without prior approval of the other Party. Roche shall inform Atea promptly after the signature of any sublicense agreement it enters into under this Section 2.2.2.

2.2.3 Requirements for Sublicenses

Each sublicense shall be consistent in all material respects with the terms and conditions of the Agreement, provided that the sublicensing Party shall be responsible for the payment of all amounts due hereunder, and for all other obligations of its sublicensees under the Agreement as if such obligations were those of such Party.

2.3 Atea Right to Request U.S. Co-Promotion

Atea shall have a one-time option right to request that Roche co-promote each Product (other than for the Retained Indications), on a Product-by-Product basis, in the US on a royalty basis (each, a "**Co-Promotion Option**"), subject to the provisions of this Section 2.3, and conditioned on Roche and Atea or their respective Affiliates entering into a co-promotion agreement consistent with this Section 2.3. For purposes of this Agreement, "**co-promote**" and "**co-promotion**" shall refer to marketing, promotion, detailing and advertisement of a Product by the Parties under the relevant Regulatory Approvals and the same trademark(s). "Co-promote" and "co-promotion" shall not mean the sale, contracting or distribution of a Product. Additional supportive customer and field activities may be included in the agreement even if they are not related to promotion (i.e. medical or patient support services). Atea may exercise its Co-Promotion Option with respect to each Product by giving written notice thereof to Roche at any time at least [***] prior to expected Regulatory Approval of such Product in the US. Upon Atea's exercise of its Co-Promotion Option with respect to a Product the Parties shall negotiate in good faith and enter into a written co-promotion agreement (the "**Co-Promotion Agreement**"). In addition to any other terms agreed to by the Parties, the Co-Promotion Agreement shall contain the terms set forth in Appendix 2.3 hereto and other terms typically contained in agreements or the co-promotion of similar products in the US. Upon Atea exercising the Co-Promotion Option in accordance with this Section 2.3, the Parties shall coordinate all sales efforts and field activities in the US under the direction of the JSC, and such efforts and activities shall be more fully described in the Co-Promotion Agreement. Atea shall have the right to co-promote any Product with any Third Party, or to commercialize such Product itself, in the Atea Territory, unless and until Atea exercises its Co-Promotion Option and the Parties enter into the Co-Promotion Agreement. If Atea exercises its right to co-promote or commercialize with a Third Party, then its Co-Promotion Option expires on the date any such Third Party agreement takes effect.

3. Subcontracting

Atea shall have the right to subcontract the performance of any of its activities under the Agreement (including the activities described under the Global Development Plan and, if applicable, in the Co-Promotion Agreement), provided that (a) Atea shall be and remain responsible and liable for the performance of any such activities by any such subcontractor and (b) such subcontractor must be bound by written obligations (i) of nondisclosure and non-use that are as protective of Roche's Confidential Information as this Agreement and (ii) to assign or license and transfer to Atea all right, title and interest to any Invention that is developed or, conceived and reduced to practice by such subcontractor that is related to the Compound or Product.

Atea may not subcontract out its activities under the Global Development Plan to any Third Party other than those Third Parties listed on Appendix 3, which Appendix lists Third Party subcontractors of Atea existing as of the Effective Date, or pursuant to the following procedure: (i) Atea shall notify [***] (which notice may be provided via e-mail) of any such proposed Third Party subcontractor and the scope of work proposed to be subcontracted (such notice, a "**Subcontractor Notice**"); (ii) Roche may notify Atea of any reasonable concerns with respect to such proposed subcontractor, if any, as expeditiously as practical but in no event later than [***] days of receipt of such Subcontractor Notice; (iii) Atea shall consider any such concerns in good

faith; and (iv) if thereafter Atea continues to desire to use such Third Party subcontractor the matter shall be referred to the JOC for discussion and resolution. Notwithstanding the foregoing, Atea shall have the right, without needing to so notify [***] and seek Roche's prior approval, to subcontract non-crucial activities under the Global Development Plan to Third Parties that would reasonably be acceptable to Roche if the total fees under the subcontract agreement do not exceed [***] and the activities being subcontracted are [***].

Roche shall have the right to subcontract the work performed under this Agreement without prior approval of Atea, provided that (A) Roche shall be and remain responsible and liable for the performance of any such activities by any such subcontractor and (B) such subcontractor must be bound by written obligations (i) of nondisclosure and non-use that are as protective of Atea's Confidential Information as this Agreement and (ii) to assign or license and transfer to Roche all right, title and interest to any Invention that is developed or, conceived and reduced to practice by such subcontractor that is related to the Compound or Product.

4. Exclusivity

Until [***] and subject to Section 2.1.4, Atea shall work exclusively with Roche with regard to Compounds and Products and will not, either on its own or in collaboration with a Third Party, research, develop or commercialize Compounds or Products in the Field other than pursuant to this Agreement, provided that the foregoing shall not limit Atea's ability to engage subcontractors as provided in Section 3 or, in case Atea does not exercise its Co-Promotion Option as provided in Section 2.3, to engage co-promotion partners or other Third Parties to conduct commercialization activities in the Atea Territory.

5. Governance

5.1 Joint Steering Committee

Promptly after the Effective Date of this Agreement, the Parties shall establish a JSC to oversee the development, marketing and commercialization activities under this Agreement.

5.2 Members

The JSC shall be composed of up to [***] persons ("**Members**"). Roche and Atea each shall be entitled to appoint up to [***] Members with appropriate seniority and functional expertise. Each Party may replace any of its Members and appoint a person to fill the vacancy arising from each such replacement. A Party that replaces a Member shall notify the other Party at least [***] days prior to the next scheduled meeting of the JSC. Both Parties shall use reasonable efforts to keep an appropriate level of continuity in representation. Both Parties may invite a reasonable number of additional experts or advisors to attend part or the whole JSC meeting with prior notification to the JSC provided that such experts or advisors are bound by written obligations (i) of nondisclosure and non-use that are as protective of each Party's Confidential Information as this Agreement and (ii) to assign or license and transfer to the relevant Party all right, title and interest to any Invention that is developed or, conceived and reduced to practice by such experts or advisors that is related to the Compound or Product. Members may be represented at any meeting by another person designated by the absent Member. The JSC shall be co-chaired by a Member from Atea and a Member from Roche. The Atea and Roche co-chairs will alternate each JSC meeting the lead co-chair responsibilities associated with that meeting (each, a "**Lead Co-Chairperson**").

5.3 Responsibilities of the JSC

The JSC shall have the responsibility and authority to:

(a) manage the overall strategic alignment between the Parties under this Agreement and maintain the relationship between the Parties;

(b) approve initial Global Development Plan Budget (including FTE allocations by each Party) created by the JOC;

(c) approve any development matters referred to the JSC by the JOC (examples may include but are not limited to material Global Development Plan updates, material Global Development Plan Budget updates, material global medical affairs plan updates, and publication strategy and updates thereto), if these matters are referred to the JSC;

(d) review and discuss the initial plan for commercialization of the Product in the Field in the Territory referred to the JSC by the JOC;

(e) approve the initial Demand Forecast Plan created by the JMC;

(f) review and approve the manufacturing process recommended by the JMC (i.e., First Generation Process or Second Generation Process) that shall be used for supplying future commercial material for Product;

(g) approve any manufacturing matters that are referred to the JSC by the JMC, at the discretion of the JMC;

(h) discuss and review updates on development of Compounds and Products for the Retained Indications;

(i) create or disband JOTs as deemed appropriate;

(j) approve any efforts to develop Back-Up Compounds as an alternative to the Lead Compound;

(k) establish and delegate specifically defined duties to the JOC or JMC;

(l) establish and set expectations and mandates for JOTs;

(m) oversee the JOTs;

(n) attempt to resolve any disputes, including those referred to it for resolution by the JOC and/or the JMC, on an informal basis; and

(o) perform such other tasks as agreed by the Parties.

The JSC shall have no responsibility and authority other than that expressly set forth in this Section.

5.4 Meetings

The Lead Co-Chairperson or his/her delegate will be responsible for sending invitations and agendas for all JSC meetings to all Members at least [***] days before the next scheduled meeting of the JSC. The venue for the meetings shall be agreed by the JSC. The JSC shall hold meetings at least once every [***], either in person or by tele-/video-conference, and in any case as frequently as the Members of the JSC may agree shall be necessary. The Alliance Director of each Party may attend the JSC meetings as a permanent participant but shall not be a Member unless appointed as such.

5.5 Minutes

The Lead Co-Chairperson will be responsible for designating a Member to record in reasonable detail and circulate draft minutes of JSC meetings to all members of the JSC for comment and review within [***] days after the relevant meeting. An Atea Member will fulfill the role of drafting the minutes for meetings in which an Atea Member is the Lead Co-Chairperson and a Roche

Member will fulfill the role of drafting the minutes for meeting in which a Roche Member is the Lead Co-Chairperson. The Members of the JSC shall have [***] days to provide comments. The Party preparing the minutes shall incorporate timely received comments and distribute finalized minutes to all Members of the JSC within [***] days of the relevant meeting. The Lead Co-Chairperson shall approve the final version of the minutes before its distribution.

5.6 Decisions

5.6.1 Decision Making Authority

The JSC shall decide matters within its responsibilities set forth in Section 5.3, as well as on any matter that is referred to it by the JOC and/or the JMC for resolution pursuant to Section 5.7.5.

5.6.2 Consensus; Good Faith

The Members of the JSC shall act in good faith to cooperate with one another and seek agreement with respect to issues to be decided by the JSC. The Parties shall endeavor to make decisions by consensus.

5.6.3 Failure to Reach Consensus

If the JSC is unable to decide a matter by consensus, then:

(a) Atea shall have final decision authority on any matter relating to: (i) [***]; (ii) [***]; (iii) [***]; (iv) [***]; (v) [***]; and (vi) [***];

(b) Roche shall have final decision authority on any matter relating to: (i) [***]; (ii) [***]; (iii) [***]; (iv) [***]; (v) [***]; (vi) [***]; (vii) [***]; and (viii) [***];

(c) If the JSC is unable to resolve any other matters not addressed in the foregoing clause (a)—(b), such matter shall be submitted for resolution pursuant to Section 21.2.

5.7 Subcommittees (JOC and JMC)

5.7.1 Formation in general; Authority

The JSC will establish and delegate specifically-defined duties to the JOC and the JMC (each a "**Subcommittee**"). Each Subcommittee and its activities will be subject to the oversight of, and will report to, the JSC. No Subcommittee may exceed its authorities specified for the JSC in this Article 5 (Governance). Any disagreement between the representatives of the Parties on a Subcommittee may, after a reasonably trying to solve such disagreement, at the discretion of either Party, be referred to the JSC for resolution in accordance with Section 5.6 (Decisions).

5.7.2 Subcommittee Leadership and Meetings

Atea will designate a co-chairperson of each Subcommittee and Roche will designate a co-chairperson of each Subcommittee, each of whom will be a Party's representative who is a member of such Subcommittee. Each [***], the co-chairpersons of each Subcommittee will alternate serving in the role of "lead co-chairperson." The lead co-chairperson for the first Calendar Year will be from [***]. The lead co-chairperson or his or her designee will be responsible for calling meetings, preparing and circulating an agenda in advance of each meeting, and preparing and issuing minutes of each meeting within [***] days thereafter. Such minutes will be finalized upon endorsement of all Subcommittee members. Each Party may replace its representatives and co-chairpersons on each such Subcommittee at any time upon written notice to the other Party. Each Subcommittee will hold meetings at such times as it elects to do so and at such locations as the Parties may agree upon or, if agreed by the Parties, by audio or video teleconference, and will designate one of the participants to minute the meetings. Each Party will be responsible for all of its own expenses of participating in any Subcommittee meeting.

5.7.3 Joint Operating Committee.

5.7.3.1 Formation and Purpose of the JOC

Within [***] days after the Effective Date, Atea and Roche will establish a Joint Operating Committee ("**JOC**"), which will be a Subcommittee of the JSC and will have the responsibilities set forth in this Article 5 (Governance). The JOC will dissolve upon completion of all development activities and medical affairs activities with respect to the Product and the expiration of the Royalty Term.

5.7.3.2 Membership of the JOC

Each Party will designate up to [***] representatives with appropriate knowledge, expertise, and decision-making authority to serve as members of the JOC; *provided* that each Party shall have the same number of representatives as the other Party. Each Party may replace its JOC representatives and co-chairpersons at any time upon written notice to the other Party. The Alliance Director of each Party (or his or her designee) may attend meetings of the JOC as a non-voting participant.

5.7.3.3 Specific Responsibilities of the JOC

The responsibilities of the JOC will be to:

(a) approve amendments to the Global Development Plan and the Global Development Plan Budget;

(b) review and oversee the execution of the Global Development Plan and relating activities;

(c) facilitate the exchange of information between the Parties with respect to the development and registration of the Compounds and the Products in the Field and in the Territory;

(d) discuss and align on strategies for investigator-sponsored studies, and approve such studies, with respect to the Compounds and the Products in the Field and in the Territory and any development activities with respect to any delivery device for the Products for incorporation in the Global Development Plan;

(e) review, discuss and refer to the JSC the initial plan for commercialization of the Product in the Field in the Territory, as well as any later updates thereto;

(f) develop, approve, and adapt publication plans and medical affairs plans for the Compounds and Products in the Field, as needed;

(g) facilitate the exchange of information between the Parties with respect to the commercialization of the Compounds and the Products in the Field and in the Territory;

(h) discuss and consider in good faith any global guidelines and strategy for pricing (which shall be non-binding);

(i) coordinate with JOTs;

(j) attempt to resolve any disputes arising within its jurisdiction on an informal basis;

(k) discuss and evaluate if any disagreements relating to development or commercialization within the JOC's responsibility should be referred to the JSC (for clarity, each Party has the right to refer any disagreement to the JSC that is not resolved at the JOC, even without the other Party's consent); and

(l) perform such other tasks as agreed by the Parties.

The JOC shall have no responsibility and authority other than that expressly set forth in this Section.

5.7.4 Joint Manufacturing Committee.

5.7.4.1 Formation and Purpose of the JMC

Within [***] days after the Effective Date, the Parties will establish a Joint Manufacturing Committee (the "**JMC**"), which will be a Subcommittee of the JSC and will have the responsibilities set forth in this Article 5 (Governance). The JMC will dissolve upon the completion or earlier termination of all manufacturing activities under the Supply Agreement.

5.7.4.2 Membership of the JMC

Each Party will designate up to [***] representatives with appropriate knowledge, expertise, and decision-making authority to serve as members of the JMC; *provided* that each Party shall have the same number of representatives as the other Party. Each Party may replace its JMC representatives and co-chairpersons at any time upon written notice to the other Party. The Alliance Director of each Party (or his or her designee) may attend meetings of the JMC as a non-voting participant.

5.7.4.3 Specific Responsibilities of the JMC

The responsibilities of the JMC will be to:

(a) prepare the initial Demand Forecast Plan for JSC approval, and review and approve any subsequent updates;

(b) develop, approve, and adapt capacity plans, manufacturing plans, and any other plans related to manufacturing of the Compounds and Products, as needed;

(c) review and oversee the execution of the Demand Forecast Plan, and any other plans, if applicable;

(d) review and oversee the Parties' respective activities in First Generation Process Development, Early Second Generation Process Development, Later Second Generation Process Development and Commercial Scale-Up, and recommend to the JSC which process (First Generation Process or Second Generation Process) shall be used for supplying future commercial material for Product;

(e) discuss and decide on a hand-over plan of supply responsibilities pursuant to Section 8.1.1;

(f) monitor and implement the technology transfer to Roche pursuant to Section 8.1.3;

(g) discuss, align, consolidate, update and approve the Demand Forecast Plan as needed;

(h) coordinate with JOTs;

(i) attempt to resolve any disputes arising within its jurisdiction on an informal basis;

(j) discuss and evaluate if any disagreements relating to manufacturing matters should be referred to the JSC (for clarity, each Party has the right to refer any disagreement to the JSC that is not resolved at the JMC, even without the other Party's consent); and

(k) perform such other tasks as agreed by the Parties.

