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

FORM 10-K

(Mark One)
☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2021
OR
☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 FOR THE TRANSITION PERIOD FROM TO**

Commission File Number 001-39503

Athira Pharma, Inc.
(Exact name of registrant as specified in its charter)

Delaware	**45-3368487**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

18706 North Creek Parkway, Suite 104
Bothell, Washington 98011
(Address of principal executive officer)
(425) 620-8501
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common Stock, $0.0001 par value per share	ATHA	The Nasdaq Stock Market LLC (The Nasdaq Global Select Market)

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES ☐ NO ☒

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. YES ☐ NO ☒

Indicate by check mark whether the Registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES ☒ NO ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). YES ☒ NO ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES ☐ NO ☒

The aggregate market value of the common stock held by non-affiliates of the registrant, based on the closing price of the shares of common stock on June 30, 2021 (the last business day of the registrant's most recently completed second fiscal quarter) as reported by The Nasdaq Stock Market LLC on such date was approximately $328.3 million. Shares of the registrant's common stock held by each executive officer and director and by each other person who may be deemed to be an affiliate of the registrant have been excluded from this computation. This calculation does not reflect a determination that certain persons are affiliates of the registrant for any other purpose.

The number of shares of Registrant's Common Stock outstanding as of March 21, 2022 was 37,624,058.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement to be delivered to stockholders in connection with the 2022 annual meeting of stockholders are incorporated by reference into Part III of this Annual Report on Form 10-K. Such proxy statement will be filed with the Securities and Exchange Commission not later than 120 days following the end of the Registrant's fiscal year ended December 31, 2021.

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Summary Risk Factors

Our business is subject to numerous risks and uncertainties, including those highlighted in the section of this report captioned "Risk Factors." The following is a summary of the principal risks we face:

- We are a late clinical-stage biopharmaceutical company with a limited operating history.
- Our ability to generate revenue and achieve profitability depends significantly on our ability to achieve a number of objectives.
- Our development of fosgonimeton may never lead to a marketable product.
- Our approach to targeting brain growth factors through the use of small molecules is based on a novel therapeutic approach, which exposes us to unforeseen risks. We have limited data from our Phase 1a/1b clinical trial, including only 11 patients with mild to moderate Alzheimer's disease, and we cannot be certain that future trials will yield similar data. In addition, our use of electroencephalogram methods to gather data requires placement of electrodes on a subject's scalp and, if not properly placed, we may be unable to obtain the data sought or data obtained may be unreliable.
- We have concentrated our research and development efforts on the treatment of central nervous system and peripheral degenerative disorders, a field that has seen very limited success in product development.
- An independent special committee of our board of directors engaged in a review of papers co-authored by our former chief executive officer in connection with her doctoral research at Washington State University. The special committee's findings included that (i) our former chief executive officer altered images in her 2011 doctoral dissertation and at least four research papers that she co-authored while a graduate student at Washington State University, and published from 2011 to 2014, (ii) that we cited challenged research papers in certain communications and applications, and (iii) that WSU's dihexa patent, exclusively licensed to us, incorporated certain of these altered images. Washington State University has undertaken a review of claims of potential research misconduct involving our former chief executive officer's doctoral research at Washington State University. We cannot predict when WSU's investigation will be completed or what conclusions WSU will reach.
- Clinical development involves a lengthy and expensive process with an uncertain outcome, and results of early, smaller-scale preclinical studies and clinical trials with a single or few clinical trial sites may not be predictive of eventual safety or effectiveness in large-scale pivotal clinical trials across multiple clinical trial sites. We may encounter substantial delays in clinical trials, or may not be able to conduct or complete clinical trials on the expected timelines, if at all.
- If we experience delays or difficulties in the enrollment and/or retention of patients in clinical trials, our regulatory submissions or receipt of necessary marketing approvals could be delayed or prevented.
- The loss of any of our key personnel could significantly harm our business, results of operations and competitive position.
- We face significant competition, and if our competitors develop and market technologies or products more rapidly than we do or that are more effective, safer, or less expensive than the product candidates we develop, our commercial opportunities will be negatively impacted.
- We may expend our limited resources to pursue a particular product candidate or indication and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.
- The continuing effects of the novel coronavirus disease, or COVID-19, pandemic could adversely impact our business, including our nonclinical studies and clinical trials.
- We have incurred significant losses since our inception and anticipate that we will continue to incur significant losses for the foreseeable future.

- We will require substantial additional funding to finance our operations, complete the development and commercialization of fosgonimeton, and evaluate other and future product candidates. If we are unable to raise this funding when needed, we may be forced to delay, reduce, or eliminate our product development programs or other operations.
- The regulatory approval processes of the U.S. Food and Drug Administration and other comparable foreign regulatory authorities are lengthy, time consuming and inherently unpredictable. If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals for our product candidates, we will not be able to commercialize, or will be delayed in commercializing, our product candidates, and our ability to generate revenue will be materially impaired.
- We rely on third parties to conduct our nonclinical studies and clinical trials. If these third parties do not properly and successfully carry out their contractual duties or meet expected deadlines, we may not be able to obtain regulatory approval of or commercialize our product candidates.
- Even if approved, our product candidates may not achieve adequate market acceptance among physicians, patients, healthcare payors and others in the medical community necessary for commercial success.
- We have never commercialized a product candidate before and may lack the necessary expertise, personnel and resources to successfully commercialize any products on our own or together with suitable collaborators.
- Our success depends on our ability to protect our intellectual property and our proprietary technologies.
- If the scope of any patent protection we obtain is not sufficiently broad, or if we lose any of our patent protection, our ability to prevent our competitors from commercializing similar or identical product candidates would be adversely affected.
- The market price of our common stock may be volatile, which could result in substantial losses for investors.
- We and certain of our directors and executive officers have been named as defendants in lawsuits that could result in substantial costs and divert management's attention.
- Actions of an activist stockholder against us have been disruptive and costly and the notice the activist stockholder has sent indicating he will wage a proxy contest and seek representation on our board of directors could cause uncertainty about the strategic direction of our business.

Our Risk Factors are not guarantees that no such conditions exist as of the date of this report and should not be interpreted as an affirmative statement that such risks or conditions have not materialized, in whole or in part.

PART I

Special Note Regarding Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements that are based on our management's beliefs and assumptions and on information currently available to our management. This section should be read in conjunction with our audited consolidated financial statements and related notes included in Part II, Item 8 of this report. The statements contained in this report that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended.

In some cases, you can identify forward- looking statements by the following words: "anticipate," "believe," "continue," "could," "estimate," "expect," "intend," "may," "ongoing," "plan," "potential," "predict," "project," "should," "target", "will," "would" or the negative of these terms or other comparable terminology, although not all forward-looking statements contain these words. You should read these statements carefully because they discuss future expectations, contain projections of future results of operations or financial condition, or state other "forward-looking" information. These statements relate to our future plans, objectives, expectations, intentions and financial performance and the assumptions that underlie these statements. These forward-looking statements include, but are not limited to, statements about:

- our financial performance;
- the sufficiency of our existing cash, cash equivalents and investments to fund our future operating expenses and capital expenditure requirements;
- our ability to obtain funding for our operations, including funding necessary to develop and commercialize our product candidates;
- the ability of our nonclinical studies and clinical trials to demonstrate safety and efficacy of our product candidates;
- the success, cost and timing of our development activities, nonclinical studies and clinical trials;
- the rate and degree of market acceptance of our product candidates;
- the timing or likelihood of regulatory filings and approvals;
- the timing and focus of our future clinical trials, and the reporting of data from those trials;
- our plans relating to commercializing our product candidates, if approved;
- our plans and ability to establish sales, marketing and distribution infrastructure to commercialize any product candidates for which we obtain approval;
- our ability to attract and retain key managerial, scientific and clinical personnel;
- our ability to contract with third-party suppliers and manufacturers and their ability to perform adequately;
- the accuracy of our estimates regarding expenses, future revenue, capital requirements and needs for additional financing;
- the pricing and reimbursement of our product candidates, if approved;
- our reliance on third parties to conduct clinical trials of our product candidates, and for the manufacture of our product candidates for nonclinical studies and clinical trials;
- our ability to expand our product candidates into additional indications and patient populations;
- the success of competing therapies that are or may become available;
- the beneficial characteristics, safety and efficacy of our product candidates;
- regulatory developments in the United States and other jurisdictions;

- our ability to obtain and maintain regulatory approval of our product candidates in the United States and other jurisdictions, and any related restrictions, limitations and/or warnings in the label of any approved product candidate;
- future agreements with third parties in connection with the commercialization of our product candidates;
- our plans relating to the further development and manufacturing of our product candidates, including additional indications for which we may pursue regulatory approval;
- our plans and ability to obtain or protect intellectual property rights, including extensions of existing patent terms where available;
- the scope of protection we are able to establish and maintain for intellectual property rights covering our product candidates and technology;
- the outcome of legal proceedings which have been or may in the future be instituted against us and certain of our directors and officers, including the legal proceedings discussed in Part I, Item 3 — "Legal Proceedings," and elsewhere in this report;
- the actions of an activist stockholder against us, which have been disruptive and costly, and the outcome of any proxy contest, which could cause uncertainty about the strategic direction of our business;
- our expectations regarding the continuing impact of COVID-19 on our business;
- the size and growth potential of the markets for our product candidates, if approved for commercial use, and our ability to serve those markets;
- the potential benefits of any strategic collaboration agreements we may enter into; and
- our expectations regarding the time during which we will be an emerging growth company under the JOBS Act.

These forward-looking statements are subject to certain risks and uncertainties that could cause actual results to differ materially from those anticipated in the forward-looking statements. Factors that might cause such a difference include, but are not limited to, those discussed in this report in Part I, Item 1A — "Risk Factors," and elsewhere in this report. These statements, like all statements in this report, speak only as of their date, and we undertake no obligation to update or revise these statements in light of future developments. Our Risk Factors are not guarantees that no such conditions exist as of the date of this report and should not be interpreted as an affirmative statement that such risks or conditions have not materialized, in whole or in part.

In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this report, and although we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted a thorough inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and you are cautioned not to unduly rely upon these statements.

This report includes our trademarks and registered trademarks, including Athira, Athira Pharma, the Athira logo, and other trademarks or service marks of Athira. Each other trademark, trade name or service mark appearing in this report belongs to its holder.

In this report, "we," "our," "us," "Athira," and "the Company" refer to Athira Pharma, Inc.

Item 1. Business.

Overview

Athira is derived from the word Athir, the energy that reaches everyone. It captures our mission to restore lives by advancing bold therapies for neuronal health, thoughtfully and urgently. We aim to restore neuronal health for those suffering from devastating neurological diseases, including Alzheimer's, Parkinson's, and neuropsychiatric diseases, so that patients can regain their memories, lives, and family relationships.

We are a late clinical-stage biopharmaceutical company focused on developing small molecules to restore neuronal health and slow neurodegeneration. With our product candidates, we aim to provide rapid cognitive improvement and alter the course of neurological diseases, leveraging our novel mechanism of action. Our approach is designed to augment neuronal growth factor signaling through the hepatocyte growth factor/MET, or HGF/MET, a naturally occurring, repair and regenerative system. We believe enhancing HGF/MET signaling has the potential to protect existing neurons from damage, reduce inflammation, promote regeneration, and benefit brain physiology. We anticipate that all of these characteristics may improve neuronal health and translate into clinical benefits. Our pipeline is built from our proprietary drug discovery platform, or ATH platform, and consists of a series of small molecules that are designed to target either (1) the central nervous system, or CNS, by crossing the blood brain barrier, or BBB, or (2) the peripheral nervous system.

Our lead candidate, fosgonimeton (ATH-1017), is a subcutaneously administered, BBB-penetrating, small molecule HGF/MET positive modulator. The primary target indication is Alzheimer's disease (AD). In our Phase 1a/b clinical trial, fosgonimeton was well tolerated in healthy young and elderly volunteers and AD subjects, without serious adverse events. This clinical trial recruited 88 subjects, including 11 AD subjects with mild to moderate AD, who were randomly assigned to active and control groups. Nonclinical studies and Phase 1 clinical trials with fosgonimeton demonstrated improvements in brain network activity indicating potentially positive effects on brain function. In AD subjects, multiple dosing of fosgonimeton significantly improved Event Related Potential (ERP) P300 latency. ERP P300 latency is a functional measure that is highly correlated with cognition; however, we have not yet established a connection between these ERP P300 latency results and improved cognition. In September 2020, we began site initiation and patient screening for LIFT-AD, our Phase 2/3 clinical trial with fosgonimeton designed with the potential to provide pivotal data in support of registration, for the treatment of mild-to-moderate AD, with topline results expected in the first half of 2023. In November 2020, we also initiated ACT-AD, a proof-of-concept Phase 2 clinical trial with ERP P300 latency as the primary endpoint, in mild-to-moderate AD, which trial is designed to better characterize the overall effects of fosgonimeton on working memory processing speed and cognitive measures, with topline results expected in the second quarter of 2022. In July 2021, we announced that we are enrolling patients into a 26-week open-label extension study for our LIFT-AD and ACT-AD clinical trials, which will allow us to collect up to a total of one year of safety and other data with fosgonimeton. In October 2021, we announced that we completed patient enrollment in our ACT-AD clinical trial. In January 2022, we increased the LIFT-AD study sample size by approximately 120 participants, from 300 to 420, to strengthen the statistical power of co-key secondary endpoints, including ADAS-Cog11.

The primary focus of our Phase 1a/b clinical trial of fosgonimeton was to establish safety and obtain single plus multiple dose pharmacokinetics. Fosgonimeton was well tolerated at all tested doses, produced predictable pharmacokinetics with dose-linear exposures, and did not accumulate over the course of treatment. Pharmacodynamic measures evaluating brain penetration, target engagement and brain function with quantitative electroencephalography, or qEEG, methods produced a strong suite of data justifying further investigation of fosgonimeton in future clinical trials. Individuals with AD typically experience a general slowing of qEEG, including a reduction in higher frequency waves, such as gamma. Gamma power is typically associated with learning, memory and cognitive function. Administration of fosgonimeton treatment increased gamma power activity with a single dose in both young healthy volunteers and elderly healthy volunteers. Gamma power also improved in AD subjects. ERP P300 latency, a functional measure of working memory processing speed and executive function that highly correlates with cognition, was also substantially improved in AD subjects. After a single dose of fosgonimeton, all AD subjects started improving on ERP P300 latency, and by the end of the once-daily 8-day treatment cycle, average ERP P300 latency across the AD treatment group had improved by 73 milliseconds, a statistically

significant change compared to the placebo group that did not show any directional change. These results suggest that fosgonimeton has the potential to substantially improve synaptic connectivity and brain function in AD subjects.

AD is a significant unmet medical need with currently 35 million cases estimated worldwide and no treatments that can significantly reduce the burden on individuals and families impacted by the disease. Failures of approaches targeting specific hypotheses of underlying AD pathology highlight the need for novel strategies to address the disease. Regardless of the underlying pathology, it has been established that the loss of synaptic density and breakdown of neuronal network connectivity leads to cognitive impairment in subjects with AD and other forms of dementia. We believe the enhancement of the HGF/MET neurotrophic system in the brain will lead to increased synaptic density, network recovery and information transmission in the brain, which could ultimately result in cognitive improvement and clinical benefit.

Fosgonimeton has the potential to address the broader dementia patient population beyond AD. Therefore, at the end of 2021, we initiated a 26-week, double-blind Phase 2 proof-of-concept trial for the treatment of Parkinson's disease dementia (PDD) and Dementia with Lewy Bodies (DLB). Dementia is a significant unmet medical need affecting over 55 million people worldwide. Given underlying healthcare trends, specifically the aging population globally, the prevalence of dementia is expected to grow significantly and almost triple by 2050.

We are pioneering the use of small molecules that are designed to enhance the HGF/MET neurotrophic system, a naturally occurring regenerative system, in neurological diseases. While discovered in the liver, HGF is a critical growth factor across multiple organs, including in the brain. HGF/MET has long been known as a promising therapeutic target for CNS disorders; however, delivery of large proteins or gene therapy to the CNS to augment HGF/MET is challenging due to the invasive methods needed for them to bypass the BBB and the risk of potential adverse immune response. Our novel BBB-penetrating small molecules are designed to overcome many of these hurdles, allowing us to efficiently tap into the regenerative potential of HGF/MET. For therapeutic applications in CNS disorders, particularly AD, treatments that target neuronal growth factors can potentially accomplish several therapeutic goals, including rapid cognitive improvement and sustained neuroprotective effects.

It is our goal to establish in current and future clinical trials that our ATH platform, which is designed to enhance the body's natural repair mechanism of HGF/MET, can potentially address a wide range of clinical applications ranging from CNS disorders, such as AD, PDD/DLB, multiple sclerosis, or MS, and amyotrophic lateral sclerosis, or ALS, to more peripheral conditions such as peripheral neuropathy. In addition, pre-existing literature suggests that HGF/MET biology plays a role in neuropsychiatric indications such as depression, anxiety and schizophrenia.

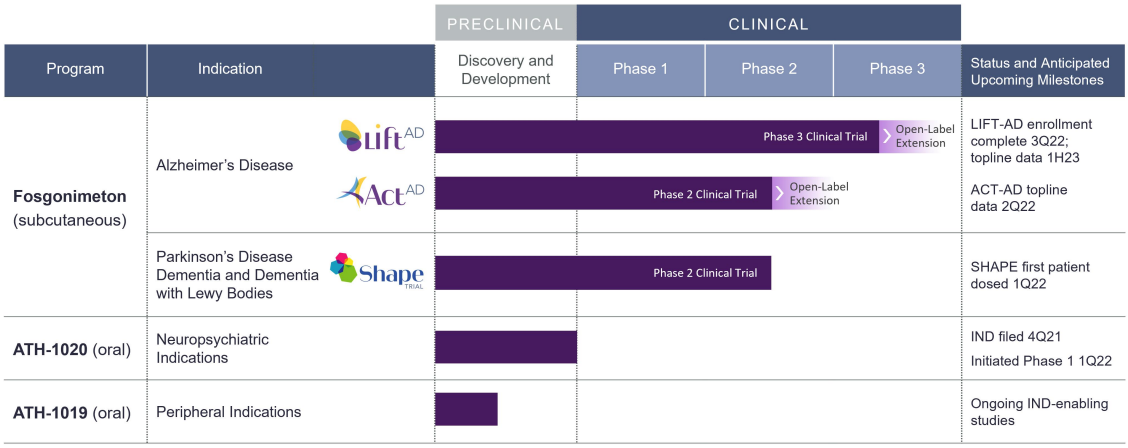
Our product candidate for our neuropsychiatric program is ATH-1020. ATH-1020 is a new compound for which we recently filed an Investigational New Drug (IND) application with the FDA at the end of 2021, and received notice of acceptance in January 2022. ATH-1020 is a novel small molecule compound designed to be an orally available once-daily treatment, to enhance the HGF/MET system, and to distribute to the CNS. In vivo testing has demonstrated that following oral delivery, ATH-1020 distributes to the brain and is neuroactive in animals, and has demonstrated anti-depressant effects in several models of depression, including the forced swim model of depression. A first-in-human Phase 1 study in healthy volunteers was initiated during the first quarter of 2022.