The JMC shall have no responsibility and authority other than that expressly set forth in this Section.

5.7.5 Decision-Making of the Subcommittees

Each Party shall have an equal number of representatives on the Subcommittees. The Subcommittees shall strive to take any decisions on a unanimous basis. If any Subcommittee cannot reach unanimous agreement using good faith efforts on any matter within their respective scope of authority at the meeting at which such matter was discussed or if a meeting of such Subcommittee is not held within a reasonable period of time or the meeting minutes are not finalized in due time, then a Party may refer such matter to the JSC for resolution.

5.8 Joint Operational Teams

The JSC shall have the right to establish JOTs, which may include but will not be limited to a Development JOT.

5.9 Information Exchange

Atea and Roche shall exchange the information in relation to its activities under this Agreement through the JSC and the Subcommittees, and Atea and Roche may ask reasonable questions in relation to the above information and offer advice in relation thereto and each Party shall give due consideration to the other Party's input. The JSC may determine other routes of information exchange.

5.10 Alliance Director

Each Party shall appoint one person to be its point of contact with responsibility for facilitating communication and collaboration between the Parties (each, an "**Alliance Director**"). The Alliance Directors shall be permanent participants of the JSC meetings (but not Members of the JSC) and may attend JOT meetings as appropriate. The Alliance Directors shall facilitate resolution of potential and pending issues and potential disputes to enable the JSC to reach consensus and avert escalation of such issues or potential disputes.

5.11 Limitations of Authority

The JSC, JOC and JMC shall have no authority to amend or waive any terms of this Agreement.

5.12 Expenses

Each Party shall be responsible for its own expenses including travel and accommodation costs incurred in connection with the JSC, JOC and JMC.

5.13 Lifetime

The JSC shall exist during the Agreement Term, unless earlier discontinued by mutual agreement of the Parties. The lifetime of the JOC and the JMC is described under Section 5.7.3.1 (for the JOC) and Section 5.7.4.1 (for the JMC).

6. Development

6.1 Atea Ongoing Studies

Atea shall, [***], use Commercially Reasonable Efforts to conduct and complete the Atea Ongoing Studies. Atea shall provide Roche [***] updates at interim analysis points and at least once [***] regarding the progress and status of the Atea Ongoing Studies, including [***].

6.2 Global Development Plan

Subject to the terms and conditions of this Agreement, and except as otherwise provided in Article 6, the Parties shall jointly develop the Products in the Territory in accordance with the Global Development Plan and under the governance of the JSC. The responsibility of Roche and Atea to operationalize the global clinical development will be described in the Global Development

Plan. The Global Development Plan shall be regularly amended and updated. Roche and Atea shall each use Commercially Reasonable Efforts to perform their respective tasks and obligations in conducting all activities ascribed to them in the then-current Global Development Plan, in accordance with the time parameters set forth therein. The parties will share the costs associated with activities conducted under the Global Development Plan. FTE Costs and Out of Pocket Expenses incurred by or on behalf of either Party or any of its Affiliates in connection with its activities under the Global Development Plan[***] shall be share equally (50/50) by the Parties, [***]. Neither Party shall pursue Third Party funding for any Clinical Study under the Global Development Plan that is not an Atea Ongoing Study without the approval of the JSC.

The Parties shall disclose and make available to each other all data and information necessary to conduct the development activities under the Global Development Plan. The Parties shall answer any questions reasonably posed by the other Party and provide any information reasonably requested by the other Party.

6.3 Additional Clinical Studies and Other Studies

Prior to initiating a new Clinical Study (including, for the purposes of this Section, any marketing studies, Post-Approval Commitment Studies, and Phase IV Studies for the Product) that is not an Ongoing Atea Study and is not an ongoing Unilateral Study (as defined below) or included in the then-current Global Development Plan, the Party that desires to conduct such Clinical Study (the "**Proposing Party**") shall propose such Clinical Study to the JOC, which proposal shall include a synopsis of the protocol for such Clinical Study and an estimated budget for such Clinical Study. If the JOC agrees that the Parties should conduct such Clinical Study, then the Parties shall amend the Global Development Plan to include such Clinical Study. If the JSC does not agree that the Parties should conduct such Clinical Study, then the Proposing Party shall have the right, but not the obligation, to conduct such Clinical Study at its sole expense (each such Clinical Study, a "**Unilateral Study**"), provided that (i) [***], and (ii) [***]. For clarity, neither Party shall have the obligation to conduct or, except as may be required by Applicable Law or ethical requirements, complete any Unilateral Study.

Notwithstanding anything to the contrary in the foregoing, the Party which is not the Proposing Party, after good faith discussion in the JSC, shall have the right to require the Proposing Party to not conduct a proposed Unilateral Study, if [***] such Unilateral Study [***].

With respect to each Unilateral Study, if the Party not performing such Unilateral Study uses any data or results from such Unilateral Study to obtain, maintain or expand any Regulatory Approval or any pricing or reimbursement for, otherwise includes such data or results in the label for, or uses such data and results to commercialize, a Product in its Respective Territory, then such non-performing Party shall reimburse the Party that performed such Unilateral Study for [***] incurred by or on behalf of such performing Party or any of its Affiliates in connection with such Unilateral Study to the extent such costs are not funded by a Third Party. Notwithstanding the foregoing, the submission of data and results from a Unilateral Study to a Regulatory Authority only for safety reporting purposes in connection with periodic safety reporting or as a courtesy copy shall not result in a reimbursement obligation under this paragraph. The Party not performing the applicable Unilateral Study shall promptly notify the performing Party of any use of the data or results of such Unilateral Study that would result in a reimbursement obligation under this paragraph.

6.4 Intravenously-Administered Formulation of Lead Compound

To the extent the JSC determines that an intravenously-administered formulation of the Lead Compound (an "**IV Lead Compound Formulation**") is required for Clinical Studies for Hospitalized Patients, Roche may develop an IV Lead Compound Formulation. [***]. To the extent the JSC does not endorse the development of an IV Lead Compound Formulation, then Roche may, at its own cost and expense, develop such IV Lead Compound Formulation. In each case, for [***], Atea will supply Roche with GMP API for use in the development of the formulation of the IV Lead Compound Formulation and for clinical supply of IV Lead Compound Formulation as provided in Section 8.1.

6.5 Development Records

Each Party shall maintain records of its activities under the Global Development Plan and for Clinical Studies, Post-Approval Commitment Studies and Phase IV Studies of Product conducted pursuant to this Agreement outside the Global Development Plan (or cause such records to be maintained) in sufficient detail and in good scientific manner as will properly reflect all work done and results achieved by or on behalf of such Party in the performance of the development.

6.6 Back-Up Compounds

The JSC will evaluate from time to time whether any non-clinical or clinical studies should be conducted for Back-Up Compounds. If the JSC determines to pursue development of Back-Up Compounds for potential development if the Lead Compound demonstrates material safety or efficacy concerns, the Parties shall agree on an adjustment to the Global Development Plan and the Global Development Plan Budget to reflect such additional activities.

7. Regulatory

7.1 Responsibility

Atea shall have the right and the responsibility for all regulatory affairs related to Products in the Atea Territory, including the preparation and filing of applications for Regulatory Approval (other than for manufacturing by Roche or its CMO or other Third Party manufacturer) in the Atea Territory (for clarity, for Unilateral Studies conducted by Roche in the Atea Territory, Atea shall transfer responsibility for the conduct of such studies to Roche). Roche shall have the right to participate in all regulatory interactions, as well as in the preparations therefor, as an observer, other than for Products for the Retained Indications, where permitted by such Regulatory Authority. All regulatory filings for all Products in all countries of the Atea Territory (other than regulatory filings for manufacturing by Roche or its CMO or other Third Party manufacturer) and all data related thereto shall be owned by Atea, its Affiliates or licensees.

Atea shall also be solely responsible for all regulatory affairs related to the conduct of the Atea Ongoing Studies until hand-over of responsibility therefor to Roche as determined by the JSC, any Unilateral Studies conducted by Atea in the Roche Territory, and all Clinical Studies of Products in the Roche Territory for the Retained Indications. Atea shall provide reasonable advance notice of any meeting with any Regulatory Authority in the Roche Territory related to the Atea Ongoing Studies or Unilateral Studies conducted by Atea, and Roche shall have the right, at its own discretion, to participate in any such meeting with Regulatory Authorities in the Roche Territory.

Roche shall have the right and the responsibility for all regulatory affairs related to Products in the Roche Territory, including the preparation and filing of applications for Regulatory Approval in the Roche Territory (other than for Unilateral Studies, Clinical Studies for the Retained Indications and, until hand-over of responsibility to Roche as determined by the JSC, Atea Ongoing Studies, in each case conducted by Atea in the Roche Territory). Atea shall have the right to participate in all regulatory interactions, as well as in the preparations therefor, as an observer, where permitted by such Regulatory Authority. All regulatory filings for all Products in all countries of the Roche Territory (other than regulatory filings for the Atea Ongoing Studies conducted by Atea in the Roche Territory prior to hand-over, and all Clinical Studies for the Retained Indications) and all data related thereto shall be owned by Roche, its Affiliates or licensees.

Roche shall also be solely responsible for all regulatory affairs related to the conduct of any Unilateral Studies conducted by Roche in the Atea Territory. Roche shall provide reasonable advance notice of any meeting with any Regulatory Authority in the Atea Territory related to the Unilateral Studies conducted by Roche, and Atea shall have the right, at its own discretion, to participate in any such meeting with Regulatory Authorities in the Atea Territory.

At a date to be defined by the JSC, Atea shall transfer to Roche all (i) regulatory filings in its possession and control relating to the Product in the Field in the Roche Territory (other than for Unilateral Studies conducted by Atea in the Roche Territory, and Clinical Studies of Product in the Retained Indications in the Roche Territory), (ii) copies of all relevant historical clinical data for the Product in the Field in the Roche Territory, (iii) copies of all material correspondence with the Regulatory Authorities for the Product in the Field in the Roche Territory, (iv) copies of regulatory dossiers containing information necessary or useful to Roche in connection with its regulatory filings for all Products in the Field in the Roche Territory, including, but not limited to clinical trial dossiers, regulatory correspondence, Regulatory Authority meeting minutes and study reports from completed non-clinical and clinical studies, and (v) comprehensive electronic Clinical Study, Post-Approval Commitment Study and Phase IV Study data relevant to the Product in the Field in an appropriate format. For all completed study reports so transferred to Roche, Atea shall provide necessary documentation to confirm data reliability, including, but not limited to original author signatures, raw data lists, GLP and GCP compliance information. All documentation is to be provided in English. Atea shall assist Roche in conducting any required GMP audit related to the above-mentioned documentation. Roche shall have the right to use all data and documents provided to Roche under this paragraph in its own filings and interactions with Regulatory Authorities for the Product in the Field in the Roche Territory, and for Unilateral Studies conducted by Roche in the Atea Territory, also in the Atea Territory.

From time to time as agreed by the JSC, Roche shall transfer to Atea (i) copies of all relevant historical clinical data for the Product in Roche's possession or control, (ii) copies of all material correspondence with the Regulatory Authorities for the Product in the Field in the Roche Territory, (iii) copies of regulatory dossiers containing information necessary or useful to Atea in connection with its regulatory filings for all Products, including, but not limited to clinical trial dossiers, regulatory correspondence, Regulatory Authority meeting minutes and study reports from completed non-clinical and clinical studies, and (iv) comprehensive electronic Clinical Study, Post-Approval Commitment Study and Phase IV Study data relevant to the Products in an appropriate format. For all completed study reports so transferred to Atea, Roche shall provide necessary documentation to confirm data reliability, including, but not limited to original author signatures, raw data lists, GLP and GCP compliance information. Roche shall assist Atea in conducting any required GMP audit related to the above-mentioned documentation. Atea shall have the right to use all data and documents provided to Atea under this paragraph in its own filings and interactions with Regulatory Authorities for the Product in the Field in the Atea Territory, and for Unilateral Studies, Clinical Studies for the Retained Indications, and Atea Ongoing Studies until hand-over of responsibility to Roche, in each case conducted by Atea in the Roche Territory, also in the Roche Territory.

In the event a Party cannot conduct regulatory activities independent of the other Party which would be needed to pursue Regulatory Approval of Products in the Roche Territory (for Roche) or the Atea Territory (for Atea), the other Party shall use Commercially Reasonable Efforts to assist the first Party and/or conduct any such regulatory activities on the first Party's behalf at the first Party's cost and expense.

Atea shall have, and Roche hereby grants to Atea, a right of reference and access to the regulatory filings for Product made by Roche in the Roche Territory, for the purpose of making regulatory filings in the Atea Territory for Product. Roche shall have, and Atea hereby grants to Roche, a right of reference and access to the regulatory filings for Product made by Atea in the Atea Territory, for the purpose of making regulatory filings in the Roche Territory for Product.

Notwithstanding the foregoing, Atea shall have the right and the responsibility for all regulatory affairs related to Products in the Territory for the Retained Indications, including the preparation and filing of applications for Regulatory Approval in the Retained Indications in the Territory.

7.2 Pharmacovigilance Agreement

The Parties shall execute a separate pharmacovigilance agreement as deemed applicable as soon as practicable after the Effective Date, but no later than the Initiation of the first Phase III Study in the Roche Territory or the first Regulatory Approval in the Roche Territory after the Effective Date (whichever comes first). Such pharmacovigilance agreement shall set forth the responsibilities and obligations of the Parties with respect to the procedures and timeframes for compliance with the applicable laws and regulations pertaining to safety reporting of the Product(s) and their related activities.

8. Manufacture and Supply

8.1 Clinical Supply of Product and Technology Transfer

8.1.1 [***] Manufacture and Supply by Atea

Atea shall have the responsibility for supplying API for technical development, as well as for clinical supply of the Products for the Field in the Territory for [***], and [***] of such supply by Atea, other than for the Atea Ongoing Studies and any Unilateral Study conducted by Atea, shall be [***]. Notwithstanding the foregoing, Roche will have the right to take over any part of the manufacture and supply of the Product for the Field in the Roche Territory at any time during [***]. The Parties will meet during [***] to discuss and decide on a hand-over plan of supply responsibilities in order to ensure a seamless continuation of manufacturing and supply beyond [***].

8.1.2 Manufacture and Supply after [***]

[***], after [***], Atea will remain responsible, at its own expense, for the manufacture and supply of clinical supplies of the Products for any Unilateral Study conducted by Atea and any Atea Ongoing Studies, and Roche shall be responsible at its own expense for the manufacture and supply of clinical supplies of the Products for sites included in the Clinical Studies conducted pursuant to the Global Development Plan other than any Atea Ongoing Studies, and for all sites for any Unilateral Study conducted by Roche. Notwithstanding the foregoing, the Parties will use Commercially Reasonable Efforts to ensure that the clinical supply of Products for use in the Field is obtained in a manner that is cost efficient and practical, which may include utilizing the other Party or the other Party’s CMO or other Third Manufacturer, as applicable.