Currently, we have several preclinical candidates for non-AD indications, including ATH-1019, which is being developed to address peripheral indications such as peripheral neuropathy. Late-stage non-clinical development work and potentially early clinical studies will support decisions on selection of further product candidates and target indications moving forward. Our ATH platform allows us the flexibility to engineer compounds that are BBB-penetrant or that generate specific activity in the periphery, and molecules that are suitable for the subcutaneous or oral routes of administration.

Our Pipeline

Figure 1 below illustrates the current development stage of our ATH compounds and discovery and development programs. In addition, we are expanding our ATH platform to additional indications in the CNS and peripheral nervous system as we aim to improve neuronal health in multiple disorders. Our drug discovery efforts are focused on exploring the potential of ATH technology, which is designed to promote HGF/MET activity for a variety of clinical applications.

Figure 1. Summary of Our Preclinical and Clinical ATH Programs.



The fosgonimeton LIFT-AD Phase 3 clinical trial may provide pivotal data in support of registration with the FDA.

Our Strategy

We intend to create, develop, and commercialize therapeutics with the potential to transform lives by repairing, restoring, and reversing the damage to nerve cells throughout the body. Key aspects of our business strategy to achieve these goals are to:

- *Advance fosgonimeton through clinical development for AD*. We believe fosgonimeton has the potential to rapidly improve cognition and durably improve the lives of the millions of people suffering from AD who currently have limited therapeutic options. We initiated one clinical trial for AD in September 2020 and an additional clinical trial for AD in November 2020 to potentially accelerate our development timelines and further inform our development decisions. The first of these clinical trials is LIFT-AD, our Phase 3 clinical trial evaluating the holistic impact of fosgonimeton in AD, initiated in September 2020 with topline results expected in the first half of 2023, which results may provide pivotal evidence in support of registration. The second clinical trial is our ACT-AD ERP P300 Phase 2 proof-of-concept clinical trial for AD evaluating the overall effects of fosgonimeton on working memory processing speed and cognitive measures, initiated in November 2020 with topline results expected in the second quarter of 2022.
- *Expand the development of fosgonimeton to include additional dementia indications.*We are developing fosgonimeton as a treatment for mild-to-moderate AD, but over time we aim to expand development to cover all stages of AD. Beyond AD, we believe that fosgonimeton can ultimately address a broader dementia patient population, irrespective of cause. To begin this expansion, we initiated a Phase 2 proof-of-concept clinical trial for PDD and DLB at the end of 2021, dosing the first patient in the first quarter of 2022.
- *Focus on translational and functional endpoints to efficiently develop product candidates*. We intend to use highly translatable and predictive measures, such as qEEG and ERP methods, early in development to guide clinical dose decisions, provide predictive and quantitative measures for potential clinical benefit, and advance product candidates through clinical development. We have focused on changes in cognitive processing and function, coupled with

measures of brain function with qEEG and ERP P300 latency, allowing for more efficient and cost-effective clinical trials.

- *Advance innovative research to expand and develop our preclinical and clinical pipeline*. Our strategy is to only advance product candidates that show both strong pharmacokinetics and pharmacodynamics (PK/PD) translation and early predictive clinical data. We plan to continue growing our discovery organization in the field of neuronal health and regeneration by building on our strong foundational knowledge of neuronal network, behavior, and translatable measures. It is our goal to establish in current and future clinical trials that our ATH platform, which is designed to enhance the body's regenerative mechanism of HGF/MET, can potentially address a wide range of clinical applications ranging from CNS disorders, such as AD, PDD/DLB, MS, and ALS, to peripheral conditions such as peripheral neuropathy. In addition, we believe that HGF/MET biology plays a role in neuropsychiatric indications such as depression, anxiety, and schizophrenia.
- *Optimize the value of fosgonimeton and other candidates in major markets*. We own worldwide rights to fosgonimeton as well as our pipeline of proprietary small molecule candidates. We plan to develop and pursue approval of fosgonimeton and other future candidates in major markets. Where appropriate, we may use strategic collaborations or partnerships to accelerate development and maximize the commercial potential of our programs.

Addressing the Key Aspects of Neuronal Health and Alzheimer's Disease

Maintenance of neuronal health is critical to preserving normal neuronal and brain function. Several neurodegenerative diseases, such as AD, PDD/DLB, MS, and ALS, share a common consequence of continued neuronal damage and death that ultimately lead to progressive impairment of the neuronal network and loss of both cognitive and general functions. Globally, these diseases affect millions of people.

AD, our initial focus, is a progressive dementia caused by widespread neurodegeneration. The causal pathophysiological mechanism of AD has yet to be identified. This fundamental lack of understanding, combined with the complex range of pathological features, has led to a history of late-stage drug development failures. Regardless of the underlying pathology, it has been established that the loss of synaptic density and breakdown of the neuronal network lead to cognitive impairment in subjects with AD and other forms of dementia.

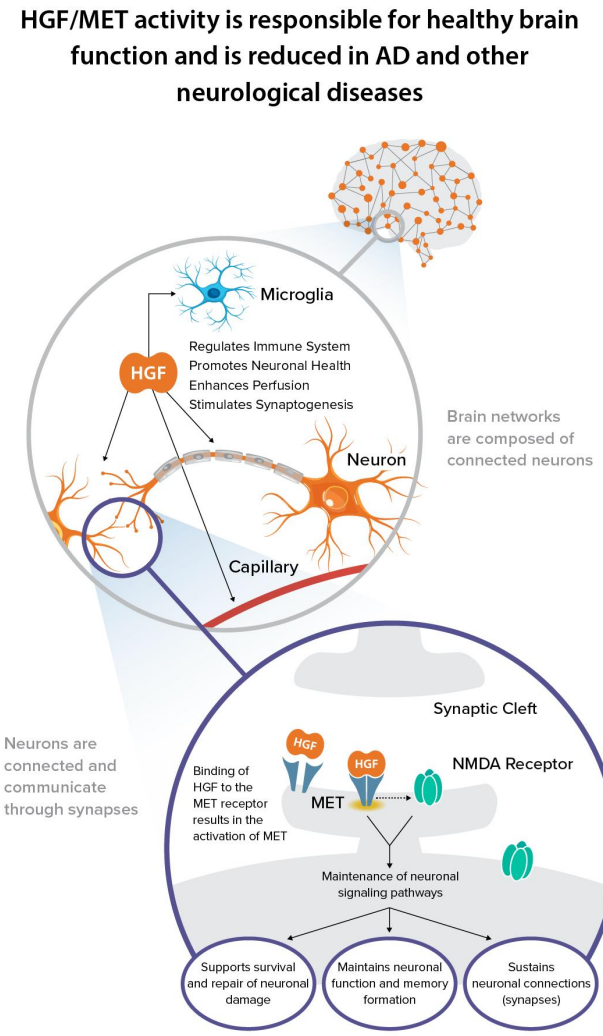
There is a vast unmet need for effective pharmacological treatment for AD. Despite significant investments in drug discovery programs and strategies to treat AD, there have been no approved therapeutics developed that can boost cognition, alter the course of the disease, and provide long-term symptomatic improvement. There are currently four marketed drugs for the management of AD symptoms: donepezil, galantamine, and rivastigmine (all acting on cholinergic neurotransmission) and memantine (targeting the NMDA receptor and glutamatergic neurotransmission/excitotoxicity). Beyond 6 to 12 months, the long-term efficacy for all of these drugs has not been proven; they can provide only temporary and modest clinical improvement.

Additionally, Aduhelm, which recently received accelerated approval due to effects on a biomarker directed to clear amyloid beta, or Aβ, may have potential as a disease-modifying therapy, though impact on clinical efficacy has yet to be firmly established. Several other experimental therapeutic agents directed towards Aβ clearance, and inhibition of Tau protein aggregation or phosphorylated-Tau, or pTau, clearance for AD, are in various stages of clinical development. Though Aduhelm has been approved by the FDA, its early adoption has been limited. And with several other clinical failures involving Aβ clearance, this highlights the incomplete understanding of the pathological processes in AD and clearly demonstrate the need for novel strategies to fight the disease effectively.

The HGF/MET Pathway – A Crucial System for Regeneration

The HGF/MET system has diverse roles relevant for synaptic function, network recovery, survival, and regeneration. We believe activation of HGF/MET offers a unique opportunity to address many aspects of AD pathology through a single, highly specific, targeted approach. Promoting the HGF/MET system has been shown to have multiple downstream beneficial effects relevant to improving symptoms and reversing the neurodegenerative process, making it an ideal target for complex neurodegenerative diseases, as illustrated below in Figure 2.

Figure 2. Normal HGF/MET System and Pathway. HGF is a protein ligand that binds to MET, which is a receptor expressed on the surface of neurons, glia, and vascular cells in the brain. HGF binding converts MET to an active state and initiates processes including changes in gene expression that help maintain normal cellular health and function. In the brain, the HGF/MET system contributes to neuronal signaling and healthy function including regulating N-methyl-D-aspartate, or NMDA, receptor activity, modulating glial activity to regulate inflammation, and helping maintain cerebral blood flow. These multiple downstream effects of the HGF/MET system play critical roles in maintaining healthy connectivity and brain function.



Significant Scientific Data Support HGF/MET's Role in Maintaining Neuronal Health and Function

Normal MET expression is crucial in homeostasis of the healthy adult brain. Multiple studies have demonstrated that the MET system is strictly regulated to have a stable expression pattern. MET is one of

a small number of uniquely regulated genes with very high differential stability in its quantitative pattern of mRNA gene transcript levels across hundreds of structures throughout the healthy adult brain. In fact, compared to approximately 17,000 other human genes, the MET receptor has the most differentially stable expression pattern in the cortex of the normal adult human brain. The cortex is a brain region that has important roles in learning, memory, and executive functioning, and this stable expression pattern demonstrates that the MET receptor is an important signature of a healthy brain.

Additionally, although MET expression is very stable in healthy adults, expression is reduced in AD subjects, particularly in the hippocampus. Previous studies have shown that AD subjects have a significantly reduced MET expression in different brain regions compared to healthy age-matched adults. This reduction highlights another rationale to rescue the activity of this critical regenerative system. Amplification of the HGF/MET system has the potential to provide critical neuroprotective and neuroregenerative effects to rescue damaged and dysfunctional neurons and promote recovery of cognitive functions.

Multiple third-party studies have documented the regenerative impact of HGF/MET promotion in models of AD, PDD, MS, and ALS, with examples shown in Figure 3 below. Notably, promotion of the HGF/MET system improved memory in AD and PDD models and improvement in neuronal survival was reported in various disease models including MS and ALS. These studies indicate that an enhanced HGF/MET system has substantial beneficial effects and support the HGF/MET system as a therapeutic target in a diverse array of neurological disorders.

Figure 3. Effects of HGF Treatment in Animal Models of CNS Disorders. Below is a list of preclinical studies conducted by third parties that show the beneficial effects of HGF/MET on functional endpoints or processes that are critical in recovering neuronal health and function. These studies demonstrate that boosting the activity of the HGF/MET system, whether through direct injection of HGF or increasing expression of HGF by gene therapy techniques, promotes neuronal health and regeneration, and rescues memory and function in several animal models of CNS disorders.

Disease	Animal model (species)	HGF Delivery Method	Outcomes	Reference
AD	Aβ-injection (mouse)	HGF gene therapy	Improvement in memory, increased cerebral blood flow, increased BDNF expression	Takeuchi et. al. 2008
Parkinson's	6-OHDA (rat)	HGF gene therapy	Improved survival of dopaminergic neurons, improved motor function	Koike et. al. 2006
Brain ischemia	Transient ischemia (gerbil)	Injection of HGF protein	Improved neuronal survival	Miyazawa et. al. 2007
ALS	SOD1-G93) (mouse)	HGF gene therapy	Improved survival of motor neurons, prolonged lifespan	Sun et. al. 2002
Cerebral infarction	Embolism (rat)	Injection of HGF protein	Improvement in learning and memory, improved neuronal survival	Date et. al. 2004
Spinal cord injury	Trauma (rat)	HGF gene therapy	Promoted neuron survival and axonal regrowth, improved functional recovery	Kitamura et. al. 2007
MS	EAE (mouse)	Injection of HGF protein	Promoted remyelination of damaged axons, improved clinical scoring	Bai et al., 2012
Peripheral neuropathy	Nerve crush (mouse)	HGF gene therapy	Promoted regeneration of nerve tissue by recruitment of Schwann cells and remyelination	Ko et al., 2018

6-OHDA: 6-hydroxydopamine; BDNF: brain-derived neurotrophic factor; EAE: experimental autoimmune encephalomyelitis

As demonstrated by these studies, HGF/MET has long been known as a promising therapeutic target for CNS disorders, but the delivery of large proteins or gene therapy to the CNS to augment HGF/MET has been problematic and fraught with challenges. These approaches are not BBB-penetrating and require invasive methods to deliver to the CNS, which increases the risk of an immune reaction or infection. Further, they are also expensive and more challenging to scale which could limit their availability to patients.

Challenges with Approved and Traditional Neuronal and AD Therapy Approaches

The development of neuronal therapies presents unique challenges including: an imperfect understanding of the biology, the presence of the BBB that restricts the flow of drugs to the brain, and a lack of translatability of preclinical study results in human trials. Currently approved therapies have limited efficacy, often poor side effect profiles, and transient impact on quality of life if any. There remains an urgent need for new and novel approaches to address most neurodegenerative disorders including progressive and severe conditions such as AD, PDD, MS, and others.

Specific to AD, each of the currently approved symptomatic therapies only targets a single neurotransmitter, with limited and transient effects on cognition and low tolerability, which negatively impacts compliance and minimally reduces the caregiver burden. Other therapies in development that target a slowdown in disease progression so far showed only a marginal benefit on clinical decline and are mainly focused on the pre-dementia stages, i.e. amnestic mild cognitive impairment, or aMCI, to early-mild AD. All lack any immediate benefit in reducing the burden on patients and caregivers impacted by the disease. After targeting toxic proteins, these approaches may rely on the body's repair mechanisms, which may also be damaged, and do not promote additional activation of regenerative pathways. This can add to variability of treatment outcomes and necessitates longer clinical development timelines. Further complicating drug development in AD has been the lack of utilization of biomarkers and measures that are able to detect early signs of efficacy and uncover promising candidates to take forward into larger trials. Biomarkers have revolutionized clinical research in oncology and other therapeutic areas, but traditionally not in AD. Historically, AD testing in clinical trials has relied heavily on imaging techniques to assess changes in amyloid and tau PET scans over several years, creating enormous costs and elongated timelines for the development process while not showing any direct correlation to cognitive functional improvement. We believe that these traditional methods can be replaced or supplemented by the use of rapid, non-invasive markers of brain activity and cognitive processing, like qEEG and ERP.

Our Differentiated Approach

We believe our ATH platform of small molecules will promote neuronal health and function through stimulating the HGF/MET system. Our small molecules are BBB-penetrating, can be delivered non-invasively, have very low risk of an immune reaction and are more cost efficient to manufacture and distribute. Boosting the HGF/MET system leads to the following primary downstream effects:

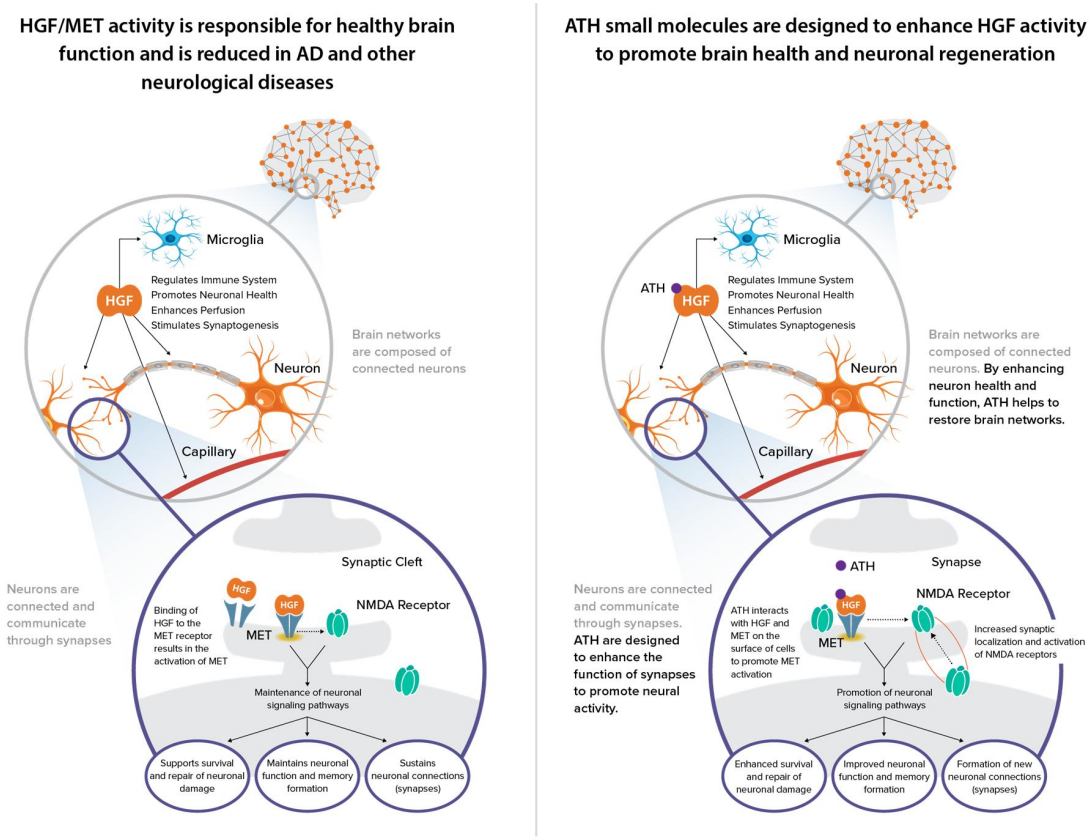
- *Synaptogenesis* as the core need of disrupted neuronal networks, overcoming the disconnection syndrome common to many neurodegenerative diseases.
- *Modulation of NMDA neurotransmitter system by enhancing synaptic localization and signaling*, leading to a rapid increase in brain network function. The NMDA receptor plays a key role in memory and learning. Other approaches work directly on the NMDA receptors and lack the specificity to modulate the NMDA receptor to the synaptic cleft, which is required to increase transmission of brain signals.
- *Restoration of traditional neuronal growth factor pathways* that are critical to neuronal survival, and activate brain systems that reduce oxidative stress, which is expected to reduce damage, slow down disease progression and improve network activity. Many therapies in development are focused only on slowing disease progression.

- *Improvement in cerebral blood flow, as well as reducing inflammation* by modulating inflammatory cytokine expression from the glia. Many other therapies only have a single mode of activity.

It is our goal to establish in current and future clinical trials that our ATH platform can positively impact neuronal health and function, not only by slowing down disease progression but also by improving brain network activity and function. We believe these effects could position Athira, and initially fosgonimeton, to address the complex pathology in neurodegenerative diseases.

We have designed fosgonimeton to specifically enhance the ability of HGF to activate MET. This substantially increases MET activation levels, and amplifies the beneficial effects downstream of the HGF/MET system.

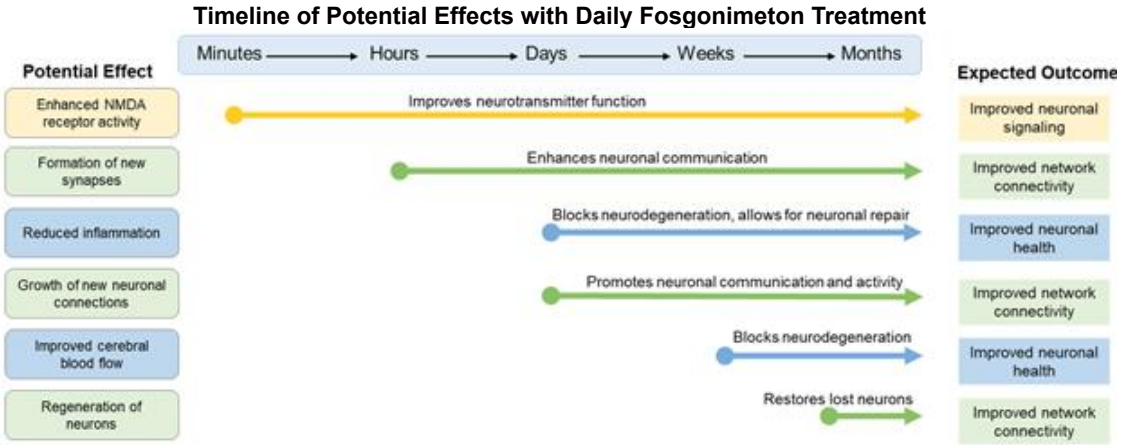
Figure 4. Our ATH Small Molecule Candidates Are Designed to Enhance the HGF/MET System and Promote Multiple Beneficial Effects with the Potential to Improve Connectivity and Brain Function in Neurodegenerative Diseases.



By promoting endogenous pro-survival and regenerative mechanisms orchestrated by HGF/MET signaling, our ATH platform is designed to be a novel path to treat AD and neurodegeneration using a systemic approach. Enhancing the HGF/MET system also captures the modulation of the NMDA neurotransmitter pathway in a way distinct from the only FDA approved NMDA modulator, memantine. Modulation of neurotransmitter systems serves as the basis for the four currently approved AD drugs.

However, unlike these currently approved AD drugs, fosgonimeton is designed to also activate regenerative and anti-inflammatory pathways. Figure 5 below illustrates the typical timing of the different beneficial effects as an outcome of activating the HGF/MET system, as derived from experimental results.

Figure 5. Our ATH Candidates Are Designed to Positively Modulate the HGF/MET System Which May Lead to Both Rapid and Long-term Beneficial Effects. We believe that following administration of fosgonimeton, the HGF/MET system will activate and lead to several downstream effects. We anticipate that these effects may rapidly boost cognition with multiple regenerative mechanisms and lead to a stable and sustained recovery of the brain network and function.



For therapeutic applications in CNS disorders, particularly AD, treatments that target neuronal growth factors can potentially accomplish several therapeutic goals including rapid cognitive improvement and sustained neuroprotective effects.

Our Use of Highly Translatable and Predictive Measures to Guide Clinical Development

We believe qEEG and ERP have the potential to revolutionize the development paradigm in AD clinical trials. Quantitative EEG and ERP methods are highly translatable, quantitative, and predictive measures that can guide clinical dose decisions and provide live measures which were shown to correlate to potential clinical benefit. These methods focus on electrophysiological changes known to occur in cognitive processing and function, can result in more efficient and cost-effective clinical trials, and potentially provide an accelerated development path compared to traditional AD drug development programs.

Quantitative EEG and ERP Methods Reflect Brain Activity and Function

Our focused drug development approach aims to understand the potential clinical benefit of a product candidate at the early stages of clinical development by utilizing qEEG and ERP methods. Certain EEG/ERP components are valuable measures of cognition, such as quantitative EEG, or qEEG, an assessment of high frequency gamma power brain waves, and the P300 latency component of ERP.

Commonly used in clinical research and clinical practice, qEEG and ERP methods provide valuable insight into cognitive function but have been largely overlooked in AD clinical trials. At Athira, we are innovatively using these non-invasive methods to gain early insight into potential therapeutic effects. Improvement in the brain network, as well as changes in neurotransmitter activity, can be captured in the electrical activity of the brain. These methods assess the brain's electrical activity from electrodes on the scalp. This non-invasive look at live brain activity is highly informative and can give insight into the brain penetration and neuroactivity of therapeutics directed to the brain. Quantitative EEG is a method to measure

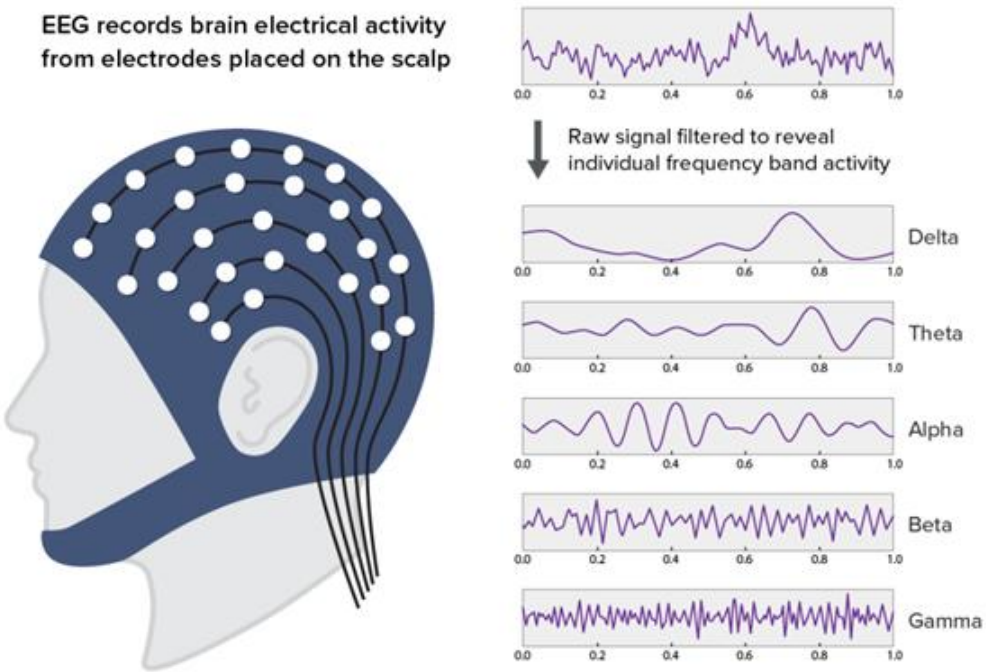
brain activity at rest, while ERP is measured from the same (or certain key) electrodes but only arises in response to a task-related stimulus. Quantitative EEG/ERP methods can provide substantial insight into the overall brain health and connectivity, as these measures are significantly altered in disorders that lead to cognitive impairment, such as AD.

For fosgonimeton, we incorporated a variety of translatable tools and measures into our clinical development plan. These measures, including both qEEG and P300 latency, have guided dose selection and provided predictive measures of cognitive improvement.

Quantitative Electroencephalogram: qEEG

EEG is a way to measure the electrical activity of the brain using small electrodes placed on the scalp. Neurons communicate and perform all functions using electrical impulses. EEG captures this electrical activity through the scalp and displays these electrical impulses as waves, as illustrated in Figure 6 below. The electrical activity will present at different frequencies or waves which provide various insights into neuronal health. We are most focused on the faster, higher frequency gamma waves which are associated with learning, memory formation and higher cognitive functions. Quantitative EEG is a method to quantitatively determine the amount of electrical signal that resides in each waveform, often described as power.

Figure 6. Noninvasive qEEG Recordings Reflect Brain Activity and Function.



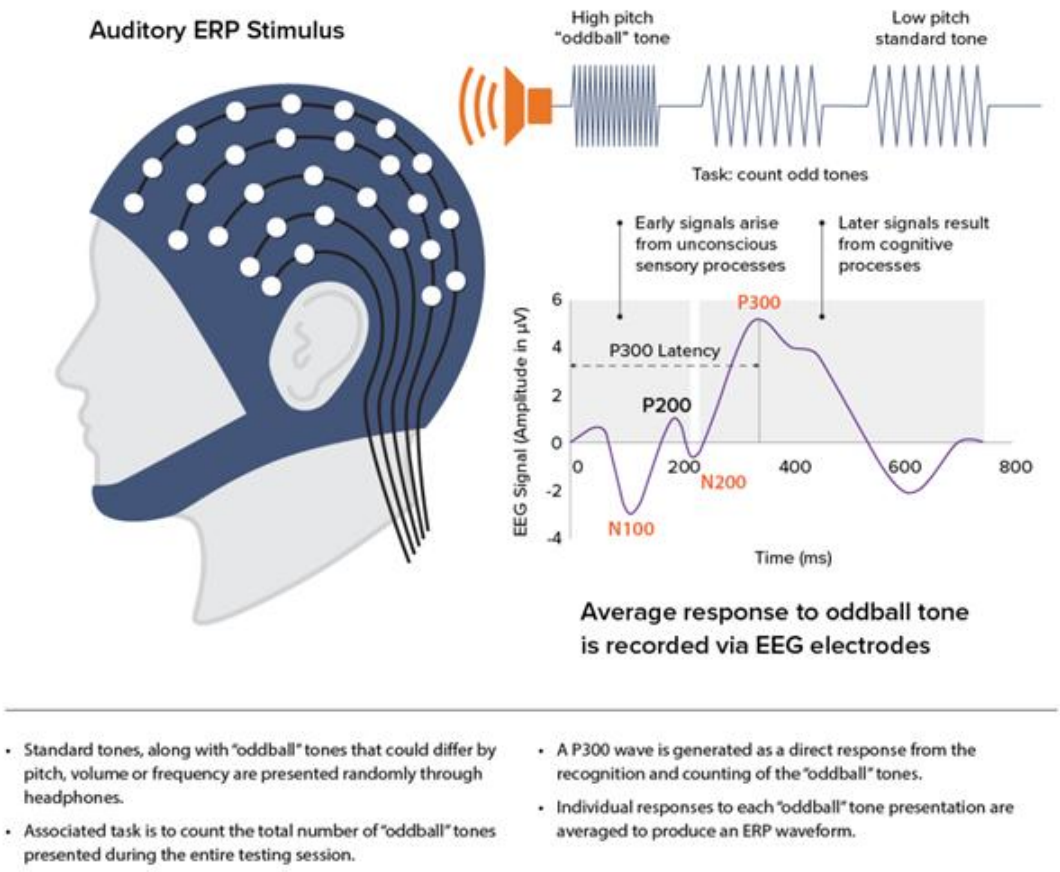
Changes in qEEG power or shifts in the amount of activity in each waveform can be caused by several factors including response to stimulus, cognitive state (healthy or dementia), and CNS-directed therapies. Because qEEG is a non-invasive direct measure of brain activity, it represents a valuable tool for

investigating therapies in AD and broader dementia. Changes in qEEG signals following administration of therapies targeting the brain indicate the therapy has reached the brain and likely engaged the intended target. Additionally, AD subjects present a general slowing of qEEG, where activity in higher frequency waves, such as gamma, is reduced. If therapies can reverse this pattern in AD, and increase gamma power, this may suggest treatment has helped improve brain activity. We utilized qEEG in our fosgonimeton Phase 1 clinical trial in healthy young, healthy elderly, and AD subjects as an indicator of CNS penetration and target engagement.

Event-related Potential: P300

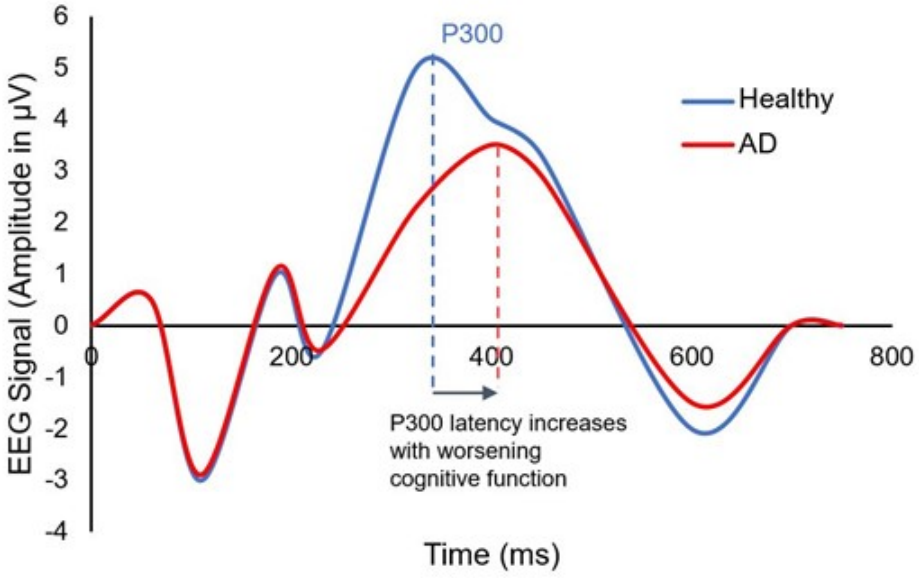
ERP refers to changes in the electrical activity of the brain in response to external stimuli. Recording brain activity while a subject is presented with a task reveals neural activity related to cognitive processing. Presenting subjects with a stimulus associated with a task, such as counting specific tones within a sequence, induces a series of electrical peaks that represent cognitive processing and memory access. P300 is the peak positive signal which is reported to typically arise 300 milliseconds after a tone stimulus and is the most studied component of the ERP waveform.

Figure 7. ERP Recording with an Auditory Oddball Paradigm.



The latency, or the amount of time that it takes to reach the peak of the positive wave following the stimulus, is typically reported to be 300 milliseconds in healthy, young, cognitively normal individuals. Numerous studies have shown that P300 latency is strongly correlated with cognition. P300 latency is increased and continues to worsen as AD and cognitive decline progresses. As an example, P300 latency is expected to be markedly increased in subjects with severe AD, compared to subjects with mild AD. The connection between P300 latency and increased cognitive decline has been characterized in a number of diseases including AD, PDD, DLB, Huntington's, major depressive disorder with cognitive impairment, and traumatic brain injury. Loss of synaptic connections and neuronal dysfunction are well characterized in AD, and likely are the primary causes of the increased P300 latency. Figure 8 below illustrates the latency of cognitive processing as demonstrated by the delayed peaks in P300 in AD subjects compared to healthy, age-matched subjects. While the P300 amplitude is often reported as lower in AD subjects compared to healthy, age-matched subjects, this measure is much less consistent and not as strongly correlated to cognition as latency.

Figure 8. ERP Waveforms in AD Subjects Show Increased P300 Latency.



Insights from Approved Therapies

Companies with approved therapies have demonstrated parallel improvement in P300 latency and cognition as assessed by the Alzheimer's Disease Assessment Scale-Cognitive Subscale, or ADAS-Cog, as shown in Figure 9 below. ADAS-Cog is a neuropsychological assessment used to assess the severity of cognitive symptoms of dementia. While these changes induced by acetylcholinesterase inhibitors are modest and often transient, these previously published results support the correlation of P300 latency and cognition in AD subjects. The magnitude of effects in P300 latency measures for current AD treatments is shown in Figure 9 below. The studies of donepezil and rivastigmine were conducted in patient populations at similar stages of disease (mild to moderate AD with an average P300 latency of 382.7 ms for the donepezil group and 382.3 ms for the rivastigmine group). The P300 methodology used was similar to that of our fosgonimeton Phase 1 study. Both drugs showed a modest improvement in P300 latency, with donepezil demonstrating a peak improvement of 16 ms and rivastigmine demonstrating a peak improvement of 22 ms.

Figure 9. Changes in P300 Latency Correlate with Cognitive Outcomes with Treatment of Approved Therapies in AD Subjects.