8.1.3 First Generation Process Technology Transfer

Atea shall initiate within [***] days of the Effective Date a technology transfer to Roche in accordance with the plan set forth in Appendix 8.1.3 (as may be revised by mutual consent of the Parties) to enable Roche (or Roche’s designee(s)) to manufacture Compounds and Products using the First Generation Process.

8.1.4 Second Generation Process Technology Transfer

In addition, within [***] days after completion of the Early Second Generation Process Development for the Second Generation Process, Atea shall initiate substantially the same

technology transfer to Roche with respect to the Second Generation Process to enable Roche (or Roche's designee(s)) to conduct the Later Process Development for the Second Generation Process in accordance with a mutually agreed technology transfer plan. Atea shall inform Roche regularly at the JMC about its development efforts regarding the Second Generation Process, including about Atea's interactions with Third Parties that are involved in such development efforts. In addition, and upon Roche's request, Atea shall provide Roche with all information and documents regarding such development efforts. In case the JSC decides to use the Second Generation Process for commercial supply, Atea shall complete within [***] days substantially the same technology transfer to Roche as for the First Generation Process with respect to the Second Generation Process to enable Roche (or Roche's designee(s)) to conduct the Later Process Development for the Second Generation Process in accordance with a mutually agreed technology transfer plan.

8.1.5 Costs and Expenses of Technology Transfer

[***].

8.2 Commercial Supply of Products

Roche shall be responsible for the manufacture of commercial supplies of the Product for use in the Field in the Territory. Atea shall order all commercial supplies of the Product for use in the Field for the Atea Territory from Roche. Unless otherwise agreed by the Parties, within [***] days after the Effective Date, the Parties will negotiate in good faith and enter into a written supply agreement for the commercial supply of Products for use in the Field by Roche to Atea, with a related quality agreement providing for commercial supply of Product for use in the Field by Roche to Atea as the primary supplier and on the terms set forth in Appendix 8.2 hereto and other reasonable and customary terms (the "**Supply Agreement**").

Promptly after the Effective Date, each Party will prepare an initial good faith [***] rolling forecast of its demand, split into [***] buckets, in the Atea Territory or the Roche Territory (as applicable) for the Product for commercialization purposes in the Field (each a "**Demand Forecast Plan**"). The Parties shall discuss and align the Demand Forecast Plans for consolidation to be presented and approved at the JSC.

In the event of a Roche Inability to Supply, following discussion between the Parties, solely during the pendency of such Roche Inability to Supply (unless otherwise agreed by the Parties, such agreement not to be unreasonably withheld), Atea may engage its own CMO(s) for commercial supply of the Product for use in the Field for the Atea Territory to the extent in accordance with the Demand Forecast Plan and according to Roche's Safety, Security, Health and Environmental Protection (SHE) and GMP standards.

8.3 Manufacturing Process Development and Specifications

8.3.1 Early Second Generation Process Development

Atea shall have the responsibility at its own expense for the development of the Second Generation Process until the manufacture of a batch of at least [***] of Drug Substance is achieved, consisting of [***], using the Second Generation Process and meeting the applicable Specifications (the "**Early Second Generation Process Development**"). Roche will cooperate with and provide reasonable consultative and in-kind support of such Early Second Generation Process Development at its own expense.

8.3.2 First Generation Process Development, Later Second Generation Process Development and Commercial Scale-Up

Subject to Atea's technology transfer obligations pursuant to Section 8.1.3, Roche shall have the responsibility [***] for (a) any further development and scale-up of the First Generation Process ("**First Generation Process Development**"), (b) the development and scale-up of the Second Generation Process after the Early Second Generation Process Development (the "**Later Second Generation Process Development**"), and (c) scale-up of global commercial manufacturing of Drug Product ("**Commercial Scale-Up**"). Atea will cooperate with and provide reasonable consultative and in-kind support of such First Generation Process Development, Later Second Generation Process Development and Commercial Scale-Up [***].

8.3.3 Specifications

The Parties will mutually agree in good faith on the manufacturing and release specifications, including without limitation testing methods and acceptance criteria, for Drug Substance and Drug Product, for each of the First Generation Process and the Second Generation Process (for the Second Generation Process as further specified in Appendix 8.3.3), in each case as updated by the JSC from time to time (the **"Specifications**"). Each Party shall be solely responsible for establishing the specifications for packaging and labeling of finished Drug Product in its Respective Territory.

8.3.4 Decision Making

The Parties will collaborate and strive for consensus decision making on matters relating to First Generation Process Development, Early Second Generation Process Development, Later Second Generation Process Development, Commercial Scale-Up, Specifications and the choice of whether to use the First Generation Process or Second Generation Process for commercial manufacturing of Drug Substance, through the JMC. If the Parties are unable to agree on any such matters, the matter will be escalated to the JSC.

8.4 Supply for Retained Indications

Notwithstanding anything to the contrary in this Article 8, Atea shall have the sole right and responsibility for the supply of Compound and Product in the Territory for the Retained Indications at its own cost, unless the Parties otherwise agree in writing.

9. Commercialization

9.1 Responsibility

Roche, at its own expense, shall have the sole responsibility and decision-making authority for the marketing, promotion, sale and distribution of Products in the Field in the Roche Territory.

Atea, at its own expense, shall have the sole responsibility and decision-making authority for the marketing, promotion, sale and distribution of Products in the Atea Territory (subject to Section 2.3 and any Co-Promotion Agreement).

The JOC will review the Parties' commercialization plans for their Respective Territories for Product for use in the Field, to monitor brand messaging and to make recommendations for consistency and optimization of such messaging. Atea shall in good faith consider reasonable comments from Roche relating to commercialization plans for the Product in the Field in the Atea Territory, made through the JOC or JSC.

9.2 Pricing

The Parties will consider in good faith any global guidelines and strategy for pricing agreed to by the JSC (which shall be non-binding) in establishing pricing of Products. Notwithstanding any provision to the contrary set forth in this Agreement, all decisions for each Product related to any

pricing matter, including list price, targeted net pricing, sales-weighted average discounts and rebates, pricing strategy (including the approach to pricing with different types of accounts and plans, including types of discounts and rebates), any non-U.S. equivalents of all of the foregoing, and modifications to any of the foregoing, will be solely made by (a) Roche for the Roche Territory and (b) Atea for the Atea Territory.

9.3 Diligence

Roche shall use Commercially Reasonable Efforts to pursue further development and commercialization of Products in the Field in the Roche Territory (other than for the Retained Indications, unless and until the Parties enter into an amendment pursuant to Section 2.1.4). Atea shall use Commercially Reasonable Efforts to pursue further development (and commercialization, in case Atea exercises its Co-Promotion Option) of Products in the Field in the Atea Territory (other than for the Retained Indications). Roche shall be deemed to use Commercially Reasonable Efforts if Roche develops and commercializes at least one Product in at least one Indication. Roche (and its Affiliates) shall not be obliged to seek to market such Product in every country or seek to obtain Regulatory Approval in every country of the Roche Territory. As a result, the exercise of diligence by Roche is to be determined by judging Roche's Commercially Reasonable Efforts in the Roche Territory, taken as a whole.

10. Payment

10.1 Initiation Payment

Within [***] days after the Effective Date and receipt of an invoice from Atea, Roche shall pay to Atea three hundred and fifty million US Dollars (US$ 350,000,000).

10.2 Development and Regulatory Event Payments

Roche shall pay up to a total of three hundred and thirty million US Dollars (US$ 330,000,000) in relation to the achievement of development and regulatory events with respect to Products. The development and regulatory event payments under this Section 10.2 shall be paid by Roche according to the following schedule of development and regulatory events:

Development and Regulatory Event	US Dollars (in millions)
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
Total potential development and regulatory event payments:	**330**

Each development and regulatory event payment shall be paid only once, the first time that any Product reaches the applicable triggering event and receipt of an invoice, regardless of the number of times such events are reached and by how many Products, subject to Section 10.5.

Upon reaching development and regulatory events (or in the case of manufacture by Atea of a Qualifying Second Generation Batch, receipt of notice by Roche from Atea that Atea has reached such development and regulatory event and confirmation by Roche of the same), Roche shall notify Atea within [***] days of the achievement of each milestone event described in this Section 10.2 and shall be paid by Roche to Atea within [***] days after receipt of an invoice from Atea.

10.3 Sales Based Events

Roche shall pay to Atea up to a total of three hundred and twenty million US Dollars (US$ 320,000,000) based on Calendar Year Net Sales of a Product in the Roche Royalty Territory:

Sales-Based Event	US Dollars (in millions)
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
Total potential sales-based event payments:	**320**

Each of the sales-based event payments shall be paid no more than once [***] days after the end of the Calendar Quarter in which the event first occurs for the Product in the Roche Royalty Territory first reaching the respective Calendar Year Net Sales threshold and receipt of an invoice from Atea, and shall be non-refundable

10.4 Royalty Payments.

10.4.1 Royalty Term

On a Product-by-Product and country-by-country basis, Roche shall pay to Atea royalties on Net Sales of Products in such country in the Roche Royalty Territory during the relevant Royalty Term. Thereafter, the licenses granted to Roche for a given Product in such country shall be fully paid up, irrevocable and royalty-free.

10.4.2 Royalty Rates

The following royalty rates shall apply to the respective tiers of aggregate Calendar Year Net Sales of a Product in the Roche Royalty Territory, on an incremental basis, as follows:

Tier of Calendar Year Net Sales in million US$	Percent (%) of Net Sales
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**

For example, if Net Sales of a Product in the Roche Royalty Territory for a given Calendar Year are US$ [***] million, and such Product is a Patent Product, then royalties owed to Atea on such Net Sales of such Product for that Calendar Year shall equal US$ [***] calculated as follows:

[***]

For the purpose of calculating royalties for a Product, Calendar Year Net Sales and the royalty rates shall be subject to the following adjustments, as applicable:

10.4.3 Combination Product

If Roche or its Affiliates intend to sell a Combination Product, then the Parties shall meet approximately [***] prior to the anticipated First Commercial Sale of such Combination Product in the Territory to negotiate in good faith and agree to an appropriate adjustment to Net Sales to reflect the relative commercial value contributed by the components of the Combination Product (the "**Relative Commercial Value**"). If, after such good faith negotiations not to exceed [***] days, the Parties cannot agree to an appropriate adjustment, the dispute shall be initially referred to the executive officers of the Parties in accordance with Section 21.2.

If the Parties are unable to agree on the Relative Commercial Value within [***] days of such referral, then the Relative Commercial Value shall be determined by the following procedure. Roche will select [***], Atea will select [***], and those [***] individuals shall select [***] and who shall be chairman of a committee of the [***] Experts (the "**Expert Committee**"), each with a single deciding vote. The Expert Committee will promptly hold a meeting to review the issue under review, at which it will consider memoranda submitted by each Party at least [***] days before the meeting, as well as reasonable presentations that each Party may present at the meeting. The determination of the Expert Committee as to the issue under review will be binding on both Parties. The Parties will share equally in the costs of the Expert Committee. Unless otherwise agreed to by the Parties, the Expert Committee may not decide on issues outside the scope mandated under terms of this Agreement.

10.4.4 No Valid Claim; Generic Competition

For a given Product, if in a given country within the Territory there is:

(a) no Composition of Matter Claim that Covers such Product remains in such country (i.e., such Product is not a Patent Product in such country); or

(b) entry of a Generic Product has occurred;

then the royalty payments due to Atea for such Product in such country shall be reduced by [***]. If both a) and b) have occurred, then the Royalty Term for such Product in such country shall end (unless the Royalty Term had expired prior to such time for a given Product in a given country), royalties shall no more be due by Roche in such country for such Product, and the license in that country for such Product shall be fully paid-up and irrevocable.

10.4.5 Apportionment of Compulsory Sublicensee Consideration

Compulsory Sublicense Compensation received by the Roche Group from a Compulsory Sublicensee during the Royalty Term for a Product in a country shall be shared with Atea on an equivalent profit share percentage (the "**Compulsory Profit Share Percentage**") calculated for the respective Calendar Year as follows:

[***]

At the end of the Calendar Year, Roche shall pay to Atea the [***]. For clarity, any sales or payments by Compulsory Sublicensees under a Compulsory Sublicense shall not be considered as Net Sales and shall not give rise to any royalty payment under Section 10.4.2 of this Agreement.

10.5 Payments for Products containing [***]

In case the JSC decides to pursue development or commercialization of a Product that contains a [***], then at the time such decision is made, the Parties shall discuss in good faith any reasonable adjustments that may be appropriate to make to the payments from Roche to Atea based on Sections 10.2, 10.3, and 10.4, prior to commencement of any such activities, subject to the following sentence. [***].

10.6 Third Party Payments

[***] shall be responsible for and pay or have paid the entire consideration owed to any Third Party in relation to [***]. To the extent [***] fails to make any [***] when due, [***] may make such payment to the applicable Third Party [***]. In such event, or if [***] as provided in [***] or enters into a [***] as provided in [***] and makes [***] thereunder, [***] may request [***] as provided in [***] or [***] of such [***] under this Agreement.

The responsibility for payment of consideration owed to any Third Party in relation to [***] shall be [***]. The Party making [***] shall be [***] (or, in the case of [***]).

In the event that both [***] and [***] are made under the same agreement with the same Third Party and cannot be clearly distinguished from each other, then the Parties will discuss in good faith and agree on which part of such payments is attributable to [***] or [***]. If, after such good faith negotiations not to exceed [***] days, the Parties cannot agree to an appropriate allocation, the dispute shall be initially referred to the executive officers of the Parties in accordance with Section 21.2. If the Parties are unable to agree on the allocation within [***] days of such referral, then such allocation shall be determined by the procedure described in the second paragraph of Section 10.4.3.

10.7 Disclosure of Payments

Each Party acknowledges that the other Party may be obligated to disclose this financial arrangement, including all fees, payments and transfers of value, as may be advisable or required under Applicable Law, including the US Sunshine Act.

11. Accounting and reporting

11.1 Timing of Royalty Payments

Roche shall calculate royalties on Net Sales quarterly as of March 31, June 30, September 30 and December 31 (each being the last day of an "**Accounting Period**") and shall share with Atea within [***] days after the end of each Accounting Period in which Net Sales occur a good faith estimate of the royalties payable to Atea for such Accounting Period. Within [***] days after the end of each Accounting Period, Roche shall pay the royalties on Net Sales to Atea in line with the finally reported Net Sales for each Calendar Quarter as set forth in Section 11.6, which finally reported Net Sales (i) Roche shall report to Atea during such time period, (ii) may deviate from the good faith estimate provided earlier, and (iii) shall be relevant for the purposes of calculating the royalty owed under Section 10.4.

11.2 Late Payment

Any payment under this Agreement that is not paid on or before the date such payment is due shall bear interest, to the extent permitted by Applicable Law, at [***] percentage points above the [***], as reported by Reuters from time to time, calculated on the number of days such payment is overdue.

11.3 Method of Payment

Royalties on Net Sales shall be paid by Roche in US Dollars (the "**Payment Currency**") to account(s) designated by Atea. All other amounts payable by a Party to the other Party hereunder shall be paid in the Payment Currency to account(s) designated by the other Party.

11.4 Currency Conversion

When calculating the Sales of any Product that occur in currencies other than the Payment Currency, Roche shall convert the amount of such sales into Swiss Francs and then into the Payment Currency using Roche's then-current internal foreign currency translation method actually used on a consistent basis in preparing its audited financial statements (at the Effective Date, YTD average rate as reported by Reuters).