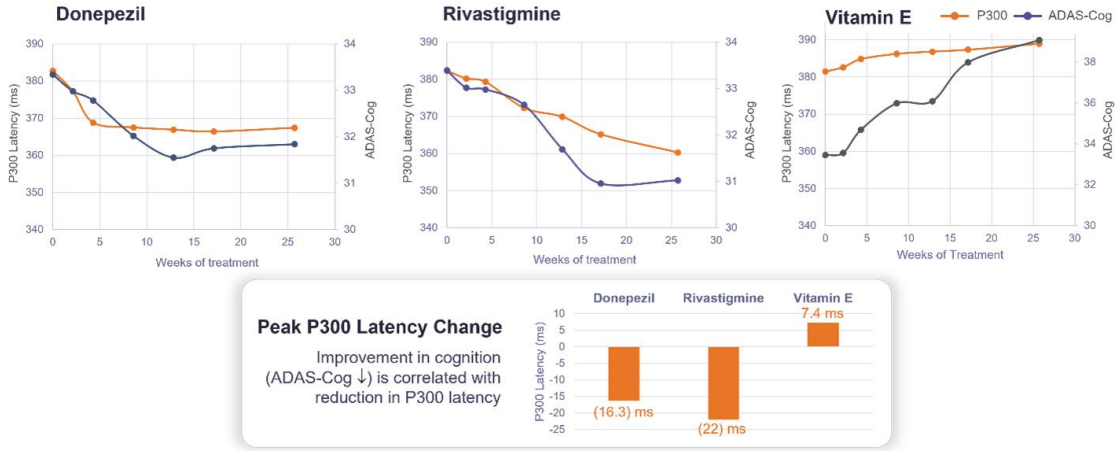


Figure 10, below, summarizes the correlation between P300 latency and changes in cognition in studies involving approved therapies.

Figure 10. Studies Suggest Changes in P300 Latency Have Been Predictive of Changes in Cognition.

Treatment	P300 Latency Effect	Change in P300 Latency	Population	Cognitive Effect	Summary
Donepezil	Improved	(16) ms	AD	Improved	P300 latency and cognition both improved in mild-to-moderate AD, though improvements were modest.
Rivastigmine	Improved	(22) ms	AD	Improved	P300 latency and cognition both improved in mild-to-moderate AD, though improvements were modest.
Memantine	Improved	(15) ms	AD	Improved	P300 latency and cognition both improved in moderate to severe AD, though improvements were modest.
Scopolamine	Worsened	50 ms	Healthy	Worsened	Scopolamine offers a counter example; P300 latency increases while cognitive performance is reduced.

Source: Results for donepezil and rivastigmine adapted from Thomas et al., 2001; results for memantine adapted from Sallach et al., 2011, and results for scopolamine adapted from Potter et al., 2000.

Applications to Our ATH Platform

In CNS disorders, fluid or imaging biomarkers have been extensively used in drug development. However, these can be invasive and expensive, and inconclusive in determining the connection of these biomarkers to cognition. We sought to develop a translational strategy for ATH that was highly correlated to brain function and cognition which led us to use qEEG/ERP for the clinical development of fosgonimeton. We believe these measures are particularly well-suited to provide early insight into drug effects in AD, given that as the cognitive decline progresses, subjects display a decrease in qEEG gamma power, and a progressive increase in ERP P300 latency.

Utilizing qEEG/ERP as non-invasive, translatable, and quantitative measures early in clinical development helps to inform future clinical trial designs. Positive changes in qEEG and ERP P300 latency

potentially indicate a positive cognitive effect of our ATH treatments, which increases our confidence that these effects may translate to clinical benefit in later-stage clinical trials.

Fosgonimeton for the Potential Treatment of AD and Other Neuronal Diseases

We are developing our lead product candidate, fosgonimeton, for the treatment of neurodegenerative disorders, with an initial focus on AD. Fosgonimeton is designed to improve neuronal health and promote regeneration, thereby improving symptoms in cognitively impaired subjects. As we continue to develop fosgonimeton, we will plan to assess additional functional and behavioral benefits. In our Phase 1a/b clinical trial, fosgonimeton for the treatment of AD was well tolerated with no serious adverse events across 88 subjects recruited in the study, including 11 subjects with mild-to-moderate AD, who were assigned to treatment and control groups. Additionally, fosgonimeton treatment led to improvements in brain network activity that indicated potentially positive effects on brain function. In the AD subjects, multiple dosing of fosgonimeton significantly improved P300 latency. P300 latency is a functional measure that is highly correlated with cognition; however, we have not yet established a connection between these P300 latency results and improved cognition. It is our goal to establish in current and future clinical trials that administration of fosgonimeton is effective in promoting cognitive improvement. In September 2020, we began site initiation and patient screening for LIFT-AD, our Phase 2/3 clinical trial with fosgonimeton designed with the potential to provide pivotal data in support of registration, for the treatment of mild-to-moderate AD, with topline results expected in the first half of 2023. In November 2020, we also initiated ACT-AD, a proof-of-concept Phase 2 clinical trial with ERP P300 latency as the primary endpoint, in mild-to-moderate AD, which trial is designed to better characterize the overall effects of fosgonimeton on working memory processing speed and cognitive capacity, with topline results expected in the second quarter of 2022. In July 2021, we announced that we are enrolling patients into a 26-week open-label extension study for our LIFT-AD and ACT-AD clinical trials, which will allow us to collect up to a total of one year of safety data with fosgonimeton. In October 2021, we announced that we completed patient enrollment in our ACT-AD clinical trial. In January 2022, we increased the LIFT-AD study sample size by approximately 120 participants, from 300 to 420, in order to strengthen the statistical power of co-key secondary endpoints, including ADAS-Cog11.

Mechanism of Action

Growing evidence suggests that complex CNS disorders, such as AD, are unlikely to be caused by a single route of pathology. Modulation of a neuronal growth factor has gained considerable attention for the potential treatment of neurodegenerative disorders. Our lead candidate, fosgonimeton, is a small molecule pro-drug therapeutic specifically designed to promote the ability of HGF to activate MET. This promotion substantially increases MET activation levels and amplifies the beneficial downstream effects of the HGF/MET system, with several attributes relevant to AD:

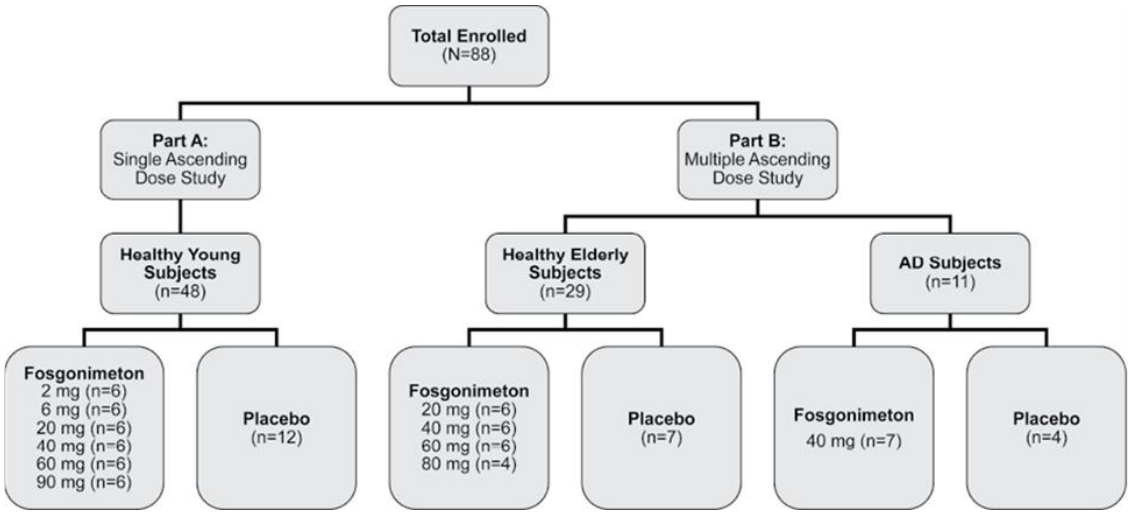
- HGF/MET is a critical neurotrophic factor for normative brain function and it is reduced in AD subjects;
- promotion of the HGF/MET system has shown in several animal models the potential to directly halt neurodegeneration and induce regeneration, improve cerebral blood flow, and reduce inflammation; and
- we expect HGF/MET system activation to improve P300 latency, as observed in AD subjects after fosgonimeton treatment in our Phase 1a/b clinical trial.

Clinical Results

Phase 1 Clinical Trial

The IND for fosgonimeton in AD was filed in September 2017. Since then, we have completed our Phase 1 clinical trial, which enrolled a total of 88 subjects, including 48 healthy young male subjects (mean age = 33.4 ± 6.3), 29 healthy elderly subjects (mean age = 63.8 ± 4.0; 14 male, 15 female), and 11 AD subjects (mean age = 69.2 ± 7.1; 5 male, 6 female, median [range] MMSE = 20 [5–29]), as illustrated below in Figure 11. The clinical trial was randomized and double-blind and consisted of daily single injections over a nine-day period. While the primary endpoints of our Part A single ascending dose, or SAD, and Part B multiple ascending dose, or MAD, trial were focused on safety and assessment of human pharmacokinetics, we also included qEEG and ERP as measures to evaluate effects of fosgonimeton on brain activity in AD subjects. Together, these clinical trials assessed qEEG as a measure of brain circuitry and network activity and ERP as a measure of working memory access and cognitive processes in the brain.

Figure 11. 88 Subjects Included in the Phase 1 Clinical Trial.



Fosgonimeton was shown to be well-tolerated across all doses tested. There were no serious adverse events (AEs), or clinically relevant findings reported in blood chemistry, urinalysis, vital signs, ECG, EEG, physical, or neurological examinations. A maximum tolerated dose was not achieved. Fosgonimeton demonstrated a pulsatile mode of target activation, and the PK profile is compelling, with linear dose relationship, no accumulation, and no sex or age effect. We did not have any subject dropout due to serious adverse events during this clinical trial.

Translation of Fosgonimeton Changes in Brain Circuitry Activity

Quantitative EEG was used as a translational tool to recapitulate the changes in brain network activity from fosgonimeton that were observed in our preclinical models and to help guide dose selection for late-stage clinical development. We collected qEEG recordings from healthy young, healthy elderly, and AD subjects to determine qEEG changes after the administration of fosgonimeton.

The criteria for healthy young were male subjects who at the time of screening were between the ages of 18 and 45, met certain body mass index and weight standards, and who were determined at the investigators' discretion to be generally in good health as determined by medical history, vital signs, and physical and clinical examination. The criteria for healthy elderly were male and female subjects, who at the time of screening were between the ages of 60 and 85, met certain body mass index and weight

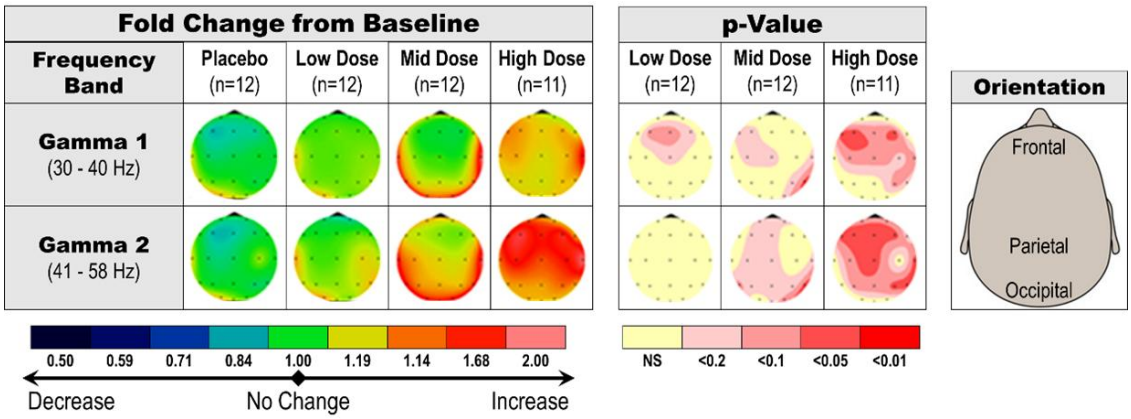
standards, and who were determined at the investigators' discretion to be generally in good health as determined by medical history, vital signs, and physical and clinical examination.

In the clinical trials, fosgonimeton increased the levels of the high frequency gamma power which is the frequency band that is associated with learning, memory, and cognitive function. Gamma is typically decreased in AD subjects. Fosgonimeton showed dose-dependent and consistent changes in gamma brain activity signals across all treated cohorts, consistent with the changes observed in non-clinical models.

Quantitative EEG Changes Observed in the Phase 1 Part A SAD Clinical Trial

Rapid induction in the high frequency gamma power was observed after a single dose and is most likely explained by fosgonimeton promoting HGF/MET induced synaptic relocation of NMDA receptors and potentiation of NMDA receptor currents. A dose-dependent increase was observed across the low, mid, and high doses with statistically significant changes at the highest dose levels assessed. Figure 12 below shows the change in qEEG gamma power from baseline following administration of placebo, low dose fosgonimeton (2 and 6 mg, pooled), mid dose (20 and 40 mg, pooled), and high dose (60 and 90 mg, pooled). The p-value maps show the statistics based on analysis of covariance, or ANCOVA, analysis. There were 12 subjects for each of the low- and mid-dose groups, and 11 subjects for the high-dose group. A single subject from the high-dose group in the single-dose data set in Figure 12 below was excluded from analysis due to an inability to capture or analyze data as a result of technical issues such as electrode placement or subject movement. All AD subjects' data were captured at all data points.

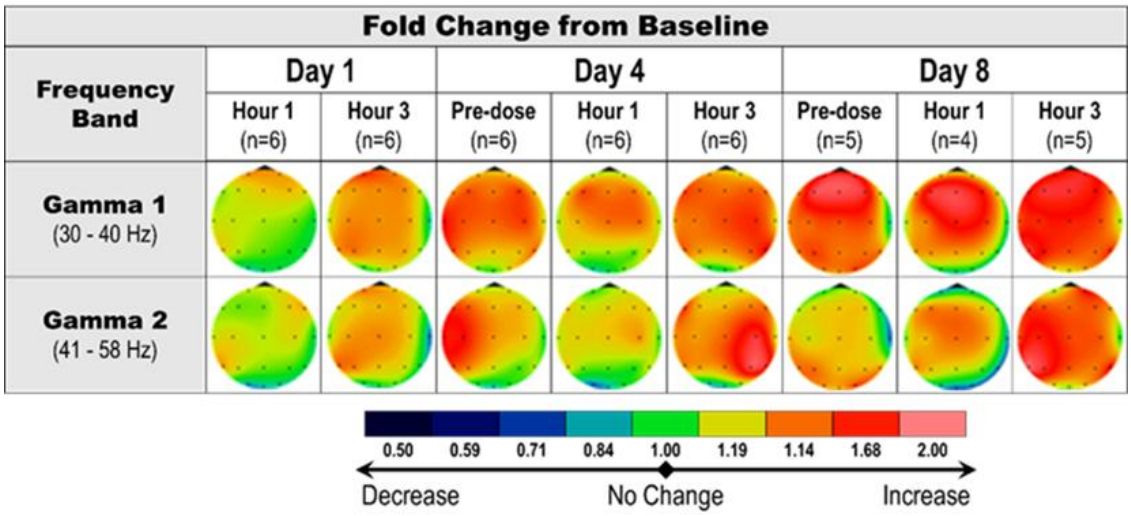
Figure 12. Single Dose of Fosgonimeton Increased qEEG Gamma Power in Humans.



Quantitative EEG Changes Observed in Phase 1 Part B MAD Clinical Trial in Healthy Elderly Subjects

The main qEEG effect of fosgonimeton administration at all doses (20, 40, and 60 mg) in the healthy elderly subjects was increased gamma power, both at 3 hours post-dose on Day 1 and across multiple data points collected on Days 4 and 8 for all assessed doses of fosgonimeton. Figure 13 below shows the change in gamma power with once-daily administration of the 20 mg dose of fosgonimeton over 9 days. Similar effects were observed at 40 mg and 60 mg doses of fosgonimeton; data for the 80 mg dose level were not analyzed due to technical issues during data collection and a smaller sample size. All subjects completed the planned administration and data collection schedule; however, data from two of the healthy elderly subjects on Day 8 was lost due to an inability to capture or analyze that data as a result of technical issues such as electrode placement or subject movement. All AD subjects' data were captured at all data points.

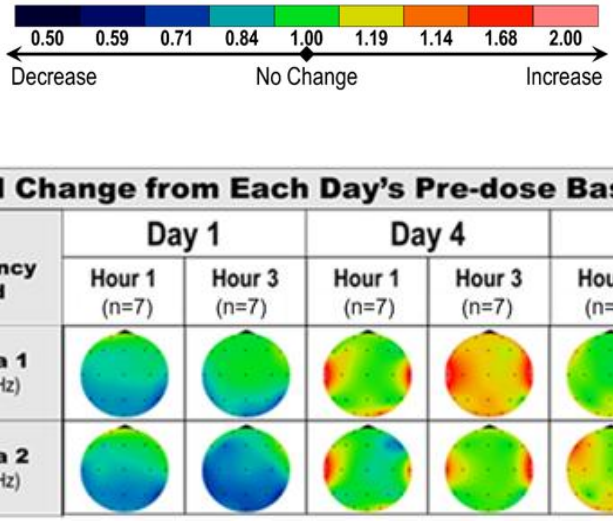
Figure 13. Fosgonimeton Administration Increased qEEG Gamma Power in Elderly Subjects.



We also observed increased gamma power on Days 4 and 8 at the pre-dose recording: 24 hours after the last dose of fosgonimeton, fosgonimeton was measured and shown to be completely cleared from the plasma. These results suggest that the beneficial effects of fosgonimeton are sustained. The increase in gamma power was specific to the treatment groups as no increase was observed in subjects receiving placebo.

The multiple dose clinical trial in AD subjects (40 mg subcutaneous injection once daily over 9 days) suggested a potential effect in AD subjects. Analysis of qEEG indicates an acute induction of gamma power (Day 4 and Day 8) after multiple doses. Figure 14 below shows emerging recovery of acute gamma power induction after 4 days of fosgonimeton treatment which continues to increase after 8 days of treatment. This pattern was not observed in subjects receiving placebo, where there was no consistent change in acute gamma power induction.

Figure 14. Fosgonimeton Administration Rescued Acute Gamma Power Signal in AD Subjects.



Overall, the qEEG results in humans are indicative of CNS penetration and target engagement, suggesting an active dose range of fosgonimeton from 20 to 90 mg.