11.5 Blocked Currency

In a given country, if by reason of Applicable Law (for example governmental restrictions on foreign exchange trade) the local currency is blocked and cannot be removed from such country, Roche will notify Atea in writing and

(a) Atea will have the right to receive the applicable royalties of Net Sales in such country in local currency by deposit in a local bank designated by Atea, or

(b) if such local currency payment is not allowed by reason of Applicable Law or if otherwise requested by Atea, then the royalties related to such Net Sales in such country shall continue to be accrued and shall continue to be reported, but such royalties will not be paid until the sales proceeds related to such Net Sales may be removed from such country. At such time as Roche, its Affiliates or their Sublicensees, as the case may be, is able to remove the sales proceeds related to such Net Sales from such country, Roche shall also pay such accrued royalties in Payment Currency using the actual exchange rate which is used to remove such sales proceeds from such country.

11.6 Royalty Reporting

With each royalty payment Roche shall provide Atea in writing for the relevant Calendar Quarter on a Product-by-Product basis the following information:

(a) Sales in Swiss Francs;

(b) Net Sales in Swiss Francs;

(c) adjustments made pursuant to Section 10.4.3, adjustments made pursuant to Sections 10.4.4 or 10.5; and

(d) total royalty payable in the Payment Currency after adjustments made pursuant to Sections 10.4.4 or 10.5 and the conversion rate used to calculate the same.

11.7 Reimbursement

For reimbursement of Out of Pocket Expenses and FTE Costs incurred by or on behalf of either Party or any of its Affiliates in connection with its activities under [***], as soon as practicable after the end of each Calendar Quarter, but in any event no later than [***] days after the end of each such Calendar Quarter, each Party shall share with the other Party a good faith estimate of such reimbursable costs incurred by such Party. In no event later than [***] days after the end of such Calendar Quarter each Party shall update the good faith estimate to reflect changes in the Out of Pocket Expenses and FTE Costs (each, a **"Reconciliation Interim Report"**), together with reasonable supporting documentation for such costs. Each Party shall have [***] days after the delivery of the other Party's Reconciliation Interim Report to review and ask questions.

Within [***] days following the end of such Calendar Quarter, each Party shall update its Reconciliation Interim Report to reflect the final amounts and the Parties shall coordinate to aggregate the reports to calculate the total amount to be reimbursed under this Agreement (**"Reconciliation Final Report"**). The Party that owes payment to the other Party pursuant to the Reconciliation Final Report shall pay such amount (to the extent not subject to a good faith dispute) within [***] days after receipt of an invoice from the Party that is due payment.

For all amounts for which a Party (the "**Owing Party**") is obligated to reimburse or pay the other Party (the "**Owed Party**") pursuant to this Agreement for which no specific provision is provided hereunder regarding how such payment shall be made, the Owed Party shall send to the Owing Party an invoice for such amount within [***] days after the Owed Party's determination that such amount is payable by the Owing Party, which invoice shall include a reference to the section of

this Agreement under which the Owed Party is requesting reimbursement or payment and be accompanied by reasonable documentation of the incurrence or accrual of the costs to be reimbursed. Payment with respect to each such invoice shall be due within [***] days after receipt by the Owing Party thereof.

12. Taxes

12.1 Indirect Taxes

All payments provided for in this Agreement are exclusive of Indirect Taxes. If any Indirect Taxes are chargeable in respect of any such payments, the paying Party shall pay such Indirect Taxes at the applicable rate in respect of any such payments following the receipt, where applicable, of an Indirect Taxes invoice issued by the payee Party in respect of those payments. The Parties shall cooperate in good faith to minimize Indirect Taxes addressed in this Section 12.1 in accordance with Applicable Law.

12.2 Tax Withholding

Each Party shall be entitled to deduct and withhold from any amounts payable under this Agreement such taxes as are required to be deducted or withheld therefrom under any provision of Applicable Law; provided, however, that [***]. The Party that is required by Applicable Law to make such deduction or withholding shall deduct such amounts from such payment, promptly pay such amount on behalf of the other Party to the proper governmental authority, and promptly furnish the other Party with proof of payment on a timely basis following such payment. [***].

12.3 Assistance

Each Party agrees to reasonably assist the other Party in claiming refunds or exemption from such deductions or withholdings under double taxation or similar agreement or treaty from time to time in force and in minimizing the amount required to be so withheld or deducted.

12.4 Tax Documentation

Each Party receiving payments under this Agreement shall provide to the other Party, at the time or times reasonably requested by such other Party or as required by Applicable Law, such properly completed and duly executed documentation (for example, IRS Form W-9 or applicable Form W-8) as will permit payments made under this Agreement to be made without, or at a reduced rate of, withholding for taxes.

12.5 Tax Information

[***]

13. Auditing

13.1 Atea Right to Audit

Roche shall keep, and shall require its Affiliates and Sublicensees to keep, full, true and accurate books of account containing all particulars that may be necessary for the purpose of calculating all royalties payable under this Agreement. Such books of accounts shall be kept at their principal place of business. Atea shall, at its own expense, have the right to engage an internationally recognized independent public accountant reasonably acceptable to Roche to perform, on behalf of Atea, an audit of such books and records of Roche and its Affiliates that are deemed necessary by the independent public accountant to report on Net Sales of Product for the period or periods requested by Atea and the correctness of any financial report or payments made under this Agreement.

13.1.1 Upon timely request and at least [***] working days' prior written notice from Atea, such audit shall be conducted for those countries Atea has specifically requested, during regular business hours in such a manner as to not unnecessarily interfere with Roche's normal business activities. Such audit shall be limited to results in the [***] Calendar Years prior to audit notification, and if Atea requests an audit for a given Calendar Year, no additional audits may be conducted in the Territory for such Calendar Year. If Atea does not request an audit of a given Calendar Year on or before the [***] anniversary of the end of such Calendar Year, then Atea will be deemed to have accepted the royalty payments and reports in such Calendar Year.

13.1.2 Such audit shall not be performed more frequently than [***] per Calendar Year nor more frequently than once with respect to records covering any specific period of time.

13.1.3 All information, data documents and abstracts herein referred to shall be used only for the purpose of verifying royalty statements, shall be treated as Roche's Confidential Information subject to the obligations of this Agreement and need neither be retained more than [***] year after completion of an audit hereof, if an audit has been requested; nor more than [***] years from the end of the Calendar Year to which each shall pertain; nor more than [***] years after the date of termination of this Agreement.

13.2 Audit Reports

The auditors shall only state factual findings in the audit reports and shall not interpret the agreement. The auditors shall share all draft audit findings with Roche before sharing such findings with Atea and before the final audit report is issued. The final audit report shall be shared with Roche at the same time it is shared with Atea.

13.3 Over-or Underpayment

If the audit reveals an overpayment, Atea shall reimburse Roche for the amount of the overpayment within [***] days. If the audit reveals an underpayment, Roche shall make up such underpayment with the next royalty payment or, if no further royalty payments are owed by Roche, Roche shall reimburse Atea for the amount of the underpayment within [***] days. Roche shall pay for the audit costs if the underpayment of Roche exceeds [***] of the aggregate amount of royalty payments owed with regard to the royalty statements subject to the audit. Section 11.2 shall apply to this Section 13.3.

14. Intellectual Property

14.1 Ownership of Inventions and Collaboration Know-How

Atea shall own all Atea Inventions, Roche shall own all Roche Inventions, and Atea and Roche shall jointly own all Joint Inventions. Atea and Roche each shall require all of its employees to assign all inventions related to Products made by them to Roche and Atea, as the case may be.

The determination of inventorship for Inventions shall be in accordance with US inventorship laws as if such Inventions were made in the US.

Subject to the licenses granted under this Agreement, Atea and Roche will each have an equal undivided share in the Joint Patent Rights, without obligation to account to the other for exploitation thereof, or to seek consent of the other Party for the grant of any license thereunder. Each Party hereby waives any right it may have under the laws of any jurisdiction to require such approval, consent or accounting with respect to jointly owned Inventions and Joint Patent Rights. Each Party hereby grants to the other party a nonexclusive, royalty-free (except as provided in this Agreement), worldwide license, with the right to grant sublicenses through multiple tiers (except as otherwise expressly provided in this Agreement) under their undivided interest in jointly owned Inventions and Joint Patent Rights to exploit jointly owned Inventions.

Except as specifically set forth herein, this Agreement shall not be construed as (i) giving any of the Parties any license, right, title, interest in or ownership to the Confidential Information; (ii) granting any license or right under any intellectual property rights; or (iii) representing any commitment by either Party to enter into any additional agreement, by implication or otherwise.

With respect to Know-How (other than Inventions) generated pursuant to the Global Development Plan, Atea shall own such Know-How made by employees of Atea solely or jointly with a Third Party, Roche shall own such Know-How made by employees of the Roche Group solely or jointly with a Third Party, and the Parties shall jointly own such Joint Know-How**.**

14.2 German Statute on Employee Inventions

In accordance with the German Statute on Employees Inventions, each Party agrees to claim the unlimited use of any Invention conceived, reduced to practice, developed, made or created in the performance of, or as a result of, any activities conducted under the Agreement by employees of any German Affiliates. For the avoidance of doubt, each Party is responsible for fulfilling the obligations towards their employees under the German Statute of Employee's Inventions.

14.3 Trademarks

[***] shall have the right to obtain the International Non-proprietary Name (INN) from the World Health Organization and the US Adopted Name (USAN) from the US adopted Names Council (USANC) as the generic name(s) for the Products other than [***].

Atea shall own all trademarks used on or in connection with Products in the Atea Territory, and shall, at its sole cost, be responsible for procurement, maintenance, enforcement and defense of all trademarks used on or in connection with Products in the Atea Territory.

Roche shall own all trademarks used on or in connection with Products in the Roche Territory, and shall, at its sole cost, be responsible for procurement, maintenance, enforcement and defense of all trademarks used on or in connection with Products in the Roche Territory.

The Parties shall attempt to use a global trademark and logo for the Product; provided, that each Party may use such trademark as it selects to promote the sale of the Product in its Respective Territory (the "**Product Trademarks**"). Each Party shall grant the other Party a non-exclusive, royalty-free license to use the Product Trademarks it selects and owns solely for the purposes of manufacturing, distributing, promoting, selling and offering for sale the Product as permitted by this Agreement. Such trademark licenses shall be non-transferable, except that Atea shall have the right to sublicense such rights to its licensees in the Atea Territory, and Roche shall have the right to sublicense such rights to its permitted Sublicensees in the Roche Territory.

The Party owning each Product Trademark shall maintain all registrations of such Product Trademarks and the other Party shall not file any registrations or other filings in respect of any of such Product Trademarks without the owner's prior written consent.

Each Party shall use the Product Trademarks in accordance with sound trademark and trade name usage principles and in accordance with all Applicable Law as reasonably necessary to maintain the validity and enforceability of the Product Trademarks. Each Party recognizes that the Product Trademarks owned by the other Party represent a valuable asset of such other Party, and that substantial recognition and goodwill are associated with such name, logo and trademarks. Each Party hereby agrees that, except as expressly stated in this Agreement or otherwise agreed in writing by the other Party, it shall not use such other Party's Product Trademarks for any purpose.

14.4 Prosecution of Atea Patent Rights

Atea shall, at its own expense (and with regard to (i) at its own discretion), (i) Handle all Atea Patent Rights, (ii) consult with Roche as to the Handling of such Atea Patent Rights, and (iii) furnish to Roche copies of all documents relevant to any such Handling. Atea shall furnish such documents and consult with Roche [***] before any action by Atea is due to allow Roche to provide comments thereon, [***]. At Atea's expense and reasonable request, Roche shall cooperate, in all reasonable ways with the Handling of all Atea Patent Rights.

14.5 Abandonment of Atea Patent Rights

If Atea determines to abandon any Atea Patent Right that is licensed to Roche under this Agreement then, prior to such abandonment, Atea shall offer such Patent Right to Roche to Handle thereafter at its own cost and expense, subject to the following: Roche shall (i) consult with Atea, through the patent coordination team as to the Handling thereof, and (ii) furnish to Atea copies of all documents relevant to any such Handling.

14.6 Prosecution of Roche Patent Rights Claiming Roche Inventions

Roche shall, at its own expense (and with regard to (i) at its own discretion), (i) Handle all Roche Patent Rights claiming Roche Inventions, (ii) consult with Atea as to the Handling of such Roche Patent Rights, and (iii) furnish to Atea copies of all documents relevant to any such Handling. Roche shall furnish such documents and consult with Atea [***] before any action by Roche is due with respect to such Roche Patent Rights to allow Atea to provide comments thereon, [***]. At Roche's expense and reasonable request, Atea shall cooperate, in all reasonable ways with the Handling of all such Roche Patent Rights.

14.7 Abandonment of Roche Patent Rights Claiming Roche Inventions

If Roche determines to abandon any Roche Patent Right Covering Roche Inventions then, prior to such abandonment, Roche shall offer such Patent Right to Atea to Handle thereafter at its own cost and expense, subject to the following: Atea shall (i) consult with Roche, through the patent coordination team as to the Handling thereof, and (ii) furnish to Roche copies of all documents relevant to any such Handling.

14.8 Prosecution of Joint Patent Rights

Atea shall, at its own expense (and with regard to (i) at its own discretion), (i) Handle all Joint Patent Rights that claim the Compound or Product, or the composition or formulation, methods-of-treatment, or therapeutic uses of the Compound or Product (except such Joint Patent Rights that claim manufacturing processes, intermediates, and IV formulations resulting from any IV Lead Compound Formulation activities), (ii) consult with Roche as to the Handling of such Joint Patent Rights, and (iii) furnish to Roche copies of all documents relevant to any such Handling. Atea shall furnish such documents and consult with Roche [***] before any action by Atea is due to allow Roche to provide comments thereon, [***]. At Atea's expense and reasonable request, Roche shall cooperate, in all reasonable ways with the Handling of all such Joint Patent Rights.

Roche shall, at its own expense and discretion, (i) Handle all Joint Patent Rights that are not Handled by Atea, (ii) consult with Atea as to the Handling of such Joint Patent Rights, and (iii) furnish to Atea copies of all documents relevant to any such Handling. Roche shall furnish such documents and consult with Atea [***] before any action by Roche is due to allow Atea to provide comments thereon, [***]. At Roche's expense and reasonable request, Atea shall cooperate, in all reasonable ways with the Handling of all such Joint Patent Rights.

14.9 Abandonment of Joint Patent Rights

If the Party Handling Joint Patent Rights pursuant to Section 14.8 determines to abandon any Joint Patent Right then, prior to such abandonment, such Party shall offer such Joint Patent Right to the other Party to Handle thereafter at its own cost and expense, subject to the following: the other Party shall (i) consult with the abandoning Party, through the patent coordination team as to the Handling thereof, and (ii) furnish to the abandoning Party copies of all documents relevant to any such Handling.

14.10 Patent Coordination Team

Where the Parties need to consult with each other on the Handling of Patent Rights, the Parties shall establish a patent coordination team and shall adopt procedures for interacting on patent matters.

14.11 [***]

14.12 CREATE Act

It is the intention of the Parties that this Agreement is a "joint research agreement" as that phrase is defined in 35 USC § 102(c) (AIA). In the event that either Party to this Agreement intends to overcome a rejection of a claimed invention covered by Joint Patent Rights or the Atea Patent Rights pursuant to the provisions of 35 USC §§ 102(a)-(d), such Party shall first obtain the prior written consent of the other Party. Following receipt of such written consent, such Party shall limit any amendment to the specification or statement to the patent office with respect to this Agreement to that which is strictly required by the applicable subsection of 35 USC § 102 and the rules and regulations promulgated thereunder and which is consistent with the terms and conditions of this Agreement (including the scope of the Global Development Plan). To the extent that the Parties agree that, in order to overcome a rejection of a claimed invention covered by Joint Patent Rights or the Atea Patent Rights pursuant to the provisions of the applicable subsection of 35 USC § 102, if the filing of a terminal disclaimer is required or advisable, the Parties shall first agree on terms and conditions under which the patent application subject to such terminal disclaimer and the patent or application over which such application is disclaimed shall be jointly enforced, to the extent that the Parties have not previously agreed to such terms and conditions. In the event that Roche enters into an agreement with a Third Party with respect to the further research, development or commercialization of a Product, Atea shall, upon Roche's request, similarly enter into such agreement with such Third Party for the purposes of furthering the Parties' objectives under this Agreement, provided that such agreement does not place any material obligation on Atea.

14.13 Infringement

Each Party shall promptly provide written notice to the other Party during the Agreement Term of any (a) known infringement or suspected infringement by a Third Party of any Atea Patent Rights, Roche Patent Rights or Joint Patent Rights (an "**Infringement**"), or (b) known or suspected unauthorized use or misappropriation by a Third Party of any Atea Know-How, Roche Know-How or Joint Know-How (a "**Misappropriation**"), and shall provide the other Party with all evidence in its possession supporting such Infringement or Misappropriation.

Within [***] days after the Dominant Party provides or receives such written notice ("**Decision Period**"), the Dominant Party, in its sole discretion, shall decide whether or not to initiate a suit or action in the Territory regarding such infringement or unauthorized use or misappropriation and shall notify other Party of its decision in writing ("**Suit Notice**"). The "**Dominant Party**" shall be (i) Roche in the case of (A) a Misappropriation of Roche Know-How in the Atea Territory (a "**US Roche Know-How Misappropriation**" or (B) an Infringement or Misappropriation in the Roche Territory, and (ii) Atea in the case of an Infringement or Misappropriation of in the Atea Territory other than a US Roche Know-How Misappropriation.

If the Dominant Party decides to bring a suit or take action, once the Dominant Party provides Suit Notice, the Dominant Party may immediately commence such suit or take such action. In the event that the Dominant Party (i) does not in writing advise the other Party within the Decision Period that the Dominant Party will commence suit or take action, or (ii) fails to commence suit or take action within a reasonable time after providing Suit Notice, the other Party shall thereafter have the right to commence suit or take action and shall provide written notice to the Dominant Party of any such suit commenced or action taken by it.

Upon written request, the Party bringing suit or taking action ("**Initiating Party**") shall keep the other Party informed of the status of any such suit or action and shall provide the other Party with copies, to the extent the Initiating Party is lawfully permitted to do so, of all substantive documents or communications filed in such suit or action. The Initiating Party shall have the sole and exclusive right to select counsel for any such suit or action; provided that the other Party may engage counsel to monitor such suit or action at such other Party's expense.

The Initiating Party shall, except as provided below, pay all expenses of the suit or action, including the Initiating Party's attorneys' fees and court costs. Unless otherwise agreed by the Parties, and subject to the Parties' respective obligations under Article 16, all monies recovered upon the final judgment or settlement of any action described in this Section 14.13 shall be used as follows:

(a) First, to reimburse the Initiating Party for its costs associated with such action and, if any remains, to the other Party for any fees and costs incurred in connection with such action; and

(b) Second,

(i) [***]; and

(ii) [***].

If the Initiating Party believes it is reasonably necessary or desirable to obtain an effective remedy, upon written request the other Party agrees to be joined as a party to the suit or action but shall be under no obligation to participate except to the extent that such participation is required as the result of its being a named party to the suit or action. At the Initiating Party's written request, the other Party shall offer reasonable assistance to the Initiating Party in connection therewith at no charge to the Initiating Party except for reimbursement of reasonable out-of-pocket expenses incurred by the other Party in rendering such assistance. The other Party shall have the right to participate and be represented in any such suit or action by its own counsel at its own expense.

The Initiating Party may settle, consent judgment or otherwise voluntarily dispose of the suit or action ("**Settlement**") without the written consent of the other Party but only if such Settlement can be achieved without adversely affecting the other Party or its Affiliates (including their interest in and to the Product or to any of their Patent Rights). If a Settlement could adversely affect the other Party, then the written consent of the other Party would be required, which consent shall not be unreasonably withheld.

For any patent that is not an Atea Patent Right or a Joint Patent Right, Roche, in its sole discretion, shall decide whether or not to initiate such suit or action in the Territory. Roche shall have full discretion as to how it wishes to handle such suit and may reach Settlement and retain all damages, settlement fees or other consideration under any terms and conditions it desires and retain whatever proceeds are realized in such suit or action. Only if a Settlement could adversely affect Atea or its Affiliates (including their interest in and to the Product or to any of their Patent Rights) shall the written consent of Atea be required, which consent shall not be unreasonably withheld.

14.14 Defense

14.14.1 Notice

If a Third Party asserts that a Patent Right controlled by it is, or will be, infringed by the exploitation of the Product in the Territory in accordance with this Agreement, then the Party first obtaining knowledge of such claim will promptly provide the other with prompt written notice thereof and the related facts in reasonable detail.

14.14.2 Responsibility to Defend

During the Agreement Term, if a Third Party asserts that a Patent Right controlled by such Third Party is infringed, or will be infringed, by the exploitation of the Product, then the JSC will promptly discuss the matter and the appropriate course of action. If the JSC cannot agree on a course of action within [***] days following the date on which the JSC receives notice of such Third Party claim, then: (a) Atea will have the first right, but not the obligation, to defend such claim in the Atea Territory using counsel of its own choosing, and (b) Roche will have the first right, but not the obligation, to defend such claim in the Roche Territory using external counsel agreed by the Parties. If the Party having the first right does not take affirmative steps to defend such claim in the Respective Territory within [***] days (or such shorter period of time as is legally required to answer to such claim), then the other Party may defend such claim in such territory.

The Party defending such claim will (i) keep the other Party reasonably informed regarding any such assertion, including by providing the other Party with copies of all pleadings and other documents filed in any proceeding relating to such claim, (ii) consider reasonable input from the other Party during the course of the claim, and (iii) provide the other Party with the opportunity to attend any substantive meetings, hearings, or other proceedings related to such claim (together with its own counsel, at its own expense) and to review and comment on all substantive documents related to such claim prior to filing or submission of such documents. The Parties will reasonably assist each other and cooperate and share information with respect to any such claim. Each Party will bear its own costs and expenses with respect to any such claim.

14.14.3 Settlement

Each Party is free to pursue or enter into any settlement or license agreement with any Third Party with respect to the Patent Rights that are the subject of a claim brought by a Third Party that a Patent Right controlled by such Third Party is infringed by the exploitation of the Product in the Relevant Territory without the other Party's prior written consent provided such settlement or license agreement does not affect the other Party or its Affiliates (including their interest in and to the Product or to any of their Patent Rights). The Parties acknowledge and agree that [***].

14.15 Third Party Licenses

If in either Party's opinion a license to Third Party Patent Rights or other intellectual property rights is necessary or reasonably useful to develop, make, use or sell Products, then such Party may notify the other Party in writing of the Third Party and the applicable intellectual property rights, and the Parties will cooperate to negotiate and enter into a license or other agreement with the Third Party to obtain a license to such Third Party intellectual property rights (a "**Third Party IP License**"). [***] shall have the first right to negotiate and enter into a Third Party IP License with a Third Party to obtain [***] Third Party Rights, and [***] shall have the first right to negotiate and enter into a Third Party IP License to obtain [***] Third Party Rights (the Party having the first right to negotiate and enter into any such license or other agreement being the "**Primary Negotiating Party**"). The Primary Negotiating Party will have the right for a reasonable period following such

notice to negotiate the Third Party IP License or otherwise resolve the matter by, for example, challenging the relevant Third Party Patent Rights or conducting any oppositions, inter partes reviews or similar proceedings. If the Primary Negotiating Party is unable or unwilling to obtain such license within such reasonable period, then the other Party shall have the right to obtain such license from the Third Party or otherwise resolve the matter by, for example, challenging the relevant Third Party Patent Rights or conducting any oppositions, inter partes reviews or similar proceedings. Notwithstanding which Party negotiates and enters into a Third Party IP License pursuant to this Section 14.15, the Parties will mutually agree on the terms and conditions of any such Third Party IP License. If the Parties are unable to agree on the terms and conditions of any Third Party IP License, the matter will be escalated to the JSC.

14.16 Common Interest Disclosures

With regard to any information or opinions disclosed pursuant to this Agreement by one Party to each other regarding intellectual property or technology owned by Third Parties, the Parties agree that they have a common legal interest in determining whether, and to what extent, Third Party intellectual property rights may affect the conduct of the development or manufacturing activities under this Agreement or Compounds or Products, and have a further common legal interest in defending against any actual or prospective Third Party claims based on allegations of misuse or infringement of intellectual property rights relating to the conduct of the development or manufacturing activities under this Agreement or Compounds or Products. Accordingly, the Parties agree that all such information and materials obtained by Atea and Roche from each other will be used solely for purposes of the Parties' common legal interests with respect to the conduct of the Agreement. All information and materials will be treated as protected by the attorney-client privilege, the work product privilege, and any other privilege or immunity that may otherwise be applicable. By sharing any such information and materials, neither Party intends to waive or limit any privilege or immunity that may apply to the shared information and materials. Neither Party shall have the authority to waive any privilege or immunity on behalf of the other Party without such other Party's prior written consent, nor shall the waiver of privilege or immunity resulting from the conduct of one Party be deemed to apply against any other Party. Notwithstanding the foregoing, neither Party's attorney represents the other Party.

14.17 Hatch-Waxman

Notwithstanding anything herein to the contrary, should a Party receive a certification for a Product pursuant to the Drug Price Competition and Patent Term Restoration Act of 1984 (Public Law 98-417, known as the Hatch-Waxman Act), as amended, or its equivalent in a country other than the US, then such Party shall immediately provide the other Party with a copy of such certification.

Atea shall have the sole right to bring suit, at its expense, within a [***] day period from the date of any such certification in the Atea Territory.

Roche shall have the sole right to bring suit, at its expense, within the applicable, country-specific maximum period of time from the date of any such certification in the Roche Territory.

14.18 Patent Term Extensions

Atea shall use Commercially Reasonable Efforts to obtain all available patent term extensions, adjustments or restorations, or supplementary protection certificates ("**SPCs**", and together with patent term extensions, adjustments and restorations, "**Patent Term Extensions**") for Atea Patent Rights or Joint Patent Rights with respect to the Product that Atea Handles pursuant to Section 14.8. All filings for such Patent Term Extensions shall be made by Atea (unless the Parties otherwise agree in writing); provided, that in the event that Atea elects not to file for a Patent Term Extension, Atea shall (a) promptly inform Roche of its intention not to file and (b) grant Roche the right to file for such Patent Term Extension.

Roche shall use Commercially Reasonable Efforts to obtain all available SPCs and Patent Term Extensions for Roche Patent Rights or Joint Patent Rights with respect to the Product that Roche Handles pursuant to Section 14.8. All filings for such Patent Term Extensions shall be made by Roche (unless the Parties otherwise agree in writing); provided, that in the event that Roche elects not to file for a Patent Term Extension, Roche shall (a) promptly inform Atea of its intention not to file and (b) grant Atea the right to file for such Patent Term Extension.

Each Party shall execute such authorizations and other documents and take such other actions as may be reasonably requested by the other Party to obtain such Patent Term Extensions. The Parties shall cooperate with each other in gaining patent term restorations, extensions or SPCs wherever applicable to such Atea Patent Rights, Roche Patent Rights or Joint Patent Rights.

15. Representations and Warranties

15.1 Atea Representations and Warranties.

Atea represents and warrants to Roche as follows as of the Effective Date:

15.1.1Safety Data

Atea has disclosed to Roche and will immediately continue to disclose to Roche (i) the material results of all preclinical testing and human clinical testing of Products in its possession or control and (ii) all material information in its possession or control concerning side effects, injury, toxicity or sensitivity reaction and incidents or severity thereof with respect to Products, if any.

15.1.2Third Party Patent Rights

Atea has no knowledge of the existence of any patent or patent application owned by or licensed to any Third Party, in which the researching, having researched, developing, having developed, registering, having registered, using, having used, making, having made, importing, having imported, exporting, having exported, marketing, having marketed, distributing, having distributed, selling or having sold Compounds, Products and Companion Diagnostics in the Field and in the Roche Territory would infringe a valid and enforceable claim of such patent or patent application (determined as if such application were to issue with substantially the same scope of claim existing as of the Effective Date).

15.1.3Ownership of Patent Rights

Atea is the sole and exclusive owner of the Atea Patent Rights. To Atea’s knowledge, no Third Parties have any right, title or interest in or to the Atea Patent Rights. Except for rights granted under this Agreement, the Atea Patent Rights are free and clear of all liens, claims, security interests and other encumbrances of any kind or nature. Atea has not granted any licenses to the Atea Patent Rights to any Third Party for the development and commercialization of Compounds or Products in the Field in the Roche Territory (excluding rights granted to Third Parties performing activities on behalf of Atea), nor has Atea effectuated any prior transfer, sale or assignment of any part of the Atea Patent Rights.

15.1.4Inventors

Atea warrants that the inventors of the inventions claimed in Atea Patent Rights have transferred to Atea full ownership of the Patent Rights and Know-How licensed to Roche under this Agreement. All of Atea’s employees, officers and consultants performing activities with respect to Compounds and Products have executed agreements requiring assignment to Atea of all inventions made by such individuals during the course of and as a result of their association with Atea.

15.1.5 Grants

To Atea's knowledge, Atea has the lawful right to grant Roche and its Affiliates the rights and licenses described in this Agreement.

15.1.6 Validity of Patent Rights

Atea has no knowledge of information that could reasonably be deemed to render invalid or unenforceable any claims that are in any of the issued Atea Patent Rights. Atea has no knowledge of any inventorship disputes concerning any Atea Patent Rights.

15.1.7 Ownership and Legitimacy of Know-How

Atea's Know-How is legitimately in the possession of Atea and to Atea's knowledge has not been misappropriated from any Third Party. Atea has taken reasonable measures to protect the confidentiality of its Know-How.

15.1.8 No Claims

There are no claims or investigations, pending or, to Atea's knowledge, threatened against Atea or any of its Affiliates, at law or in equity, or before or by any governmental authority (excluding ordinary course prosecution before a patent authority) relating to the matters contemplated under this Agreement or that would materially adversely affect Atea's ability to perform its obligations hereunder.

15.2 Mutual Representations and Warranties

15.2.1 Authorization

The execution, delivery and performance of this Agreement by either Party and all instruments and documents to be delivered by either Party, hereunder: (i) are within the corporate power of such Party; (ii) have been duly authorized by all necessary or proper corporate action; (iii) are not in contravention of any provision of the certificate of formation or limited liability company agreement of such Party; (iv) to the knowledge of such Party, will not violate any law or regulation or any order or decree of any court of governmental instrumentality; (v) will not violate the terms of any indenture, mortgage, deed of trust, lease, agreement, or other instrument to which such Party is a party or by which such Party or any of its property is bound, which violation would have an adverse effect on the financial condition of such Party or on the ability of such Party to perform its obligations hereunder; and (vi) do not require any filing or registration with, or the consent or approval of, any governmental body, agency, authority or any other person, which has not been made or obtained previously (other than Regulatory Approvals required for the sale of Products and filings with Regulatory Authorities required in connection with Products).