Event-related Potential

In our Phase 1 Part B clinical trial, ERP P300 recordings were collected from the MAD healthy elderly and AD subjects. Analysis of these P300 data demonstrated that one daily dose of fosgonimeton improved P300 latency over an 8-day dosing period in AD subjects, as shown in Figures 15–17. P300 latency, a functional measure of working memory processing speed and executive function that highly correlates with cognition, was dramatically improved; however, we have not yet established a connection between these P300 latency results and improved cognition. After a single dose of fosgonimeton, all AD subjects tested had improved P300 latency, and by the end of a 9-day treatment cycle, average P300 latency across the AD treatment group had improved by 73 milliseconds, as measured on day 8, a statistically significant change compared to placebo group that did not show any significant directional change. We also observed sustained effects on P300 latency in the pre-dose recordings on subsequent testing days (the arrows in Figure 15 show the average P300 latency value from the fosgonimeton group as a heat map). At these time points, which are 24 hours after the last dose, fosgonimeton was measured and shown to be completely cleared from the plasma, while recorded P300 latency values remained lower than baseline. These data indicate fosgonimeton treatment potentially recovered disruptions to brain function and network connectivity, which we believe are likely through several components of the mechanism, including NMDA receptor modulation, increased connectivity through recovery of synaptic density, and improved overall neuronal health and function.

Figure 15. Fosgonimeton Treatment Led to Continued and Sustained Improvement in P300 Latency in AD Subjects. The arrows highlight the sustained P300 latency benefit due to fosgonimeton treatment.

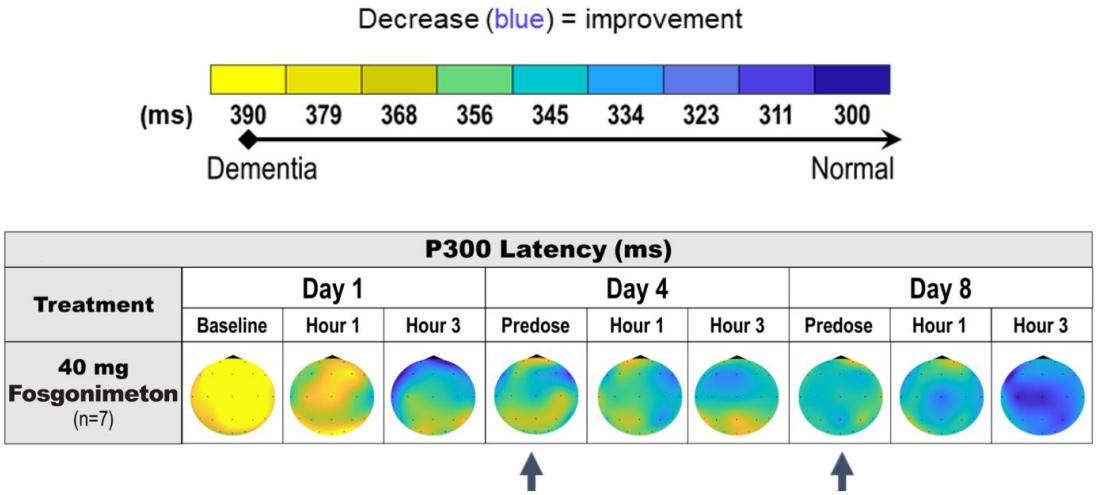


Figure 16. Quantification of the Change in P300 Latency from Baseline, Fosgonimeton Significantly Reduced P300 Latency Compared to the Placebo Group on Day 8 Recordings. Data show average P300 latency values of 7 AD subjects treated with fosgonimeton vs. 4 AD subjects on placebo * p=0.027

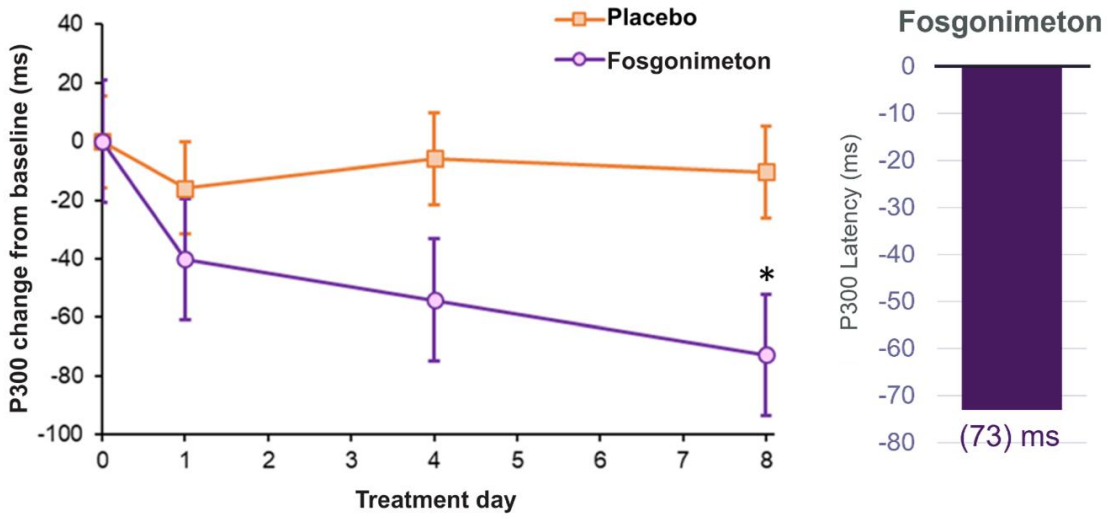
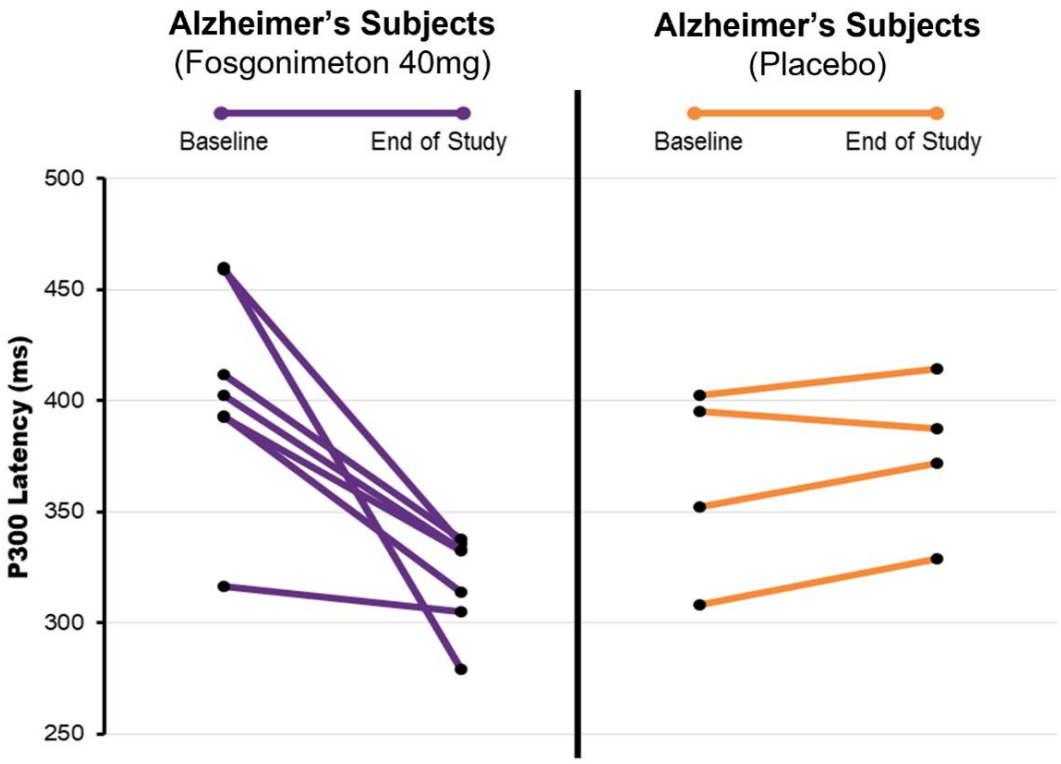


Figure 17. Data from Each Subject in the Clinical Trial Showing the Change in P300 Latency from Baseline. Every Subject Receiving Fosgonimeton Showed a Level of Improvement in P300 Latency and Subjects Receiving Placebo Had No Consistent Change.



Safety

Fosgonimeton, administered once daily by subcutaneous injection, was well tolerated with no serious adverse events in our placebo-controlled double blind Phase 1 clinical trial completed to date, where we enrolled 88 subjects recruited in the study, including 11 subjects with mild-to-moderate AD, who were randomized to treatment and control groups.

Additionally, three chronic GLP toxicology studies, a 6-month toxicity study in rats, a 6-month toxicity study in dogs, and a separate 9-month toxicity study in dogs showed no fosgonimeton-related clinical or veterinary observations or effects on quantitative ECG parameters (dogs) or clinical pathology parameters, macroscopic findings, or organ weight changes in both species. Daily subcutaneous administration of fosgonimeton to rats and dogs for 26 weeks and 39 weeks in dogs at dose levels of 2, 4, and 8mg/kg/day was tolerated. The only adverse finding was necrosis of the injection site subcutaneous tissue in male animals at 8mg/kg/day. The systemic NOAEL was the high dose at 8mg/kg/day, equivalent to a 290mg Human Equivalent Dose (based on ATH-1001 Cmax in rats). Moreover, GLP safety pharmacology studies on rats and dogs reported no fosgonimeton-related effects on cardiovascular, respiratory, or CNS function at the high dose of 8mg/kg/day. There were no indications of fosgonimeton-related mutagenicity or genotoxicity in in vitro genotoxicity assays or evidence of clastogenicity or aneugenicity in in vivo micronucleus assays.

In summary, human exposures from the planned dose range of 40-70 mg for the Phase 2 and 3 clinical trials are well below the animal no observable adverse event level, or NOAEL, exposures.

Furthermore, the NOAEL from the 26-week GLP toxicity study was defined by injection site reactions, which are monitorable and reversible, and may be less of a risk in humans due to greater surface area, a higher number of injection sites, and a lower volume of injection relative to body size.

Administration

Fosgonimeton is delivered by once-daily subcutaneous injection. The fosgonimeton formulation is non-viscous, near physiological pH, and is expected to be dispensed and administered at room temperature. These attributes and the use of small-gauge needles (29), and low volume (1 mL) significantly optimize the fosgonimeton product profile for a subcutaneous route of administration. Subcutaneous injections are a common route of administration of chronic therapies, including those for diabetic or MS patients, and are easy to administer for patients and/or caregivers while being generally well tolerated. With the progression of neurodegenerative disorders, oral administration can become challenging as:

- safe swallowing often becomes increasingly difficult;
- daily trays of multiple solid oral dosage forms add to patient/caregiver burden; and
- potential resistance to care can also impact compliance.

Subcutaneous injectables do not present as a potential barrier to adoption, and as the base-case target product profile, represents a significant opportunity. Following our initial medication management research initiative, where we surveyed a number of caregivers and medical professionals to understand compliance challenges in the AD population, an external market research firm independently assessed the adoption potential of fosgonimeton as a once-daily subcutaneous injectable across neurologists, patients/caregivers and subcutaneous injectables experts. Key findings are in line with prior research and continue to support this product profile (pre-filled syringe, subcutaneous injection) as a well-known route of administration among this patient population; and has the potential to overcome identified patient-related challenges, including forgetfulness and compliance, swallowing, agitation and behavior.

Development Strategy

Our development strategy is designed to support a rapid and risk mitigated approach to bring fosgonimeton to the market. While we believe the compound can improve cognition in all stages of AD, our initial focus is on the mild to moderate AD stage because this is the area of highest medical need while allowing for shorter pivotal trials and in following an established regulatory pathway.

LIFT-AD Trial: A 26-Week Phase 3 Clinical Trial in Mild-to-Moderate AD Subjects

Based on the safety and translational Phase 1a/b clinical trial results, including AD subjects, we are conducting LIFT-AD, a Phase 3 randomized, double-blind, placebo-controlled clinical trial. This clinical trial is designed to assess the efficacy, safety, and tolerability of two dose levels of fosgonimeton (40 mg and 70 mg) in subjects with mild-to-moderate AD compared to placebo over a 26-week period. The clinical trial is intended to enroll approximately 420 AD subjects. Subjects enrolled in the clinical trial will have a severity range within the conventional boundaries for mild-to-moderate AD, based on MMSE 14-24 inclusive. Clinical dementia rating, or CDR, is a 5-point scale used to assess cognitive processing and function in AD and related dementias. CDR 1 or 2 are an additional inclusion criterion to ensure overt dementia. In September 2020, we began the site initiation and patient screening for the LIFT-AD trial and anticipate topline results in the first half of 2023. While the results may qualify for pivotal data in support of registration, the FDA or other regulators might still require additional trials, even if results from the LIFT-AD trial are positive.

Compared to therapies focused on AD progression, which traditionally require multi-year clinical trials to measure changes in disease progression, we believe that fosgonimeton may induce a rapid boost in cognition, which enables us to design our trial with a 26-week treatment period and potentially accelerate the clinical development of fosgonimeton.

The primary endpoint in LIFT-AD is the Global Statistical Test, or GST, and this unbiased, unweighted composite single outcome will provide the assessment of proof-of-concept. The GST is a mathematical algorithm based on actual psychometric performance tests of ADAS-Cog11 and either ADCS-CGIC or ADCS-ADL23. The co-key secondary endpoints will potentially provide pivotal evidence to support registration. ADAS-Cog11 refers to the 11 tasks that make up the ADAS-Cog neuropsychological assessment. ADCS-CGIC refers to the Alzheimer's Disease Cooperative Study-Clinical Global Impression of Change, a systematic method to support clinical relevance of statistically significant benefits in cognitive performance testing. The GST composite provides a more sensitive endpoint to the overall treatment effect of multiple variables and increases our chances of understanding the full impact of fosgonimeton clinical outcomes. If co-key secondary endpoints – e.g., ADAS-Cog-11 and ADCS-CGIC – are only trending, then GST may still be statistically significant. Thus, positive GST data will support proof of concept, and positive results from the co-key secondary endpoints will potentially provide pivotal evidence to support regulatory approval.

Further secondary endpoints include the Controlled Oral Word Association Test, or COWAT, to specifically assess changes in executive memory function, the Alzheimer's Disease Cooperative Study – Activities of Daily Living, or ADCS-ADL23, scale to assess 23 instrumental activities of daily living, and the Neuropsychiatric Inventory, or NPI, to assess any changes in behavior.

Exploratory pharmaco-economic outcomes are comprised of validated scales to capture resource utilization (RUD-lite 3.3), caregiver burden (Zarit Burden Interview) and quality of life (EQ-5D-5L).

The clinical trial design for LIFT-AD was informed by our previous interactions and discussions with the FDA. In order to be considered a pivotal trial supportive of FDA approval for mild to moderate AD, LIFT-AD will need to achieve a statistically significant improvement separately on our co-key outcomes, e.g. the ADAS-Cog11, ADCS-CGIC, and ADCS-ADL23. In January 2022, we announced that we are increasing the LIFT-AD study sample size by approximately 120 participants, from 300 to 420, in order to strengthen the statistical power of these co-key secondary endpoints.

ACT-AD P300 Trial: A 26-Week Phase 2 Clinical Trial in Mild-to-Moderate AD Subjects

In addition to LIFT-AD, in November 2020 we initiated ACT-AD, a randomized, placebo-controlled P300 Phase 2 clinical trial designed to test the same dose levels of fosgonimeton (40 and 70 mg/d) in subjects with mild-to-moderate AD compared to placebo. We completed enrollment in October 2021 at 77 mild-to-moderate AD subjects using the same enrollment criteria as described above and include a 26-week treatment period.

The primary endpoint of ACT-AD is change in ERP P300 latency. Several secondary endpoints will be assessed, including ADAS-Cog11, ADCS-CGIC, and ADCS-ADL23. The ACT-AD trial was similarly designed to the potentially pivotal LIFT-AD trial; key findings from ACT-AD could function as an interim analysis for LIFT-AD without statistical penalty. Additionally, ACT-AD will continue to assess safety of fosgonimeton in mild-to-moderate AD during the 26-week trial period, with potential to add an additional up to 26-weeks of safety data in an optional open label extension study.

Open Label Extension of LIFT-AD and ACT-AD Clinical Trials

Following the completion of the 26-week treatment period during the LIFT-AD and ACT-AD trials, patients may elect to continue on an open label extension and receive treatment with fosgonimeton at the high dose (70mg/day) for up to an additional 26-weeks. The data collected from this open label extension may provide us with a better understanding of the long-term safety and efficacy profile of fosgonimeton. Additionally, we are currently considering further extending the open label extension of the LIFT-AD and ACT-AD trials.

Phase 2 Proof-of-Concept Clinical Trial in PDD and DLB Subjects

In addition to the three AD clinical trials, we are moving beyond AD and are also testing the effects of fosgonimeton in PDD and DLB subjects. After initial limitation to the nigrostriatal system neurons, PD is a condition that leads to a progressive damage of more neuronal networks over time, ultimately impacting function and cognition and resulting in dementia in the majority of subjects affected. Like AD, PDD subjects demonstrate an increase in their P300 latency, which increases the likelihood that fosgonimeton can potentially address dementia in PDD subjects. This clinical trial was called SHAPE and is a randomized, double-blind, placebo-controlled, parallel-group Phase 2 proof-of-concept clinical trial in PDD and DLB subjects. It was initiated at the end of 2021 and the first patient was dosed in January 2022. The population severity will include Hoehn-Yahr stages 1 through 4, inclusive, who will receive 40 mg and 70 mg once daily of fosgonimeton versus placebo. Endpoints will include ERP P300 latency, cognition, function, and behavior, and also motor function.

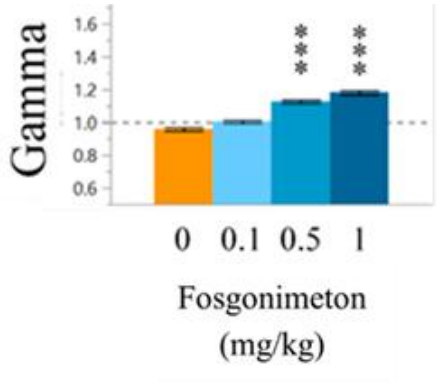
Preclinical Results

Fosgonimeton was assessed in multiple preclinical studies, including *in vitro* assays and several animal models of memory deficits. Fosgonimeton promoted the formation of new spines and functional synapses in hippocampal neurons *in vitro* (neuronal cultures). Fosgonimeton also activated HGF/MET, which in turn has been shown to enhance long-term potentiation. Long-term potentiation refers to a process at the individual neuron level, where memory formation is thought to involve a sustained increase in synaptic efficiency following repeated stimulation. In the aged animal model of dementia, fosgonimeton increased synaptic density and in multiple models of dementia improved performance in tests of spatial memory.