15.2.2 No Conflict

Neither Party nor any of its Affiliates is or will be under any obligation to any person, contractual or otherwise, that is conflicting with the terms of this Agreement or that would impede the fulfillment of such Party's obligations hereunder.

15.2.3 Insurance

During the Agreement Term and for a minimum period of [***] years thereafter and for an otherwise longer period as may be required by Applicable Law, each Party will procure and maintain insurance consistent with industry practice or required by Applicable Law, which may be through self-insurance. Such insurance shall insure against liability arising from this Agreement

on the part of either party or any of its respective Affiliates, due to injury, disability or death of any person or persons, or property damage arising from activities performed by such Party or its Affiliates in connection with this Agreement. Any insurance proceeds received by a Party in connection with any indemnified claim shall be retained by such Party and shall not reduce any obligation of the other Party under Article 16 with respect to such claim.

15.2.4 Debarment

Each Party represents and warrants that as of the Effective Date it and its Affiliates and its and their respective employees, in each case involved in the development of the Compounds or the Products under this Agreement, are not debarred under 21 U.S.C. §335a, disqualified under 21 C.F.R. §312.70 or §812.119, sanctioned by a Federal Health Care Program (as defined in 42 U.S.C §1320 a-7b(f)), including the federal Medicare or a state Medicaid program, or debarred, suspended, excluded or otherwise declared ineligible from any other similar federal or state agency or program in the United States or any other country. In the event a Party, any of its Affiliates or an employee of such Party or its Affiliates, in each case involved in development of the Compounds or the Products under this Agreement, receives notice of debarment, suspension, sanction, exclusion, ineligibility or disqualification under the above-referenced statutes or any other similar federal or state agency or program in the United States or any other country, such Party shall immediately notify the other Party in writing.

15.2.5 Anti-Bribery and Anti-Corruption Compliance

Each Party represents and warrants to the other Party that it, with respect to the development, manufacture and commercialization of the Compounds or the Products under this Agreement, has complied and will comply with all Applicable Laws governing bribery, money laundering, and other corrupt practices and behavior.

15.3 No Other Representations and Warranties

EXCEPT AS OTHERWISE PROVIDED IN THIS AGREEMENT, THE FOREGOING REPRESENTATIONS AND WARRANTIES ARE IN LIEU OF ALL OTHER REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF PRODUCTS AND FREEDOM FROM INFRINGEMENT OF THIRD PARTY RIGHTS.

16. Indemnification

16.1 Indemnification by Roche

Roche shall indemnify, hold harmless and defend Atea, Atea's Affiliates and their directors, officers, employees and agents ("**Atea Indemnitees**") from and against any and all losses, damages, expenses, costs of defense (including without limitation reasonable attorneys' fees, witness fees, damages, judgments, fines and amounts paid in settlement) and any other amounts (collectively, "**Losses**") resulting from Third Party claims or suits ("**Third Party Claims**") arising out of or relating to (a) the breach of the Agreement by Roche, (b) the development, manufacture, commercialization, storage, transportation, handling, formulation or other exploitation of Compounds or Products by or on behalf of Roche in the Roche Territory or pursuant to a Unilateral Study conducted by Roche in the Territory (e.g. product liability claims), or (c) the negligence or willful misconduct of Roche Indemnitees, except, in each case (a), (b) and (c), to the extent such Losses are subject to indemnification by Atea pursuant to Section 16.2.

16.2 Indemnification by Atea

Atea shall indemnify, hold harmless and defend Roche, Roche's Affiliates and their directors, officers, employees and agents ("**Roche Indemnitees**") from and against any and all Losses resulting from Third Party Claims arising out of or relating to (a) the breach of the Agreement by Atea, (b) the development, manufacture, commercialization, storage, transportation, handling, formulation or other exploitation of Compounds or Products by or on behalf of Atea in the Atea Territory or pursuant to a Unilateral Study conducted by Atea in the Territory (e.g. product liability claims), or (c) the negligence or willful misconduct of Atea Indemnitees, except, in each case (a), (b) and (c), to the extent such Losses are subject to indemnification by Roche pursuant to Section 16.1.

16.3 Procedure

In the event of a Third Party Claim against a Party entitled to indemnification under this Agreement ("**Indemnified Party**"), the Indemnified Party shall promptly notify the other Party ("**Indemnifying Party**") in writing of the claim and the Indemnifying Party shall undertake and solely manage and control, at its sole expense, the defense of the claim and its settlement. The Indemnified Party shall cooperate with the Indemnifying Party and may, at its option and expense, be represented in any such action or proceeding by counsel of its choice. The Indemnifying Party shall not be liable for any litigation costs or expenses incurred by the Indemnified Party without the Indemnifying Party's written consent. The Indemnifying Party shall not settle any such claim unless such settlement fully and unconditionally releases the Indemnified Party from all liability relating thereto, unless the Indemnified Party otherwise agrees in writing.

17. Liability

17.1 Limitation of Liability

EXCEPT IN THE CASE OF A BREACH OF ARTICLE 18, AND WITHOUT LIMITING THE PARTIES' OBLIGATIONS UNDER ARTICLE 16, NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES (INCLUDING WITHOUT LIMITATION DAMAGES RESULTING FROM LOSS OF USE, LOSS OF PROFITS, INTERRUPTION OR LOSS OF BUSINESS, OR OTHER ECONOMIC LOSS) ARISING OUT OF THIS AGREEMENT OR WITH RESPECT TO A PARTY'S PERFORMANCE OR NON-PERFORMANCE HEREUNDER.

18. Obligation Not to Disclose Confidential Information

18.1 Non-Use and Non-Disclosure

During the Agreement Term and for [***] years thereafter, a Receiving Party shall (i) treat Confidential Information provided by Disclosing Party as it would treat its own information of a similar nature, (ii) take all reasonable precautions not to disclose such Confidential Information to Third Parties, without the Disclosing Party's prior written consent, and (iii) not use such Confidential Information other than for fulfilling its obligations under this Agreement.

18.2 Permitted Disclosure

Notwithstanding the obligation of non-use and non-disclosure set forth in Section 18.1, the Parties recognize the need for certain exceptions to this obligation, specifically set forth below, with respect to press releases, patent rights, publications, certain commercial considerations and for the purposes of complying with Applicable Law.

18.3 Press Releases

The Parties may issue a press release announcing the existence and selected key terms of this Agreement, in a form substantially similar to the template attached as Appendix 18.3.

Subject to the first sentence of this Section 18.3, during the Agreement Term, each Party may only issue press releases making reference to the other Party in connection with this Agreement, this Agreement and/or any activities or information related to this Agreement, that in each case either (i) have been approved by the other Party or (ii) are required to be issued as a matter of Applicable Law (including, for clarity, the rules of any securities exchange). Prior to issuing such press release, the issuing Party shall provide the other Party with a copy of a substantially final draft press release at least [***] (or such shorter amount of time to comply with Applicable Law, including the U.S. Securities Act of 1933 and the U.S. Securities Exchange Act of 1934, and the rules of any securities regulator, where it was not possible to provide the other Party such draft [***] in advance) prior to its intended publication for the other Party's review. The non-issuing Party may provide the issuing Party with suggested modification to the draft press release. The issuing Party shall consider the other Party's suggestions in good faith in issuing its press release.

To ensure communication alignment, responses (if any) to inquiries by media or other Third Parties after issuance of a permitted press release by a Party (solely or jointly with the other Party) shall consist solely of the press release language or shall follow the response guidelines that may be mutually developed by the Parties.

18.4 Publications

During the Agreement Term, the following restrictions shall apply with respect to disclosure by any Party of Confidential Information relating to the Product in any publication or presentation:

a) Both Parties acknowledge that it is their policy for the studies and results thereof to be registered and published in accordance with their internal guidelines. Each Party, in accordance with its internal policies and procedures, shall have the right to publish all studies, clinical trials and results thereof on the clinical trial registries that are maintained by or on behalf of such Party.

b) A Party ("**Publishing Party**") shall provide the other Party with a copy of any proposed publication or presentation at least [***] days (or at least [***] days in the case of oral presentations) prior to submission for publication so as to provide such other Party with an opportunity to recommend any changes it reasonably believes are necessary to continue to maintain the Confidential Information disclosed by the other Party to the Publishing Party in accordance with the requirements of this Agreement. The incorporation of such recommended changes shall not be unreasonably refused; and if such other Party notifies ("**Publishing Notice**") the Publishing Party in writing, within [***] days after receipt of the copy of the proposed publication or presentation (or at least [***] days in the case of oral presentations), that such publication or presentation in its reasonable judgment (i) contains an invention, solely or jointly conceived or reduced to practice by the other Party, for which the other Party reasonably desires to obtain patent protection or (ii) could be expected to have a material adverse effect on the commercial value of any Confidential Information disclosed by the other Party to the Publishing Party, the Publishing Party shall prevent such publication or delay such publication for a mutually agreeable period of time. In the case of inventions disclosed therein, a delay shall be for a period reasonably sufficient to permit the timely preparation and filing of a patent application(s) on such invention, and in no event less than [***] days from the date of the Publishing Notice. With respect to proposed publications from any Clinical Studies conducted pursuant to the Global Development Plan that are not Atea Ongoing Studies or studies in the Retained Indications, the Parties shall also coordinate and collaborate on such publications. In order to facilitate such coordination and collaboration, the Parties shall strive to develop a joint publication strategy, and discuss and review such proposed publications, through the JOC.

18.5 Commercial Considerations

Nothing in this Agreement shall prevent either Party or its Affiliates from disclosing Confidential Information of the other Party to (i) governmental agencies [***] to secure government approval for the development, manufacture or sale of Product in the Territory, including with respect to Roche as permitted in Section 2.1, (ii) Third Parties acting on behalf of such Party, [***] for the development, manufacture or sale of Product in the Territory, as permitted under this Agreement, (iii) [***] or (iv) Third Parties to the extent reasonably necessary to market the Product in the Territory, as set forth in this Agreement. Each Party may further disclose Confidential Information of the other Party, including the terms of this Agreement, to its actual or potential sublicensees; provided that such sublicensees are subject to obligations of confidentiality and non-use with respect to such Confidential Information that are no less restrictive than the obligations of confidentiality and non-use of any Receiving Party pursuant to this Article 18.

18.6 Complying with Applicable Law or Judicial Process

The Receiving Party may disclose Confidential Information of the Disclosing Party to the extent that such Confidential Information is required to be disclosed by the Receiving Party to comply with Applicable Law, including the U.S. Securities Act of 1933 and the U.S. Securities Exchange Act of 1934, to comply with the rules of any securities regulator, to defend or prosecute litigation or to comply with governmental regulations or any judicial process, provided that the Receiving Party provides prior written notice of such disclosure to the Disclosing Party to the extent permitted under Applicable Law and, to the extent practicable, takes reasonable and lawful actions to minimize the degree of such disclosure.

19. Term and Termination

19.1 Commencement and Term

This Agreement shall commence upon the Effective Date and continue for the Agreement Term.

19.2 Termination

19.2.1Termination for Breach

A Party ("**Non-Breaching Party**") shall have the right to terminate this Agreement in its entirety or on a country-by-country basis in the event the other Party ("**Breaching Party**") is in breach of any of its material obligations under this Agreement. The non-Breaching Party shall provide written notice to the Breaching Party, which notice shall identify the breach and the countries in which the Non-Breaching Party intends to have this Agreement terminate. The Breaching Party shall have a period of ninety (90) days after such written notice is provided ("**Peremptory Notice Period**") to cure such breach. If the Breaching Party has a dispute as to whether such breach occurred or has been cured, it will so notify the Non-Breaching Party, and the expiration of the Peremptory Notice Period shall be tolled until such dispute is resolved pursuant to Section 21.2. Upon a determination of breach or failure to cure, the Breaching Party may have the remainder of the Peremptory Notice Period to cure such breach. If such breach is not cured within the Peremptory Notice Period, then absent withdrawal of the Non-Breaching Party's request for termination, this Agreement shall terminate in its entirety or such identified countries effective as of the expiration of the Peremptory Notice Period.

19.2.2Insolvency

A Party shall have the right to terminate this Agreement, if the other Party experiences an Insolvency Event; provided, however, in the case of any involuntary bankruptcy proceeding, such right to terminate shall only become effective if the Party that incurs the Insolvency Event consents to the involuntary bankruptcy or such proceeding is not dismissed within ninety (90) days after the filing thereof.

19.2.3Termination by Roche without a Cause

Roche shall have the right to terminate this Agreement at any time as a whole or on a Product-by-Product or country-by-country basis upon either (i) three (3) months prior written notice if such notice is provided before First Commercial Sale of the first Product under this Agreement, provided that at the time when Roche sends the termination notice under this Section 19.2.3(i) the Post-Exposure Prophylaxis study as described in the Global Development Plan in Appendix 1.47 is not ongoing, but if Roche sends its termination notice under this Section 19.2.3(i) during the time when the Post-Exposure Prophylaxis study as described in the Global Development Plan in Appendix 1.47 is ongoing ("ongoing" shall mean, for the purposes of this Section, that the first patient has been dosed and the last patient has not yet been dosed in such study), then the earlier of the end of such study (but not earlier than three (3) months after the time Roche sends the termination notice), or six (6) months after such termination notice is sent; or (ii) nine (9) months prior written notice if such notice is provided on or after the First Commercial Sale of the first Product under this Agreement. The effective date of termination under this Section 19.2.3 shall be the date three (3) months (as adjusted in accordance with subsection (i) above), or nine (9) months, as the case may be, after Roche provides such written notice to Atea.

19.3 Consequences of Termination

19.3.1Termination by Atea for Breach by Roche or by Roche without a Cause

Upon any termination by Atea for breach by Roche or by Roche without a cause, the rights and licenses granted by Atea to Roche under this Agreement shall terminate in their entirety or on a country-by-country and Product-by-Product basis, as applicable, on the effective date of termination.

If Atea desires to continue development or commercialization of Product(s), Atea shall give a Continuation Election Notice to Roche within [***] days of Atea's notice of termination for breach by Roche or Atea's receipt of Roche's notice of termination without cause. If Roche receives such a timely Continuation Election Notice, and to the extent reasonably requested by Atea:

(a) After the effective date of termination Roche shall, to the extent Roche has the right to do so, transfer and assign to Atea all regulatory filings and approvals, all final pre-clinical and clinical study reports and clinical study protocols, Product Trademarks and all data, including clinical data, in Roche's possession or control related to Product(s) in the Roche Territory necessary for Atea to continue to develop and commercialize the Product(s). All data shall be transferred in the form and format in which it is maintained by Roche. Original paper copies shall only be transferred, if legally required. Roche shall not be required to prepare or finalize any new data, reports or information solely for purposes of transfer to Atea. Roche shall use reasonable efforts to secure from any Sublicensee or Third Party or Affiliate performing activities under this Agreement sufficient rights in and to the foregoing items to enable Roche to provide to Atea all of the foregoing items.

(b) Roche shall assign all clinical trial agreements or other manufacturing or vendor agreements to which Roche is a party related to the Product to the extent legally possible, and to the extent such agreements have not been cancelled and are assignable without Roche paying any consideration or commencing litigation in order to effect an assignment of any such agreement. If Roche cannot assign such agreements it will reasonably cooperate with Atea to enable Atea to negotiate and enter into a separate agreement with the relevant counterparty by, for example, waiving any exclusivity obligations of such counterparty that may prevent Atea from entering into such agreement with such counterparty.

(c) Roche shall and hereby does grant to Atea, effective as of the effective date of termination, an exclusive license under the Roche Know-How and Roche Patent Rights, including Roche's interest in the Joint Patent Rights, solely to the extent necessary to allow Atea, its Affiliates or licensees to develop, make, have made, use, sell, offer to sell, import, and export the Product(s) in the Territory, provided that with respect to any Roche Know-How or Roche Patent Right obtained pursuant to an agreement with a Third Party, Atea assumes all of Roche's obligations (including payment obligations) under such agreement to the extent applicable to such Product(s).

(d) Roche shall assign or license to Atea the Product Trademarks with respect to the Product(s) in the Roche Territory.

(e) Atea shall, upon transfer, have the right to disclose and file such filings, approvals and data to (i) governmental agencies of the relevant country(ies) to the extent required or desirable to secure government approval for the development, manufacture or sale of Product(s) in the Roche Territory; (ii) Third Parties acting on behalf of Atea, its Affiliates or licensees, to the extent reasonably necessary solely for the development, manufacture, or sale of Product(s) in the Roche Territory; or (iii) Third Parties to the extent reasonably necessary to market Product(s) in the Roche Territory.

(f) Roche shall provide reasonable assistance and technical expertise, at Atea's cost, in a technology transfer from Roche to a Third Party designated by Atea with respect to the manufacturing of the Product(s), including the transfer of chemistry, manufacturing and controls processes with respect thereto.

19.3.2 Termination by Roche for Breach by Atea or for Atea Insolvency

Upon any termination by Roche for breach by Atea or Atea's Insolvency Event, the rights and licenses granted by one Party to the other Party under this Agreement shall terminate in their entirety or on a country-by-country and a Product-by-Product basis, as applicable, on the effective date of termination.

19.3.3 Direct License

(a) Irrespective of anything to the contrary in this Agreement, any Compulsory Sublicense shall remain in full force and effect as may be required by Applicable Law, and

(b) any existing, permitted sublicense granted by Roche under Section 2.2 of this Agreement (and any further sublicenses thereunder) shall, upon the written request of Roche, remain in full force and effect, provided that (i) such Sublicensee is not then in breach of its sublicense agreement (and, in the case of termination by Atea for breach by Roche, that such Sublicensee and any further sublicensees did not cause the breach that gave rise to the termination by Atea); and (ii) and such Sublicensee agrees to be bound to Atea under the terms and conditions of such sublicense agreement. Roche shall remain responsible for and shall ensure that each Sublicensee (including any further permitted sublicensee thereof) complies with the terms and conditions of this Agreement.

19.3.4 Other Obligations

19.3.4.1 Obligations Related to Ongoing Activities

If Atea does not provide a timely Continuation Election Notice, then Roche (a) shall have the right to cancel all ongoing obligations and (b) shall complete all non-cancellable obligations at its own expense, except in each case to the extent inconsistent with protecting patient safety.

If Atea provides such timely Continuation Election Notice, then from the date of notice of termination until the effective date of termination, Roche shall continue activities, including preparatory activities, ongoing as of the date of notice of termination unless otherwise agreed by the Parties, with expenses thereof incurred prior to the effective date of termination to be shared equally (50/50) by the Parties consistent with Section 6.2. Such obligation to continue activities may include without limitation continuing to perform under any then-effective contracts applicable to the development, manufacture or commercialization of Compound or Product until completion all of such relevant activities, unless Atea otherwise agrees in writing or requests in writing, subject to Atea's obligations to bear any portion thereof or to pay for any supply of Product as set forth in this Agreement. However, Roche shall not be obliged to initiate any new activities not ongoing at the date of notice of termination.

Except in case Roche terminates for Atea's uncured material breach (Section 19.2.1) or for Atea's insolvency (Section 19.2.2), Roche shall also be solely responsible for any reasonable cancellation or early termination fees that become due under vendor contracts by reason of such termination, if such contracts are not transferred to Atea as provided in Section 19.3.1(b).

After the effective date of termination, Roche shall have no obligation to perform or complete any activities or to make any payments for performing or completing any activities under this Agreement, except as expressly stated herein.

19.3.4.2 Further Supply; Transfer of Inventory

In the case of termination by Atea according to Section 19.2.1 or 19.2.2 or by Roche under Section 19.2.3, upon the request of Atea, Roche shall transfer all of its existing and available clinical supplies and commercial supplies of Products to Atea at [***]. If a Product is marketed in any country of the Territory on the date of the notice of termination of this Agreement, upon the request of Atea, Roche shall manufacture and supply reasonable amounts of such Product to Atea under a manufacturing transfer and transition plan for a period that shall not exceed [***] months from the effective date of the termination of this Agreement at a price to be agreed by the Parties in good faith, but in no event exceeding (i) [***], or (ii) [***]. Atea shall use Commercially Reasonable Efforts to take over the manufacturing as soon as possible after the effective date of termination.

19.3.4.3 Ancillary Agreements

Unless otherwise agreed by the Parties, the termination of this Agreement shall cause the automatic termination of all ancillary agreements related hereto, including but not limited to the Co-Promotion Agreement(s) or, subject to Section 19.3.4.2, Supply Agreement(s), if any, except to the extent such ancillary agreements are related to or necessary for the Parties' activities under this Section 19.3, in which case the relevant agreement(s) shall terminate upon completion of the relevant activity(ies).

19.3.4.4 Limitations on Grant-Backs; Transfer Expenses

For purposes of clarity, irrespective of anything to the contrary in this Agreement:

(a) All transfers and licenses from Roche to Atea (or other obligations of Roche) under Section 19.3 are solely with respect to Product(s) that are not Combination Product(s) or Diagnostic Product(s). Such transfers, licenses and obligations do not extend to other therapeutically active ingredients or products, even if physically mixed, combined or packaged together with a Product, and even if a Product is intended (according to the investigation plan, proposed labeling or actual labeling, as applicable) for use with such other therapeutically active ingredients or products.

(b) In connection with research studies, clinical trials or other activities associated with the development and commercialization of Products, Roche may have collected (i) personally identifiable information about individual human subjects or (ii) human biological samples (collectively, "**PII/Samples**"). Legal and contractual restrictions may apply to such PII/Samples. Roche shall have no obligation to transfer such PII/Samples unless necessary for the continued development of the Product, in which case Roche shall not be obliged to transfer any PII/Samples that Roche in good faith believes would be prohibited or would subject Roche to potential liability by reason of Applicable Law, contractual restrictions or insufficient patient consent; provided that Roche shall notify Atea of the basis for such belief and cooperate with Atea to identify potential means to avoid such lability (including, by way of example, seeking new patient consents). If Roche transfers any such PII/Samples, Atea shall use for the sole purpose of developing and commercializing the Product, and Atea shall be responsible for the correct use of the PII/Samples in line with the informed consent forms ([***]).

(c) Atea shall promptly reimburse Roche for all reasonable out-of-pocket costs and expenses (including FTE Cost charges) incurred by or on behalf of Roche for transfer activities from Roche to Atea under Section 19.3.1 ("**Roche Transfer Activities**"); however transfer activities corresponding to the return of material remains, data, reports, records, documents, regulatory filings and Regulatory Approvals originally provided by Atea to Roche no less than [***] years from the effective date of termination ("**Atea-Originated Transfer Activities**") shall be returned to Atea free of charge. If Atea desires Roche Transfer Activities other than Atea-Originated Transfer Activities, then except as expressly provided above, Atea shall make a payment to Roche of [***] ("**Minimum Transfer Payment**"). [***] Roche shall be under no obligation to provide Roche Transfer Activities (beyond than Atea-Originated Transfer Activities) prior to receipt of the Minimum Transfer Payment or if the Minimum Transfer Payment is received after the effective date of the termination.

(d) Unless otherwise agreed to by the Parties, transfer of physical materials that are required under Roche Transfer Activities shall be delivered[***] (Incoterms 2020).

19.3.4.5 Royalty and Payment Obligations

Termination of this Agreement by a Party, for any reason, shall not release either Party from any obligation to pay royalties or make any payments to the other Party that are payable prior to the effective date of termination. Termination of this Agreement by a Party, for any reason, will release each Party from any obligation to pay royalties or make any payments to the other Party that would otherwise become payable on or after the effective date of termination.

19.4 Survival

Article 1 (Definitions, to the extent necessary to interpret this Agreement), Articles 10, 11 and 12 (Payment, Accounting and Reporting, and Taxes, each to the extent payments accrued but remain unpaid at the effective date of termination), Article 13 (Auditing), Section 14.1 (Ownership of Inventions and Collaboration Know-How); Article 16 (Indemnification), Article 17 (Liability), Article 18 (Obligation Not to Disclose Confidential Information), Section 19.3 (Consequences of Termination), Section 19.4 (Survival), Section 21.1 (Governing Law), Section 21.3 (Arbitration), Section 21.4 (Assignment), and Sections 21.6 (Independent Contractor) – 21.13 (Notice) shall survive any expiration or termination of this Agreement for any reason.

20. Bankruptcy

All licenses (and to the extent applicable rights) granted under or pursuant to this Agreement by Atea to Roche are, and shall otherwise be deemed to be, for purposes of Section 365(n) of Title 11, US Code (the "**Bankruptcy Code**") licenses of rights to "intellectual property" as defined under Section 101(35A) of the Bankruptcy Code. Unless Roche elects to terminate this Agreement, the Parties agree that Roche, as a licensee or sublicensee of such rights under this Agreement, shall retain and may fully exercise all of its rights and elections under the Bankruptcy Code, subject to the continued performance of its obligations under this Agreement.

21. Miscellaneous

21.1 Governing Law

This Agreement shall be governed by and construed in accordance with the laws of New York, without reference to its conflict of laws principles, and shall not be governed by the United Nations Convention of International Contracts on the Sale of Goods (the Vienna Convention).

Notwithstanding anything to the contrary in this Agreement, issues regarding the scope, construction, validity or enforceability of any Patent Rights shall be determined in a court of competent jurisdiction under the local patent laws of the jurisdictions have issued the Patent Rights in question.

21.2 Disputes

Unless otherwise set forth in this Agreement, in the event of any dispute in connection with this Agreement, such dispute shall be referred to the Alliance Directors for resolution for a [***] day period before being escalated to the respective executive officers of the Parties designated below or their designees, who shall use reasonable and good faith efforts to resolve the dispute within [***] days after the date such matter is referred to them. The designated executive officers are as follows:

For Atea: CEO
For Roche: VP, Pharma Partnering

21.3 Arbitration

Except for an Excluded Claim, should the Parties fail to agree on a matter pursuant to Section 21.2 within [***] months after a dispute has first arisen, it shall be finally settled by arbitration in accordance with the Rules of American Arbitration Association (AAA) as in force at the time when initiating the arbitration. The tribunal shall consist of three arbitrators. The place of arbitration shall be New York, New York, US. The language to be used shall be English.

21.4 Assignment

Neither this Agreement nor any of the rights or obligations created herein may be assigned by either Party, in whole or in part, without the prior written consent of the other Party, not to be unreasonably withheld, conditioned or delayed, except that either Party shall be free to assign this Agreement, without the prior consent of the non-assigning Party, (a) to an Affiliate of such Party, provided that such Party shall remain liable and responsible to the other Party for the performance and observance of all such duties and obligations by such Affiliate, or (b) in connection with any merger, consolidation or sale of such Party or sale of all or substantially all of the assets of the Party that relate to this Agreement. Any assignment of this Agreement in contravention of this Section 21.4 is null and void. This Agreement shall bind and inure to the benefit of the successors and permitted assigns of the Parties hereto.

21.5 Effects of Change of Control

If there is a Change of Control, then the Party experiencing such Change of Control ("**Acquired Party**") shall provide written notice to the other Party ("**Non-Acquired Party**") at least [***] days [***] of such Change of Control, subject to any confidentiality obligations of the Acquired Party then in effect [***].

The Change of Control Group in connection with such Change of Control shall agree in writing with the Non-Acquired Party that it will not utilize any of the Non-Acquired Party's Know-How, Patent Rights, Inventions, or Confidential Information or Joint Know-How, Joint Patent Rights or Joint Inventions (collectively, "**Sensitive Information**").

[***] the Non-Acquired Party and the Change of Control Group shall adopt in writing reasonable procedures to prevent the disclosure of Sensitive Information beyond the Acquired Party's personnel who need to know the Sensitive Information solely for the purpose of fulfilling the Acquired Party's obligations under this Agreement. In the event that the Change of Control Group is engaged in [***] (a "**Competing Program**"), then the Acquired Party shall [***] inform the Non-Acquired Party thereof in writing. The Acquired Party shall either [***] or [***]. [***].

21.6 Independent Contractor

No employee or representative of either Party shall have any authority to bind or obligate the other Party to this Agreement for any sum or in any manner whatsoever or to create or impose any contractual or other liability on the other Party without said Party's prior written approval. For all purposes (including U.S. federal and state tax purposes), and notwithstanding any other provision of this Agreement to the contrary, Atea legal relationship to Roche under this Agreement shall be that of independent contractor, and nothing contained in this Agreement shall be deemed or construed to create a partnership, joint venture, employment, franchise, agency or fiduciary relationship between the Parties.

21.7 Unenforceable Provisions and Severability

If any of the provisions of this Agreement are held to be void or unenforceable, then such void or unenforceable provisions shall be replaced by valid and enforceable provisions that will achieve as far as possible the economic business intentions of the Parties. However the remainder of this Agreement will remain in full force and effect, provided that the material interests of the Parties are not affected, i.e. the Parties would presumably have concluded this Agreement without the unenforceable provisions.

21.8 Waiver

The failure by either Party to require strict performance or observance of any obligation, term, provision or condition under this Agreement will neither constitute a waiver thereof nor affect in any way the right of the respective Party to require such performance or observance. The waiver by either Party of a breach of any obligation, term, provision or condition hereunder shall not constitute a waiver of any subsequent breach thereof or of any other obligation, term, provision or condition.

21.9 Interpretation

Except where the context expressly requires otherwise:

(a) the use of any gender herein shall be deemed to encompass references to either or both genders, and the use of the singular shall be deemed to include the plural (and vice versa),

(b) the words "include", "includes" and "including" shall be deemed to be followed by the phrase "without limitation",

(c) the word “will” shall be construed to have the same meaning and effect as the word “shall”,

(d) any definition of or reference to any agreement, instrument or other document herein shall be construed as referring to such agreement, instrument or other document as from time to time amended, supplemented or otherwise modified (subject to any restrictions on such amendments, supplements or modifications set forth herein),

(e) any reference herein to any Party or Third Party or person shall be construed to include the Party’s or Third Party’s or person’s permitted successors and assigns,

(f) the words “herein”, “hereof” and “hereunder”, and words of similar import, shall be construed to refer to this Agreement in its entirety and not to any particular provision hereof,

(g) all references herein to Articles, Sections or Appendices shall be construed to refer to Articles, Sections or Appendices of this Agreement, and references to this Agreement include all Appendices hereto,

(h) references to any specific law, rule or regulation, or article, section or other division thereof, shall be deemed to include the then-current amendments thereto or any replacement or successor law, rule or regulation thereof, and

(i) the term “or” shall be interpreted in the inclusive sense commonly associated with the term “and/or”.

21.10 Entire Understanding

This Agreement contains the entire understanding between the Parties hereto with respect to the within subject matter and supersedes any and all prior agreements, understandings and arrangements, whether written or oral, including the NDA.

21.11 Amendments

No amendments of the terms and conditions of this Agreement shall be binding upon either Party hereto unless in writing and signed by both Parties.