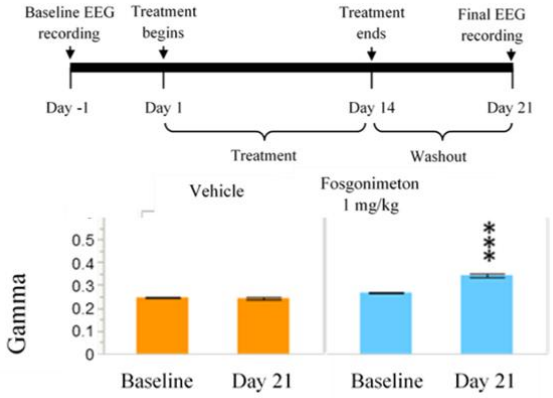
Similar to the clinical findings, fosgonimeton treatment also increased the qEEG gamma power that is associated with cognitive processing and memory in a non-clinical AD animal model (APP1/PS1), as shown in Figure 18. Changes in gamma brain activity signals are highly translatable which helped guide our selection of the clinical doses.

Figure 18. Fosgonimeton Treatment Induces Acute Increases in Gamma Power within One Hour of Administration (left) and Daily Treatment for Two Weeks Followed by a Seven-Day Washout Shows a Sustained Effect on Gamma Power (right).

Fosgonimeton Induces an Acute Dose-Dependent Increase in Relative Gamma Power



Two Weeks of Fosgonimeton Treatment Induced Increased Gamma Power That Was Sustained After Seven Days of Washout



***p<0.001

Our ATH Platform

Our ATH platform leverages the activity of a validated regenerative pathway, the HGF/MET system, that is critical for normal brain function. It is our goal to establish in current and future clinical trials that our ATH platform, which is designed to enhance the body's repair mechanism of HGF/MET, can potentially address a wide range of clinical applications ranging from CNS disorders, such as AD, PDD, MS, and ALS, to more peripheral conditions such as neuropathy. In addition, we believe that HGF/MET biology plays a role in neuropsychiatric indications such as depression and anxiety.

Key Aspects of Our ATH Platform

Our ATH platform utilizes proprietary technology to target and enhance the activity of a vital neuronal growth factor that promotes neuronal health and regeneration. We believe that our ATH platform has multiple advantages compared to previous strategies that have targeted growth factors, including:

- *Small molecules*. Previous attempts to promote neurotrophic factor activity with recombinant proteins or stem cells involved invasive surgeries or risked immune response. Our small molecules overcome these challenges, allowing for non-invasive systemic drug delivery through subcutaneous or oral routes that distribute to the nervous system.
- *Efficient and scalable manufacturing process*. Small molecules are manufactured using scalable chemical synthesis routes, representing a cost and time efficient process that does not require custom manufacturing infrastructure.
- *Avoids alteration of target system regulation*. ATH compounds are designed to enhance the activity of the target system with neither disruption to nor evasion of the normal regulatory processes that are in place to prevent hypo- or hyper-activation. This design aims to reduce safety risks.

We believe that the ATH platform represents a significant opportunity to develop therapeutics for the treatment of diseases of the nervous system and has the potential to drive significant advancement in regenerative medicine.

Our Therapeutic Discovery Process

We utilize a rigorous process to identify small-molecule compounds that activate regenerative systems.

- *Focus on activity*. Our drug screening process is an efficient blend of modern and traditional methods, starting with extensive modeling to create compound libraries. In our process, focus is placed on early activity assays, in which potential hits are advanced to further discovery.
- *Maximize hit potential*. When hits are identified, we employ a comprehensive set of studies to collect compound characteristics and optimize for drug-like characteristics with medicinal chemistry and structure-activity relationship studies to produce candidates ready for further development.
- *Gain insight to inform future therapeutic development*. We consider the drug discovery process as a cycle, with past work continuously informing future drug design, ultimately optimizing the process as we advance our knowledge and expertise.

This system has supported the identification of several candidates for development, including fosgonimeton. We are using our ATH platform and discovery engine to explore potential development of therapeutic candidates in additional nervous system disorders including ALS, MS, and neuropsychiatric indications, as well as in peripheral indications such as peripheral neuropathy. We are also actively exploring the potential of expanding the focus of our discovery engine to multiple molecular targets relevant to nervous system disorders.

Additional Development Opportunities

Our Neuropsychiatric Program (ATH-1020)

We are currently developing ATH-1020 for neuropsychiatric conditions. The HGF/MET system is relevant for multiple neuropsychiatric indications including depression, anxiety and schizophrenia, as well as the cognitive impairment regularly associated with these conditions. The lifetime prevalence of common mental disorders is reported to be almost 30% and, despite the sizable number of available treatments, a large portion of subjects show an unsatisfactory or a lack of response to treatment. This context, combined with slow responses to common treatments, results in a major burden for patients, public healthcare, and disability systems. ATH compounds represent a novel mechanism for the treatment of neuropsychiatric conditions.

Our product candidate for the neuropsychiatric program is ATH-1020. ATH-1020 is a new compound for which we recently filed an IND application with the FDA at the end of 2021, and received notice of acceptance in January 2022. We initiated the Phase 1 clinical trial for ATH-1020 in the first quarter of 2022, which is designed to evaluate the safety, tolerability, and pharmacokinetics of ATH-1020 in approximately 68 healthy young and elderly volunteers. ATH-1020 is a novel small molecule compound designed to be an orally available once-daily treatment, to enhance the HGF/MET system, and to distribute to the CNS. Preclinical testing has demonstrated neuroprotective effects leading to increased neuron viability in response to several neurotoxic insults. Additionally, treatment with ATH-1020 mitigated depression-related behaviors in an animal model of depression, as shown in Figure 19. In the MK-801 rodent model of schizophrenia, ATH-1020 rescued mismatch negativity response, a translatable electroencephalogram (EEG) measure that shows consistent and robust deficits in both rodent models and schizophrenia patients (Figure 20).

Figure 19. ATH-1020 Improve Depressive-like Behaviors in Rats in the Forced Swim Model of Depression. Data show average frequency of behaviors normalized to vehicle for ten rats per group. ATH-1020 significantly improved performance in the forced swim test, by reducing immobility, a depressive-like behavior, and increasing swimming, commonly interpreted as an antidepressant effect, compared to vehicle (*p<0.05, **p<0.01, ***p<0.001).

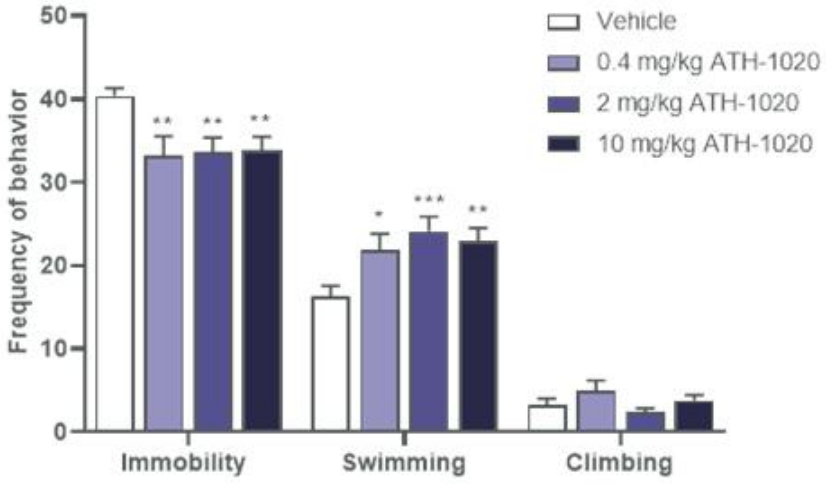
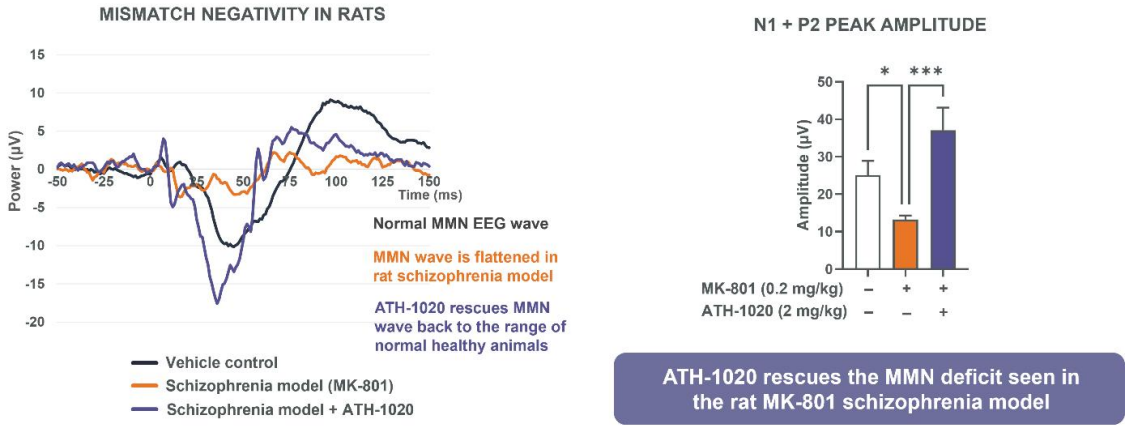


Figure 20. ATH-1020 Rescues the Mismatch Negativity (MMN) Deficit Seen in the Rat MK-801 Schizophrenia Model. Data show EEG recordings in vehicle control, MK-801 only, and MK-801 plus ATH-1020 treatment groups. ATH-1020 rescues MMN wave back to the range of normal healthy animals. (*p<0.05, ***p<0.001).



From several preclinical findings, we believe the stimulating activity of ATH compounds on the HGF/MET system is well-suited to address neuropsychiatric conditions because:

- HGF/MET signaling is deficient in neuropsychiatric patients and negatively correlated to disease severity;

- reductions in HGF/MET signaling is a causative agent of depression and anxiety behaviors in rodents;
- enhancement of HGF concentrations in the brain has anti-depressive and anxiolytic effects in rodent models; and
- in a rodent model of schizophrenia, enhancement of HGF/MET activity rescued MMN response (a translatable EEG measure from rodents to humans).

Further, patients suffering from major depression display reduced function and connectivity of neural pathways, resulting in prolonged P300 latency compared to healthy controls. This effect is particularly apparent in those experiencing cognitive dysfunction. The extent of P300 latency slowing is strongly correlated with the severity of depression, and a normalization of P300 latency is associated with response to treatment. A similar correlation is observed in patients suffering from other neuropsychiatric disorders. Our HGF positive modulator for the treatment of AD, fosgonimeton, reduced the P300 latency of AD subjects in a Phase 1b clinical trial within 8 days of treatment. While the patient populations in neuropsychiatric conditions and AD are substantially different, the root cause of the diseases may not be, and properties of P300 latency have been shown to be conserved across many diseases. These results highlight the ability of HGF/MET activators to impact P300 latency, which when combined with the preexisting research on the effects of activating the HGF/MET system in neuropsychiatric disorders indicates that treatment with HGF/MET activating compounds may be capable of improving patient outcomes in neuropsychiatric indications. We are advancing ATH-1020 for further development for neuropsychiatric indications and submitted our IND to the FDA at the end of 2021. Late-stage non-clinical development work and potentially early clinical studies will support decisions on selection of the product candidate and indication moving forward.

Our Peripheral Indication Program (ATH-1019)

We have initiated a discovery program to evaluate ATH compounds for peripheral nervous system disorders, such as neuropathy. ATH-1019 (formerly ATH-1018) is a novel, orally active candidate that has demonstrated ability to significantly promote the activity of the HGF/MET system. We are planning to administer ATH-1019 at doses that are expected to largely relegate its activity to the periphery. ATH-1019 potentially represents a new strategy to address peripheral nervous system disorders by promoting the regenerative power of the HGF/MET system with a small molecule therapy. Consideration of HGF/MET activators as a therapeutic approach for peripheral nervous system disorders including neuropathy was initiated following review of studies demonstrating that HGF/MET activating treatment repaired peripheral nerve injury and reduced neuropathy.

We believe the activity of ATH compounds, through enhancement of the HGF/MET system, is well-suited to address peripheral nervous system disorders including neuropathy given that HGF/MET signaling has been shown to:

- protect nerve cells from damage and death;
- promote regeneration of damaged peripheral nerves, mediated through Schwann cell activity;
- inhibit inflammation by reduction of the expression of pro-inflammatory cytokines; and
- down-regulate the expression of pain-related genes in damaged peripheral neurons, including ATF3.

Furthermore, previous clinical trials have shown that with HGF plasmid therapy, designed to increase circulating HGF, promoting the HGF/MET system significantly reduced pain in patients with diabetic peripheral neuropathy. We believe these clinical trials provide a proof of concept for the therapeutic target. However, our oral small-molecule candidates offer distinct advantages over plasmid therapies, including controlled dose and ease of administration. Targeting HGF/MET signaling for the treatment of peripheral nervous system disorders is supported by both preclinical and clinical research, and we are evaluating the

next generation oral ATH compounds for peripheral activity. We are advancing ATH-1019 to further discovery and development for peripheral nervous system indications.

Market Opportunity

AD and Dementia

Fosgonimeton is being advanced for mild-to-moderate AD patients initially. The AD dementia market today in 2022 is reported to be approximately 6.2 million Americans and is projected to reach nearly 14 million by 2050 in the U.S. alone. Worldwide, as many as 35 million people are estimated to have AD and the patient population was projected in 2007 to grow to over 100 million by 2050. Our strategy is to ultimately position fosgonimeton as a treatment for dementia broadly. Spanning all dementias globally, an estimated 55 million people are reported to be affected today in 2022 and this number is projected to be 150 million by 2050. Many factors contribute to the growing numbers of the potentially treatable population, including “baby boomers” reaching age 65 and increasing life expectancy beyond 80.

Other Target Indications

Our immediate next pipeline opportunities include: ATH-1020 for neuropsychiatric indications and ATH-1019 for peripheral neuropathy. Neuropsychiatric indications, specifically depression and schizophrenia, are estimated to affect approximately 280 million and 20 million people worldwide, respectively. In the U.S., 13.1 million adults 18 and older and 3.2 million Americans are affected by depression and schizophrenia, respectively. Beyond these specific examples of depression and schizophrenia, and with a reported lifetime prevalence of nearly 30% for all neuropsychiatric indications, the addressable 2020 patient population of adults 18 and older is reported to reach nearly 50 million in the U.S. alone.

The estimated prevalence of peripheral neuropathy in the U.S. averages approximately 10% but could be higher due to a larger undiagnosed population. Conservatively, and with nearly 10% of the U.S. population over 30 years old estimated to be diagnosed with some form of neuropathy, the reported addressable patient population today is approximately 30 million patients for peripheral neuropathy, a type of neuropathic pain, alone.

Potential Commercialization Plan

Fosgonimeton is initially being developed as a regenerative medicine for AD. For the initial target patient population of mild-to-moderate AD patients, our commercialization strategy of fosgonimeton will consider the following key elements:

- potential first-line therapy;
- an add-on therapy for patients on existing therapies;
- a monotherapy for patients who are not suitable for acetylcholinesterase inhibitors, or AChEIs;
- a monotherapy for patients who have stopped AChEIs due to loss of effect or side effects; and
- a treatment to other dementias such as PDD, Lewy body dementia and Frontal temporal dementia over time.

We aim to demonstrate the unique short- and long-term value provided by fosgonimeton by linking the core symptoms of dementia (cognition and behavioral and psychological symptoms of dementia) to both improved outcomes and reduced costs and the benefits of fosgonimeton through increased compliance rates in our initial indications.

We anticipate exploring two distribution strategies for fosgonimeton, traditional wholesaler and specialty pharmacy. While the traditional wholesaler could be a suitable option, we believe that the additional patient services that could be provided through specialty pharmacy may offer more value to

patients, caregivers, and their providers. Such services could include training on subcutaneous administration, patient counseling and assistance with reimbursement or insurance issues. This could also allow us to reduce the need for costly in house or field-based resources such as patient training or reimbursement support specialists.

Manufacturing

We are focused on the development of small molecule therapeutics which enables us to use well-established and widely available manufacturing processes and infrastructure, formulation compositions, and drug administration technologies or devices. We do not currently operate our own facilities for manufacturing, storing, or distributing our product candidates. We utilize third-party contract development and manufacturing organizations, or CDMOs, to manufacture and supply our preclinical and clinical materials during the development of our product candidates. We and various regulatory bodies have audited the CDMOs we contract with, and they have a proven track record of FDA-compliant manufacturing with an infrastructure to support large and commercial scale manufacturing.

We have enough fosgonimeton supply to support our LIFT-AD Phase 3 and our ACT-AD Phase 2 clinical trials in AD. We believe the synthesis of fosgonimeton is reliable and reproducible and the synthetic routes can be further optimized to enable large-scale production that continues to avoid use of toxic materials or specialized equipment or handling during the manufacturing process. We continue to optimize the manufacturing process to support future large-scale and commercial supply. Fosgonimeton is purified as a stable solid and then released to additional CDMOs for formulation and packaging into final drug product for use in clinical testing.

The final drug product profile is a ready-to-use pre-filled syringe with a clear, non-viscous aqueous solution of fosgonimeton. The syringes utilize materials and components that are readily available commercially. The fosgonimeton drug product has shown extended stability (at least 2 years) under storage conditions when stored in vials that were composed of identical materials to the syringes. Confirmatory stability studies in syringes are ongoing and data collected thus far support the translation of the extended stability from vials to syringes under refrigerated conditions as well as short-term dispensation and at-home storage in ambient conditions. Room temperature storage allows patients to avoid cumbersome storage requirements and reduces overall burden.

We plan to maintain our focus to identify and develop small molecule product candidates that are expected to have cost-effective manufacturing using third party CDMOs.