21.12 Invoices

All invoices that are required or permitted hereunder shall be in writing and sent by Atea to Roche at the following address or such other address as Roche may later provide:

F. Hoffmann-La Roche Ltd
Kreditorenbuchhaltung
Grenzacherstrasse 124
4070 Basel
Switzerland
Attn: (name of a Roche contact at time of invoice, e.g. the Alliance Director)

21.13 Notice

All notices that are required or permitted hereunder shall be in writing and sufficient if delivered personally, sent by facsimile (and promptly confirmed by personal delivery, registered or certified mail or overnight courier), sent by nationally recognized overnight courier, sent by registered or certified mail, postage prepaid, return receipt requested, or sent by electronic mail (if to Atea), addressed as follows:

if to Atea, to:	Atea Pharmaceuticals, Inc. 125 Summer Street Boston, Massachusetts 02110 U.S.A. Attn: General Counsel Email: notices@ateapharma.com
with a copy to:	Latham & Watkins LLP 140 Scott Drive Menlo Park, CA 94025 Attn: Judith Hasko
if to Roche, to:	F. Hoffmann-La Roche Ltd [***] Attn: Legal Department
and:	Genentech, Inc. [***] Attn. Corporate Secretary [***]

or to such other address as the Party to whom notice is to be given may have furnished to the other Party in writing in accordance herewith.

[Signature Page Follows]

IN WITNESS WHEREOF, the Parties have entered into this Agreement as of the Effective Date.

Atea Pharmaceuticals, Inc.

/s/ Jean-Pierre Sommadossi
Name: Jean-Pierre Sommadossi, Ph.D.
Title: Chairman & CEO

F. Hoffmann-La Roche Ltd

/s/ Vikas Kabra
Name: Vikas Kabra
Title: Global Head Transaction Excellence

/s/ Stefan Arnold
Name: Stefan Arnold
Title: Head Legal Pharma

Genentech, Inc.

/s/ Edward Harrington
Name: Edward Harrington
Title: CFO, Genentech

Appendix 1.7

Atea Base Patent Rights

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 1.9

Atea Ongoing Studies

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 1.47

Global Development Plan

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 1.66

AT-511

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 1.97

Second Generation Process

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 2.3

Co-Promotion Agreement Terms

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 3

Permitted Third Party Subcontractors

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 8.1.3

Technology Transfer Plan

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 8.2

Supply Agreement Terms

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 8.3.3

Success criteria for manufacturing and release specifications for the Second Generation Process

Omitted pursuant to Regulation S-K, Item 601(a)(5)

Appendix 18.3

Form of Press Release

Atea Form of Press Release

Atea Pharmaceuticals Announces Strategic Collaboration with Roche to Develop and Distribute AT-527 for Patients with COVID-19

Roche Obtains Exclusive Right to Develop and Distribute AT-527 Outside the United States

BOSTON, Mass., October 22, 2020 – Atea Pharmaceuticals, Inc., a clinical stage biopharmaceutical company focused on discovering, developing and commercializing antiviral therapeutics to improve the lives of patients suffering from life-threatening viral infections, today announces that the company has entered into an agreement with Roche (SIX: RO, ROG; OTCQX: RHHBY) for the exclusive rights to research, develop and distribute AT-527 as an oral antiviral treatment for COVID-19 in territories outside of the United States. Under the terms of the agreement, Atea will receive an upfront payment of $350 million in cash from Roche with the potential for future milestone payments and royalties.

“Roche shares our passion for delivering innovative new medicines to address great unmet medical needs. The COVID-19 pandemic has highlighted the urgent need for a novel, oral antiviral to treat this highly infectious and often deadly virus,” said Jean-Pierre Sommadossi, Ph.D., Chief Executive Officer and Founder of Atea Pharmaceuticals. “This collaboration with Roche enhances Atea’s efforts and underscores the potential for AT-527 to effectively address the COVID-19 crisis on a global scale. AT-527 is expected to be ideally suited to combat COVID-19 as it inhibits viral replication by interfering with viral RNA polymerase, a key component in the replication machinery of RNA viruses. Importantly, the manufacturing process for our small molecule direct-acting antiviral allows us to produce AT-527 quickly and at scale.”

“The ongoing complexities of COVID-19 require multiple lines of defence. By joining forces with Atea, we hope to offer an additional treatment option for hospitalised and non-hospitalised COVID-19 patients, and provide important relief for hospital infrastructures during a global pandemic.” said Bill Anderson, Chief Executive Officer of Roche Pharmaceuticals. “In jointly developing and manufacturing AT-527 at scale, we seek to make this treatment option available to as many people around the world as we possibly can.”

About AT-527

AT-527 is an orally administered, direct-acting antiviral agent derived from Atea's purine nucleotide prodrug platform. At-527 is currently under evaluation as a treatment for patients with COVID-19. AT-527 is designed to inhibit viral replication by interfering with viral RNA polymerase, a key component in the replication machinery of RNA viruses, such as positive single-stranded human flaviviruses and human coronaviruses. AT-527 is currently in a global Phase 2 clinical study for hospitalized patients with moderate COVID-19 and has plans to initiate a global, registrational Phase 3 clinical trial in outpatients in the first half of 2021. Additionally, Atea is planning to study in a Phase 3 clinical trial the use of AT-527 in the post-exposure prophylaxis setting.

Advisors

Evercore served as exclusive financial advisor to Atea in connection with this transaction.

About Atea Pharmaceuticals

Atea Pharmaceuticals is a clinical stage biopharmaceutical company engaged in discovering and developing therapies to address the unmet medical needs of patients with severe viral diseases. Our lead programs are focused on the development of orally- administered direct acting antivirals for the treatment of patients with COVID-19 in the hospital and community settings, the treatment of patients with chronic hepatitis C infection, the treatment of patients with dengue, and the treatment of high-risk patients with severe respiratory syncytial virus infection. Our medicinal chemistry, virology, and pharmacology expertise, bolstered by our collective experience in drug development, enables us to pioneer new advancements in antiviral science. Leveraging the power of our purine nucleotide prodrug platform, our goal is to rapidly advance novel drug candidates with optimal therapeutic profiles for RNA virus targets. Founded by its Chairman and Chief Executive Officer, Jean-Pierre Sommadossi, PhD, Atea began operations in 2014 and is headquartered in Boston, MA. For more information about Atea and our pipeline of product candidates please visit our company website at www.ateapharma.com.

Contacts

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Will O'Connor
Stern Investor Relations
212-362-1200
will.oconnor@sternir.com

Media:
Carol Guaccero
301-606-4722
contactus@ateapharma.com

Roche Form of Press Release

Roche announces collaboration with Atea Pharmaceuticals to develop a potential oral treatment for COVID-19 patients

- *Roche and Atea partner to jointly develop AT-527, an orally administered direct-acting antiviral (DAA) currently in Phase 2 clinical trials*
- *AT-527 has the potential to be the first novel oral antiviral to treat COVID-19 patients outside the hospital setting as well as in the hospital and may also be used in* post-exposure prophylactic settings
- *Oral, small-molecule DAAs for COVID-19 patients allow for large-scale manufacturing and facilitate broad patient access*
- *If approved, Atea will distribute AT-527 in the United States and Roche will be responsible for global manufacturing and distribution outside the United States*

Basel, xx October 2020—Roche (SIX: RO, ROG; OTCQX: RHHBY) and Atea Pharmaceuticals, Inc. announced today that they are joining forces in the fight against COVID-19 to develop, manufacture and distribute AT-527, Atea's investigational oral direct-acting antiviral, to people around the globe. AT-527 acts by blocking the viral RNA polymerase enzyme needed for viral replication, and is currently being studied in a Phase 2 clinical trial for hospitalised patients with moderate COVID-19. A Phase 3 clinical trial, expected to start in Q1 2021, will explore the potential use in patients outside of the hospital setting. In addition, AT-527 may be developed for post-exposure prophylactic settings.

AT-527, while being a potential oral treatment option for hospitalised patients, also holds the potential to be the first oral treatment option for COVID-19 patients that are not hospitalised. Additionally, the manufacturing process of small-molecule DAAs allows the ability to produce large quantities of a much needed treatment. If successful, AT-527 could help treat patients early, reduce the progression of the infection, and contribute to decreasing the overall burden on health systems.

The collaboration aims to accelerate the clinical development and manufacturing of AT-527, to investigate its safety and efficacy, and to provide this potential treatment option to patients around the world as quickly as possible. If AT-527 proves safe and effective in clinical trials and regulatory approvals are granted, Atea will be responsible for distributing this treatment option in the U.S, with the option to request Genentech's support, and Roche will be responsible for distribution outside the United States.

"The ongoing complexities of COVID-19 require multiple lines of defence. By joining forces with Atea, we hope to offer an additional treatment option for hospitalised and non-hospitalised COVID-19 patients, and to ease the burden on hospitals during a global pandemic." said Bill Anderson, Chief Executive Officer of Roche Pharmaceuticals. "In jointly developing and manufacturing AT-527 at scale, we seek to make this treatment option available to as many people around the world as we possibly can."

“Roche shares our passion for delivering innovative new medicines to address great unmet medical needs. The COVID-19 pandemic has highlighted the urgent need for a novel, oral antiviral to treat this highly infectious and often deadly virus,” said Jean-Pierre Sommadossi, Ph.D., Chief Executive Officer and Founder of Atea Pharmaceuticals. “AT-527 is expected to be ideally suited to combat COVID-19 as it inhibits viral replication by interfering with viral RNA polymerase, a key component in the replication machinery of RNA viruses. Importantly, the manufacturing process for our small molecule direct-acting antiviral allows us to produce AT-527 quickly and at scale.”

About AT-527

AT-527 is an investigational, oral, purine nucleotide prodrug, which has demonstrated in vitro and in vivo antiviral activity against several enveloped single-stranded RNA viruses, including human flaviviruses and coronaviruses. This highly selective purine nucleotide prodrug was designed to uniquely inhibit viral RNA dependent RNA polymerase, an enzyme that is essential for the replication of RNA viruses. Antiviral activity and safety of AT-527 has been demonstrated in Phase 2 clinical studies of hepatitis C patients, and in preclinical in-vitro assays with SARS-CoV2 virus. AT-527 is not yet licensed or approved for any indication in the United States or any other country.

About Roche’s response to the COVID-19 pandemic

As a leading healthcare company we are doing all we can to support countries in minimising the impact of COVID-19. We have developed a growing number of diagnostic solutions that help to detect and diagnose the infection in patients, as well as providing digital support to healthcare systems, and we continue to identify, develop and support potential therapies which can play a role in treating the disease.

We understand the impact of COVID-19 goes beyond those who contract it, which is why we are working with healthcare providers, laboratories, authorities and organisations to help make sure that patients continue to receive the tests, treatment and care they need during these challenging times. As we learn from the pandemic, we are partnering with governments and others to make healthcare stronger and more sustainable in the future.

Our diagnostics solutions:

Reliable, high-quality testing is essential to help healthcare systems overcome this pandemic. Our portfolio includes:

- a high-volume molecular test to detect SARS-CoV-2, the virus that causes COVID-19, (FDA Emergency Use Authorisation (EUA) and available in countries accepting the CE Mark)
- a SARS-CoV-2 laboratory-based antibody test, aimed at detecting the presence of antibodies in the blood targeting the nucleocapsid (FDA EUA and CE Mark)
- an IL-6 test to assist in identifying severe inflammatory response in patients with confirmed COVID-19 (FDA EUA and CE Mark)
- Roche v-TAC, which could help simplify the screening, diagnosis and monitoring of patients with respiratory compromise in the current COVID-19 pandemic
- a SARS-CoV-2 rapid antibody test to help determine at the point of care whether a person has been exposed to the virus (CE Mark)

- a rapid antigen test to support in the detection of SARS-CoV-2 at the point of care within 15 minutes (CE Mark)
- a high-volume molecular test to simultaneously detect and differentiate between SARS-CoV-2 and influenza A/B, as the symptoms are similar for both (FDA EUA and CE Mark)
- a second SARS-CoV-2 antibody test, aimed at measuring the spike protein to support vaccination development and complement our existing portfolio
- a point-of-care molecular PCR test that simultaneously detects and differentiates between SARS-CoV-2 and influenza A/B infections to support urgent triage and diagnosis (FDA EUA and CE Mark)

Our research into therapies:

Roche is committed to improving the treatment of COVID-19. We are actively involved in understanding the potential of our existing portfolio and are exploring the potential of our investigational molecules.

In August, we announced a partnership with Regeneron to develop, manufacture, and increase global supply of their investigational antibody combination for COVID-19 if it proves safe and effective in clinical trials and regulatory approvals are granted.

At the beginning of the pandemic, on 19 March, we announced the initiation of COVACTA— a global Phase III randomised, double-blind, placebo-controlled clinical trial to evaluate the safety and efficacy of intravenous Actemra©/RoActemra© (tocilizumab) plus standard of care in hospitalised adult patients with severe COVID-19 pneumonia compared to placebo plus standard of care. On 29 July we announced that COVACTA did not meet its primary endpoint of improved clinical status in patients with COVID-19 associated pneumonia or the key secondary endpoint of reduced mortality.

Separately, we have studied Actemra©/RoActemra© in the EMPACTA study in COVID-19 associated hospitalised pneumonia in patients that are often underrepresented in clinical trials. On 18 September we announced that the phase III EMPACTA study showed Actemra/RoActemra plus standard of care reduced the likelihood of progression to mechanical ventilation or death in hospitalised patients with COVID-19 associated pneumonia compared to placebo plus standard of care. However, there was no statistical difference in mortality between patients who received Actemra/RoActemra or placebo

Actemra©/RoActemra© is also being studied in combination with the investigational antiviral remdesivir in hospitalised patients with severe COVID-19 pneumonia in the REMDACTA trial in partnership with Gilead, announced 28 May. Actemra©/RoActemra© is not approved by any health authority for use in COVID-19 pneumonia. Roche has further initiated an internal early research programme focused on the development of medicines for COVID-19 and is engaged in multiple research collaborations.

In these exceptional times, Roche stands together with governments, healthcare providers and all those working to overcome the pandemic.

About Roche

Roche is a global pioneer in pharmaceuticals and diagnostics focused on advancing science to improve people's lives. The combined strengths of pharmaceuticals and diagnostics under one roof have made Roche the leader in personalised healthcare – a strategy that aims to fit the right treatment to each patient in the best way possible.

Roche is the world's largest biotech company, with truly differentiated medicines in oncology, immunology, infectious diseases, ophthalmology and diseases of the central nervous system. Roche is also the world leader in in vitro diagnostics and tissue-based cancer diagnostics, and a frontrunner in diabetes management.

Founded in 1896, Roche continues to search for better ways to prevent, diagnose and treat diseases and make a sustainable contribution to society. The company also aims to improve patient access to medical innovations by working with all relevant stakeholders. More than thirty medicines developed by Roche are included in the World Health Organization Model Lists of Essential Medicines, among them life-saving antibiotics, antimalarials and cancer medicines. Moreover, for the eleventh consecutive year, Roche has been recognised as one of the most sustainable companies in the Pharmaceuticals Industry by the Dow Jones Sustainability Indices (DJSI).

The Roche Group, headquartered in Basel, Switzerland, is active in over 100 countries and in 2019 employed about 98,000 people worldwide. In 2019, Roche invested CHF 11.7 billion in R&D and posted sales of CHF 61.5 billion. Genentech, in the United States, is a wholly owned member of the Roche Group. Roche is the majority shareholder in Chugai Pharmaceutical, Japan. For more information, please visit www.roche.com.

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Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Atea Pharmaceuticals, Inc.:

We consent to the use of our report included herein and to the reference to our firm under the heading “Experts” in the prospectus.

/s/ KPMG LLP

Boston, Massachusetts
October 22, 2020