We expect to use similar contract resources for commercialization of our products, at least until our resources and operations are at a scale that justifies investment in internal manufacturing capabilities.

Competition

The biotechnology and biopharmaceuticals industries are characterized by rapid technological advancement, significant competition, and an emphasis on intellectual property. As a clinical-stage biopharmaceutical company developing small molecules to restore neuronal health and slow neurodegeneration, with our most advanced product candidates focused on the treatment of AD and dementia, we face, and in the future may face, increased competitive pressures from both large and small pharmaceutical companies and from established and emerging biotechnology companies, as well as academic, government, and public and private research institutions. Any product candidates that we successfully develop and commercialize will compete with current treatments and new treatments that may become available in the future. With the advancement of fosgonimeton as a novel small molecule therapeutic positively modulating a neurotrophic factor pathway, the HGF/MET system, and its liquid formulation as a subcutaneous deliverable, we also consider as competitors companies developing small molecule AD therapies targeting neurotrophic factors with or without a subcutaneous route of administration.

Because of the range of potential competitors, many of our competitors, alone or with strategic partners, have greater access to financial resources, market presence, and resources and expertise in development, preclinical and clinical testing, manufacturing, commercialization, the regulatory approval process, and/or marketing and sales than we do. In addition, these same competitors, who may be in a clinical development stage, could also be competing with us for patient recruitment, clinical research organization, and operational resources. These entities also compete with us in the recruitment and retaining of qualified scientific and management personnel, as well as the acquisition of enabling or complementary technologies for advancing fosgonimeton across all competitors. Merger and acquisition activity in the biotechnology and biopharmaceutical industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. Our commercial opportunity could be substantially limited if our competitors develop and commercialize products that are more effective, safer, more convenient or less expensive than our comparable products. In geographies that are critical to our commercial success, competitors may also obtain regulatory approvals before us, resulting in our competitors building a strong market position in advance of the entry of our products. In addition, our ability to compete may be affected in many cases by insurers or other third-party payors seeking to encourage the use of other treatments.

Key competitive forces that could potentially affect the success of our products, if approved, are safety, efficacy, price, adoption, convenience, time-to-market, level of promotional activity, intellectual property protection, and reimbursement likelihood from government and private payors. Despite these forces, we view our competitive advantage in not only our lead product candidate, fosgonimeton, but also our novel pipeline of therapeutics with a focus on overall neuronal health. In particular, the following summarizes certain categories of our potential competition.

As a small molecule therapeutic targeting the HGF/MET system, we are aware of a number of potential competitors in this space, including ANG-3777, an HGF mimetic, developed by Angion for the treatment of kidney injury; KP-100, a recombinant HGF protein, developed by Kringle Pharma for acute spinal cord injury and ALS; and Collategene developed by Mitsubishi Tanabe and AnGes as a gene therapy for the treatment of critical limb ischemia. Although ANG-3777 was reported to not have reached primary endpoints for their Phase 2 and 3 trials in 2021, the scientific basis remains unchanged and the company is evaluating next steps for the program. KP-100 is currently in Phase 3 studies for acute spinal cord injury and Phase 2 studies for ALS. Collategene was launched in Japan in the third quarter of 2019. In addition, we are aware of p75 ligands being developed by PharmatrophiX for the treatment of neurodegenerative and other disorders, including AD, as well as VM-202, a regenerative plasmid DNA therapy candidate in Phase 3 development by Helixmith for the treatment of diabetic peripheral neuropathy. We are not aware of any direct competitors currently targeting the HGF/MET system for neurological conditions.

Fosgonimeton is being advanced as either a monotherapy (potentially as a first-line therapy) or an add-on therapy for patients on AChEIs. In addition to being a potential add-on therapy to currently approved therapies, we do not anticipate fosgonimeton to be a direct competitor to, but rather complementary to, other therapeutic developments focused on Aβ, pTau, AChE, BACE inhibitors, inflammation and others. Similarly, because fosgonimeton presents a novel mechanism of action, we do not view monoclonal antibody therapies currently approved or under development by large pharmaceutical companies of which we are aware, including Biogen, Eisai, Eli Lilly and Roche, as competitors, but potentially as complementary to our approach.

Intellectual Property

We own or have in-licensed numerous patents and patent applications and possess substantial know-how and trade secrets relating to the development and commercialization of our product candidates, including related manufacturing processes and technologies.

As of December 31, 2021, our patent portfolio includes our exclusively owned intellectual property, including one issued U.S. patent, two pending U.S. patent applications, one issued patent in a jurisdiction outside of the United States, nine pending patent applications in jurisdictions outside of the United States,

and three pending international patent applications filed under the Patent Cooperation Treaty. The patents and patent applications issued and pending outside the United States are generally counterparts to the foregoing U.S. patents and patent applications and are held in Europe, Canada, Japan, Australia, Hong Kong, India, China, Argentina and Taiwan. These owned patents and patent applications have claims directed to fosgonimeton and related compounds, including but not limited to ATH-1019 and ATH-1020, methods of using fosgonimeton, and methods of using related compounds, including but not limited to ATH-1019 and ATH-1020. We intend to pursue, when possible, further composition, method of use, dosing, formulation, and device patent protection directed to the neuroregenerative products and processes we develop. We may also pursue patent protection with respect to manufacturing and drug development processes and technology.

Our patent portfolio also includes eight issued U.S. patents and approximately 13 patents issued and one patent application pending in jurisdictions outside of the United States that are exclusively licensed to us by Washington State University. Our in-licensed patents and patent applications include, among others, claims directed to dihexa, the active metabolite of fosgonimeton.

Individual patents extend for varying periods of time, depending upon the date of filing of the patent application, the date of patent issuance, and the legal term of patents in the countries in which they are obtained. Generally, patents issued for applications filed in the United States are effective for 20 years from the earliest nonprovisional filing date. In addition, in certain instances, a patent term can be adjusted or extended to recapture a portion of the term effectively lost as a result of the USPTO delay and the FDA regulatory review period. The restoration period for FDA delay cannot be longer than five years and the total patent term, including the restoration period, must not exceed 14 years following FDA approval. The duration of patents outside of the United States varies in accordance with provisions of applicable local law, but typically is also 20 years from the earliest nonprovisional filing date. However, the actual protection afforded by a patent varies on a product-by-product basis, from country-to-country, and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country, and the validity and enforceability of the patent. Our in-licensed issued patents will expire on dates ranging from 2023 to 2035, exclusive of any patent term adjustment or patent term extension. Our owned issued patents will expire in 2037, exclusive of any patent term adjustment or patent term extension. If patents are issued on our owned pending patent applications, the resulting patents are projected to expire on dates ranging from 2037 to 2041, exclusive of any patent term adjustment or patent term extension.

When appropriate, we seek to protect aspects of our technology and business not amenable to, or that we do not consider appropriate for, patent protection as trade secrets. We seek to protect this intellectual property, in part, as trade secrets, by entering into confidentiality agreements with those who have access to our confidential information, including our employees, contractors, consultants, collaborators, and advisors. We also seek to preserve the integrity and confidentiality of our proprietary technology and processes by maintaining physical security of our premises and physical and electronic security of our information technology systems.

We seek trademark protection in the United States and in certain other jurisdictions where available and when we deem appropriate. Our trademark portfolio currently consists of two pending trademark applications in the United States, two pending trademark applications in Australia, two issued trademark registrations in the United Kingdom, and two issued trademark registrations in the European Union.

Our Collaboration and Grant Agreements

Amended and Restated Washington State University License Agreement

We are party to an amended and restated exclusive license agreement with Washington State University (“WSU”) that we entered into in September of 2015. Under this agreement, WSU granted us an exclusive license to make, use, sell, and offer for sale products covered by certain licensed patents, including dihexa, the chemical compound into which fosgonimeton metabolizes following administration. We do not expect WSU’s joint ownership of the patent with Pacific Northwest Biotechnology, Inc. will

materially affect our license of such patent or the development of any of our product candidates to which the patent relates.

The initiation of our first Phase 2 clinical trial in September 2020 triggered a $50,000 liability to WSU.

We may also be obligated to pay to WSU the following if the related milestones are reached:

- $300,000 – At initiation of the first Phase 3 clinical trial in the United States, European Union or Japan for the first licensed product.
- $600,000 – Marketing approval in the United States, European Union or Japan for the first licensed product.

We are obligated to pay WSU a royalty in the mid-single digits of net sales.

Additionally, under the agreement we have the right to sublicense the licensed rights, subject to additional payments to WSU for sublicense consideration received. Such amounts are dependent on the terms of the underlying sublicense, and range from the mid-single digits to mid tens of any non-sales based payments received, and low twenties of net sales-based sublicense royalties.

The term of the agreement will continue until the earlier of the date that no valid claim in a licensed patent remains enforceable or payment of earned royalties, once such payments begin, ceases for more than four consecutive calendar quarters. We have not yet commenced payment of royalties to WSU pursuant to the terms of the agreement, since, as of the date of this report, we do not have any approved products with respect to which we may generate revenue. If any of our product candidates to which the patents relate are approved for commercial sale, our obligations to pay royalties would commence upon net sales of such approved product candidates and cease no later than the date that no valid claim in a licensed patent remains enforceable. Such licensed patents in major markets with respect to indications we are currently pursuing will expire on dates ranging from 2023 to 2032, exclusive of any patent term adjustment or patent term extension. We may terminate this agreement with 90 days' prior written notice to WSU. WSU may terminate this agreement with 90 days' prior written notice if we fail to achieve certain performance milestones by the agreed upon dates. WSU may also terminate this agreement with 90 days' prior written notice (or thirty days' prior written notice in the case of our failure to make a timely payment owed to WSU) following our failure to conduct certain development activities for two consecutive calendar quarters or upon our material breach of the agreement and our failure to cure any such breach within 90 days of our receipt of notice of such breach from WSU (or within 30 days in the case of our failure to make a timely payment owed to WSU).

Grant Liability

In 2014 and 2015, we received $250,000 and $500,000, respectively, from the Washington Life Sciences Discovery Fund ("LSDF") under the terms of two matching grant award agreements. The consummation of the Company's initial public offering in September 2020 was a triggering event under the terms of the grant and the liability was remeasured to the pay-off amount of $1.5 million as of September 30, 2020 and repaid in full as of December 31, 2020.

National Institutes of Health Grant

In December 2020, we accepted a grant from the National Institutes of Health ("NIH") for Alzheimer's research in the amount of approximately $7.8 million with the potential for an additional $7.4 million up to an aggregate of $15.2 million, subject to the availability of funds and satisfactory progress of the research. As this grant involves federally funded research, per the Bayh-Dole Act, we will be obligated to (1) report each new invention to the government, (2) decide whether to retain ownership, (3) file for patent protection to retain title, and (4) provide a license to the government to practice the invention. The "march-in" rights provided by the Bayh-Dole Act would apply to new subject matter arising from the use of the NIH funds, but would exclude pre-existing subject matter such as our product candidates existing prior to the receipt of

such grant. We also are expected to commercialize any inventions we file patent protection on for the benefit of public health. For more information see the section of this report titled “Risk Factors—Risks Relating to Our Intellectual Property—Intellectual property discovered through government funded programs may be subject to federal regulations such as “march-in” rights, certain reporting requirements and a preference for U.S.-based companies. Compliance with such regulations may limit our exclusive rights and limit our ability to contract with non-U.S. manufacturers.”

Government Regulation

Government authorities in the United States, at the federal, state, and local level, and other countries extensively regulate, among other things, the research, development, nonclinical and clinical testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, post-approval monitoring and reporting, marketing, and export and import of products such as those we are developing. Generally, before a new drug can be marketed, considerable data must be generated, which demonstrate the drug’s quality, safety, and efficacy. Such data must then be organized into a format specific for each regulatory authority, submitted for review and approved by the regulatory authority.

U.S. Drug Development Process

In the United States, the FDA regulates drugs under the federal Food, Drug, and Cosmetic Act, or 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, the 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 nonclinical 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 IRB ethics committee, either centralized or with respect to each clinical site, before each clinical trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with GCP requirements 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;
- determination by the FDA within 60 days of its receipt of an NDA to accept the filing for substantive review;
- 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 cGMP requirements to ensure 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 investigational new drug 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. 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 clinical 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 may review data and endpoints at designated check points, make recommendations and/or 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 or 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. In the case of some products for severe or life-threatening diseases, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is often conducted in patients.
- *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 clinical trials, sometimes referred to as Phase 4 studies, may be conducted after initial marketing approval. These clinical 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. In addition, some clinical trials are overseen by an independent group of qualified experts organized by the sponsor, known as a data safety monitoring board or committee. Depending on its charter, this group may determine whether a clinical trial may move forward at designated check points based on access to certain data from the clinical trial.

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 clinical 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.

NDA Review and Approval Process

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, the results of product development nonclinical 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 (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 12 months from the date the NDA is submitted to FDA because the FDA has approximately two months to make a "filing" decision after 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 is also 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 an 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 pivotal Phase 3 clinical trial 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, 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 on the indicated uses for which such product may be marketed. For example, the FDA may approve the NDA with a 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. It 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 offer conditional approval subject to, 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.

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 product is eligible for priority review if it has the potential to provide safe and effective therapy where no satisfactory alternative therapy exists or a significant improvement in the treatment, diagnosis, or prevention of a disease 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. 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, priority review, accelerated approval, and breakthrough therapy designation 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. We may explore some of these opportunities for our product candidates as appropriate.

Post-Approval Requirements

Any products manufactured or distributed by us 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 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 us and our third-party 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 post-approval or Phase IV clinical studies, if applicable;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of product license 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 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 by us 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 manufacturer's 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 and approval of certain marketing applications for products containing the same active ingredient. The FDCA permits patent term restoration of up to five years as compensation for a patent term lost during product development and FDA regulatory review process to the first applicant to obtain approval of an NDA for a new chemical entity in the United States. Patent-term restoration, however, cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. 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 (ANDA) or an NDA submitted under Section 505(b)(2) (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 nonclinical 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 manufacturers are subject to additional healthcare laws, 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 anti-kickback, anti-self-referral, false claims, transparency, including the federal Physician Payments Sunshine Act, consumer fraud, pricing reporting, data privacy, data protection, and security laws and regulations as well as similar foreign laws in the jurisdictions outside the U.S. Similar state and local laws and regulations may also restrict business practices in the pharmaceutical industry, such as state anti-kickback and false claims laws, which may apply to business practices, including but not limited to, research, distribution, sales, and marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, or by patients themselves; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the 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; state and local laws which require the tracking of gifts and other remuneration and any transfer of value provided to physicians, other healthcare providers and entities; and state and local laws that require the registration of pharmaceutical sales representatives; and state and local laws governing the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

The risk of our being found in violation of these or other laws and regulations is increased by the fact that many have not been fully interpreted by the regulatory authorities or the courts and their provisions are open to various interpretations. These laws and regulations are subject to change, which can increase the resources needed for compliance and delay drug approval or commercialization. Any action brought against us for violations of these laws or regulations, even successfully defended, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. Also, we may be subject to private "qui tam" actions brought by individual whistleblowers on behalf of the federal or state governments. Actual or alleged violation of any such laws or regulations may lead to investigations and other claims and proceedings by regulatory authorities and in certain cases, private actors, and violation of any of such laws or any other governmental regulations that apply may result in penalties, including, without limitation, significant administrative, civil and criminal penalties, damages, fines, additional reporting

obligations, and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws, the curtailment or restructuring of operations, exclusion from participation in government healthcare programs and imprisonment.

Coverage and Reimbursement

Sales of any pharmaceutical product depend, in part, on the extent to which such product will be covered by third-party payors, such as federal, state, and foreign government healthcare programs, commercial insurance, and managed healthcare organizations, and the level of reimbursement for such product by third-party payors. Significant uncertainty exists as to the coverage and reimbursement status of any newly approved product. Decisions regarding the extent of coverage and amount of reimbursement to be provided are made on a plan-by-plan basis. One third-party payor's decision to cover a particular product does not ensure that other payors will also provide coverage for the product. As a result, the coverage determination process can require manufacturers to provide scientific details, information on cost-effectiveness, and clinical support for the use of a product to each payor separately. This can be a time-consuming process, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance.

In addition, third-party payors are increasingly reducing reimbursements for pharmaceutical products and related services. The U.S. government and state legislatures have continued implementing cost-containment programs, including price controls, restrictions on coverage and reimbursement and requirements for substitution of generic products. Third-party payors are increasingly challenging the prices charged, examining the medical necessity and reviewing the cost effectiveness of pharmaceutical products, in addition to questioning 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. 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.

In international markets, reimbursement and healthcare payment systems vary significantly by country, and many countries have instituted price ceilings on specific products and therapies. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the medicinal product on the market. Pharmaceutical products may face competition from lower-priced products in foreign countries that have placed price controls on pharmaceutical products and may also compete with imported foreign products. Furthermore, there is no assurance that a product will be considered medically reasonable and necessary for a specific indication, that it will be considered cost-effective by third-party payors, that an adequate level of reimbursement will be established even if coverage is available, or that the third-party payors' reimbursement policies will not adversely affect the ability for manufacturers to sell products profitably.

Healthcare Reform

In the United States and certain foreign jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes to the healthcare system. In March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively, the ACA, was signed into law, which substantially changed the way healthcare is financed by both governmental and private insurers in the United States. By way of example, the ACA increased the minimum level of Medicaid rebates payable by manufacturers of brand name drugs from 15.1% to 23.1%; it required collection of rebates for drugs paid by Medicaid managed care organizations; imposed a non-deductible annual fee on pharmaceutical manufacturers or importers who sell certain "branded prescription drugs" to specified federal government programs; it implemented a new methodology under which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted, or injected; it expanded the eligibility

criteria for Medicaid programs; it 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 it established a Center for Medicare Innovation at the Centers for Medicare & Medicaid Services, or 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 executive, judicial and Congressional challenges to certain aspects of the ACA. For example, in June 2021 the U.S. Supreme Court held that Texas and other challengers had no legal standing to challenge the ACA, dismissing the case on procedural grounds without specifically ruling on the constitutionality of the ACA. Thus, the ACA will remain in effect in its current form. It is possible that the ACA will be subject to judicial or Congressional challenges in the future. It is unclear how any such challenges and healthcare measures promulgated by the Biden administration will impact the ACA, our business, financial condition and results of operations. On January 28, 2021, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through May 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructs certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA.

Other legislative changes have been proposed and adopted since the ACA was enacted. These changes include aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, effective April 1, 2013, which, due to subsequent legislative amendments, will stay in effect through 2031 with the exception of a temporary suspension implemented under various COVID-19 relief legislation from May 1, 2020 through March 31, 2022, unless additional congressional action is taken. Under current legislation, the actual reduction in Medicare payments will vary from 1% in 2022 to up to 3% in the final fiscal year of this sequester. 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 legislation designed, among other things, to bring more transparency to product pricing, to review the relationship between pricing and manufacturer patient programs, and to reform government program reimbursement methodologies for pharmaceutical products. For example, in 2020, HHS and CMS issued various rules that are expected to impact, among others, price reductions from pharmaceutical manufacturers to plan sponsors under Part D, fee arrangements between pharmacy benefit managers and manufacturers, manufacturer price reporting requirements under the Medicaid Drug Rebate Program, including regulations that affect manufacturer-sponsored patient assistance programs subject to pharmacy benefit manager accumulator programs and Best Price reporting related to certain value-based purchasing arrangements. Multiple lawsuits have been brought against the HHS challenging various aspects of the rules implemented during the Trump administration. As a result, the Biden administration and HHS have delayed the implementation or published rules rescinding some of these Trump-era policies. Under the American Rescue Plan Act of 2021, effective January 1, 2024, the statutory cap on Medicaid Drug Rebate Program rebates that manufacturers pay to state Medicaid programs will be eliminated. Elimination of this cap may require pharmaceutical manufacturers to pay more in rebates than it receives on the sale of products, which could have a material impact on our business. In addition, Congress is considering legislation that, if passed, could have significant impact on prices of prescription drugs covered by Medicare, including limitations on drug price increases and allowing Medicare to negotiate pricing for certain covered drug products. The impact of these regulations and any future healthcare measures and agency rules implemented by the Biden administration on us and the pharmaceutical industry as a whole is currently unknown. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability, or commercialize our product candidates if approved.

In addition, 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, mechanisms to encourage importation from other countries and bulk purchasing. A number of states are considering or have recently enacted state drug

price transparency and reporting laws that could substantially increase our compliance burdens and expose us to greater liability under such state laws once we begin commercialization after obtaining regulatory approval for any of our products. It is possible that additional governmental action may be taken to address the COVID-19 pandemic. Furthermore, there has been increased interest by third party payors and governmental authorities in reference to pricing systems and publication of discounts and list prices. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our product candidates.

Employees and Human Capital Resources

As of December 31, 2021, we had 35 employees, 34 of whom were full-time and 20 of whom were engaged in research and development activities. Eleven of our employees hold Ph.D. or M.D. degrees. Substantially all of our employees are located in the greater Seattle, Washington area. None of our employees are represented by a labor union or covered under a collective bargaining agreement. We consider our relationship with our employees to be good.

Our human capital resources objectives include, as applicable, identifying, recruiting, retaining, incentivizing and integrating our existing and new employees, advisors and consultants. The principal purposes of our equity and cash incentive plans are to attract, retain and reward personnel through the granting of stock-based and cash-based compensation awards, in order to increase stockholder value and the success of our company by motivating such individuals to perform to the best of their abilities and achieve our objectives.

Corporate Information

We were incorporated in Washington as a corporation in March 2011 under the name M3 Biotechnology, Inc. In October 2015, we converted to a Delaware corporation and subsequently changed our name to “Athira Pharma, Inc.” Our principal executive office is located at 18706 North Creek Parkway, Suite 104, Bothell Washington 98011. Our telephone number is (425) 620-8501. Our website is www.athira.com. Information contained in, or that can be accessed through, our website is not a part of, and is not incorporated into, this report, and the inclusion of our website address in this report is an inactive textual reference only.

We make available on or through our website certain reports and amendments to those reports that we file with or furnish to the SEC in accordance with the Securities Exchange Act of 1934, as amended. These include our annual reports on Form 10-K, our quarterly reports on Form 10-Q, and our current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. We make this information available on or through our website free of charge as soon as reasonably practicable after we electronically file the information with, or furnish it to, the SEC.

Item 1A. Risk Factors.

You should carefully consider the *following risk factors, in addition to* the other information *contained in this Annual Report on Form 10-K*, including the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section *and our consolidated financial statements and related notes. If any of the events described in the following risk factors and the risks described elsewhere in this report occurs, our business, operating results and financial condition could be seriously harmed. This report also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in the forward-looking statements as a result of factors that are described below and elsewhere in this report. Our Risk Factors are not guarantees that no such conditions exist as of the date of this report and should not be interpreted as an affirmative statement that such risks or conditions have not materialized, in whole or in part.*

Risks Relating to Our Business and the Development of Our Product Candidates

We are a late clinical-stage biopharmaceutical company with a limited operating history.

We are a late clinical-stage biopharmaceutical company focused on developing small molecules to restore neuronal health and stop neurodegeneration. Our limited operating history may make it difficult to evaluate the success of our business. Drug development is a highly uncertain undertaking and involves a substantial degree of risk. To date, we have not initiated or completed a pivotal clinical trial, obtained marketing approval for any product candidate, manufactured a commercial scale product candidate, arranged for a third party to do so on our behalf, or conducted sales and marketing activities necessary for successful product candidate commercialization. Our history as a company makes any assessment of our future success and viability subject to significant uncertainty. We will encounter risks and difficulties frequently experienced by clinical-stage biopharmaceutical companies in rapidly evolving fields, and we have not yet demonstrated an ability to overcome such risks and difficulties successfully. If we do not address these risks and difficulties successfully, our business will suffer.

We may fail to or be unable to design and execute clinical trials to support marketing approval of fosgonimeton or any of our other product candidates. We cannot be certain that our current or planned clinical trials or any other future clinical trials will be completed on time or be successful. We cannot guarantee that the U.S. Food and Drug Administration, or FDA, or foreign regulatory authorities will interpret clinical trial results as we do, and more clinical trials could be required before we are able to submit applications seeking approval of our product candidates. To the extent that the results of the clinical trials are not satisfactory to the FDA or foreign regulatory authorities for support of a marketing application, we may be required to expend significant resources, which may not be available to us, to conduct additional clinical trials in support of potential approval of our product candidates. Even if regulatory approval is secured for any of our product candidates, the terms of such approval may limit the scope and use of our product candidate, which may also limit its commercial potential.

Our ability to generate revenue and achieve profitability depends significantly on our ability to achieve a number of objectives.

Our business depends entirely on the successful discovery, development and commercialization of our product candidates. We have no products approved for commercial sale and do not anticipate generating any revenue from product sales for the next several years, if ever. Our ability to generate product revenue will depend heavily on the successful clinical development and eventual commercialization of fosgonimeton and one or more of our other future product candidates. Our ability to generate revenue and achieve profitability depends significantly on our ability to achieve a number of objectives, including:

- successful and timely completion of nonclinical and clinical development of our product candidates and any future product candidates, as well as the associated costs, including any

unforeseen costs we may incur as a result of nonclinical study or clinical trial delays due to COVID-19 or other causes;

- establishing and maintaining relationships with contract research organizations, or CROs, and clinical sites for the clinical development, both in the United States and internationally, of our product candidates and any future product candidates;
- timely receipt of marketing approvals from applicable regulatory authorities for any product candidates for which we successfully complete clinical development;
- making any required post-marketing approval commitments to applicable regulatory authorities;
- developing an efficient and scalable manufacturing process for our product candidates, including obtaining finished products that are appropriately packaged for sale;
- establishing and maintaining commercially viable supply and manufacturing relationships with third parties that can provide adequate, in both amount and quality, products and services to support clinical development and meet the market demand for product candidates that we develop, if approved;
- successful commercial launch following any marketing approval, including the development of a commercial infrastructure, whether inhouse or with one or more collaborators;
- a continued acceptable safety profile following any marketing approval of our product candidates;
- commercial acceptance of our product candidates by patients, the medical community and third-party payors;
- identifying, assessing and developing new product candidates;
- obtaining, maintaining and expanding patent protection, trade secret protection and regulatory exclusivity, both in the United States and internationally;
- protecting our rights in our intellectual property portfolio;
- defending against third-party interference or infringement claims, if any;
- negotiating favorable terms in any collaboration, licensing or other arrangements that may be necessary or desirable to develop, manufacture or commercialize our product candidates;
- obtaining coverage and adequate reimbursement by hospitals, government and third-party payors for product candidates that we develop;
- addressing any competing therapies and technological and market developments; and
- attracting, hiring and retaining qualified personnel.

We may never be successful in achieving our objectives and, even if we do, may never generate revenue that is significant or large enough to achieve profitability. If we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable may decrease the value of our company and could impair our ability to maintain or further our research and development efforts, raise additional necessary capital, grow our business and continue our operations.

We may also experience delays in developing a sustainable, reproducible and scalable manufacturing process or transferring that process to commercial partners, which may prevent us from completing our clinical trials or commercializing our product candidates on a timely or profitable basis, if at all. Changes in the manufacturing process or facilities will require further comparability analysis and approval by the FDA before implementation, which could delay our clinical trials and product candidate development, and could require additional clinical trials, including bridging studies, to demonstrate consistent and continued safety and efficacy.

We have not previously submitted a new drug application, or NDA, to the FDA or similar approval filings to a comparable foreign regulatory authority, for any product candidate. An NDA or other relevant regulatory filing must include extensive nonclinical and clinical data and supporting information to establish that the product candidate is safe and effective for each desired indication. The NDA or other relevant regulatory filing must also include significant information regarding the chemistry, manufacturing and controls for the product. We cannot be certain that our current or future product candidates will be successful in clinical trials or receive regulatory approval. Further, even if they are successful in clinical trials, our product candidates or any future product candidates may not receive regulatory approval. If we do not receive regulatory approvals for current or future product candidates, we may not be able to continue our operations. Even if we successfully obtain regulatory approval to market a product candidate, our revenue will depend, in part, upon the size of the markets in the territories for which we gain regulatory approval and have commercial rights, as well as the availability of competitive products, whether there is sufficient third-party reimbursement and adoption by physicians.

Our development of fosgonimeton may never lead to a marketable product.

We are developing fosgonimeton as a small molecule aimed at restoring neuronal health. We have not received regulatory approval for fosgonimeton and cannot be certain that our approach will lead to the development of an approvable or marketable product, alone or in combination with other therapies. We may not succeed in demonstrating safety and efficacy of fosgonimeton in our LIFT-AD trial or in other clinical trials.

Advancing fosgonimeton as a small molecule aimed at restoring neuronal health creates significant challenges for us, including:

- obtaining marketing approval;
- if fosgonimeton is approved, educating medical personnel regarding the potential efficacy and safety benefits, as well as the challenges, of incorporating fosgonimeton into existing treatment regimens, including in combination with other treatments for AD; and
- establishing the sales and marketing capabilities upon obtaining any marketing approvals to gain market acceptance.

Our approach to targeting brain growth factors through the use of small molecules is based on a novel therapeutic approach, which exposes us to unforeseen risks. We have limited data from our Phase 1a/1b clinical trial, including only 11 patients with mild to moderate AD, and we cannot be certain that future trials will yield similar data. In addition, our use of EEG methods to gather data requires placement of electrodes on a subject's scalp and, if not properly placed, we may be unable to obtain the data sought or data obtained may be unreliable.

We have discovered and are developing a platform of small molecule product candidates from which we have selected our lead product candidate, fosgonimeton, which is under development to treat Alzheimer's disease, or AD, and Parkinson's disease dementia, or PDD. Our product candidates target a brain growth factor which is expected to increase synaptic density, recovery in the network and information transmission in the brain, which we believe could ultimately result in improvement in cognition and clinical symptoms. The therapeutic promise of brain growth factors in neurodegenerative disorders had been hampered in earlier therapies by the lack of efficient and non-invasive delivery to the brain. Our small molecule product candidates are designed to penetrate the blood brain barrier and enhance the activity of a brain growth factor, but we cannot be certain that our clinical trials will provide sufficient evidence that our design approach results in the intended therapeutic effect.

Based on the results of our nonclinical and clinical studies to date, we believe fosgonimeton has the potential to rapidly improve cognition and durably restore the lives of patients suffering from AD. However, these ideas and this approach are novel, and we currently have limited data based on our Phase 1a/b clinical trial, which enrolled 88 subjects, including only 11 patients with mild to moderate AD, of whom seven patients were treated with fosgonimeton and the other four patients were randomized to the control. Data from our Phase 1a/1b clinical trial, while promising, were obtained from a relatively small number of subjects

and a single clinical site and we cannot be certain that future trials involving a larger number of subjects and clinical sites will yield similar data. Additionally, in our Phase 1a/1b clinical trial, we used electroencephalogram, or EEG, methods to gather data that we believe provide valuable insight into cognitive processing of the subjects evaluated. These EEG methods require the placement of electrodes on a subject's scalp and, if these electrodes are not properly placed, we may be unable to obtain the data sought or the data obtained may be compromised and unreliable. In our Phase 1a/1b clinical trial, data from certain subjects were not obtained due to problems encountered with the placement of the EEG electrodes and other technical issues, such as subject movement. While we believe the lack of data from these subjects did not impact the reliability or interpretation of the remaining data from this trial, we may in the future face similar issues with EEG methods, which could compromise future clinical trial results. We may ultimately discover that fosgonimeton, or any of our other small molecules, do not possess certain properties required for therapeutic effectiveness. We have no long-term evidence regarding the efficacy, safety and tolerability of fosgonimeton or other small molecules in our product platform. We may spend substantial funds attempting to develop these product candidates and never succeed in doing so.

We have concentrated our research and development efforts on the treatment of central nervous system and peripheral degenerative disorders, a field that has seen very limited success in product development.

We have focused our research and development efforts on addressing central nervous system, or CNS, and peripheral degenerative disorders. Collectively, efforts by pharmaceutical companies in the field of CNS and peripheral degenerative disorders have seen very limited successes in product development. The development of CNS therapies presents unique challenges, including an imperfect understanding of the biology, the presence of the blood brain barrier, or BBB, that can restrict the flow of drugs to the brain, a frequent lack of translatability of preclinical study results in subsequent clinical trials and dose selection, and the product candidate having an effect that may be too small to be detected using the outcome measures selected in clinical trials or if the outcomes measured do not reach statistical significance. There are few effective therapeutic options available for patients with AD and other CNS or peripheral disorders. Our future success is highly dependent on the successful development of our technology and our product candidates for treating CNS and peripheral disorders. Developing and, if approved, commercializing our product candidates for treatment of CNS and peripheral disorders subjects us to a number of challenges, including ensuring that we have selected the optimal doses, executing an appropriate clinical trial to test for efficacy and obtaining regulatory approval from the FDA and other regulatory authorities.

An independent special committee of our board of directors engaged in a review of papers co-authored by our former chief executive officer in connection with her doctoral research at Washington State University. The special committee's findings included that (i) our former chief executive office altered images in her 2011 doctoral dissertation and at least four research papers that she co-authored while a graduate student at Washington State University, and published from 2011 to 2014, (ii) that we cited challenged research papers in certain communications and applications, and (iii) that WSU's dihexa patent, exclusively licensed to us, incorporated certain of these altered images. Washington State University has undertaken a review of claims of potential research misconduct involving our former chief executive officer's doctoral research at Washington State University. We cannot predict when WSU's investigation will be completed or what conclusions WSU will reach.

An independent special committee of our board of directors engaged in a review of papers co-authored by our former chief executive officer, Dr. Leen Kawas, in connection with her doctoral research at WSU, including, among other things, an investigation of allegations that Dr. Kawas altered images used in research published by Dr. Kawas in connection with her doctoral studies.

The independent special committee's primary finding was that our former chief executive officer altered images in her 2011 doctoral dissertation and at least four research papers that she co-authored while a graduate student at WSU, and published from 2011 to 2014. While the conduct that was the subject of the allegations is not related to any of our current product candidates or ongoing clinical research, this finding could have a material adverse effect on our reputation, our in-licensed patents and pending patent

applications, licenses and grants, and could lead to further investigation from government agencies, including the FDA, any of which could have a material adverse impact on our business and prospects. As discussed under "*—The loss of any of our key personnel could significantly harm our business, results of operations and competitive position,*" on October 18, 2021, Dr. Kawas submitted her resignation as president and chief executive officer and as a member of our board of directors, effective October 18, 2021. Concurrently with Dr. Kawas's resignation, our board of directors appointed Mark Litton, Ph.D., MBA as president and chief executive officer and as a member of our board of directors.

As disclosed elsewhere in this report, including in this "Risk Factors" section under the heading "*—We and certain of our directors and executive officers have been named as defendants in lawsuits that could result in substantial costs and divert management's attention*," and in "Part I, Item 3—Legal Proceedings," lawsuits have been filed against us and certain of our directors and officers, alleging violations of federal securities laws related to alleged false and misleading statements in connection with the alleged misconduct of Dr. Kawas and others associated with us. As a result of these allegations and the ongoing litigation against us and certain of our directors and officers and related matters, we have been the subject of negative publicity. This negative publicity may harm our credibility, reputation and relationships with current and future investors, government regulators, patent offices, courts, current and prospective employees, key opinion leaders, prospective collaborators, advocacy groups, current and future patients enrolled in our clinical trials, physicians and prospective patients and vendors. For example, this negative publicity may adversely affect our ability to recruit and hire talented employees, maintain existing business relationships with CROs, clinical trial sites and other parties, enter into new business relationships, enroll patients in our clinical trials, and maintain a viable business in the future. Also, it is possible that the negative publicity and its effect on our work environment could cause our employees to terminate their employment or, if they remain employed by us, result in reduced morale that could have a material adverse effect on our business. In addition, negative publicity has and may continue to adversely affect our stock price and, therefore, employees and prospective employees may be less inclined to seek or continue employment with us. As a result, our business, financial condition, results of operations and cash flows could be materially adversely affected.

Washington State University has undertaken a review of claims of potential research misconduct involving our former chief executive officer's doctoral research at Washington State University.

In addition to the investigation of the independent special committee of our board of directors noted above, WSU has also announced that it has undertaken a review of claims of potential research misconduct involving research conducted by Dr. Kawas during her doctoral studies at WSU. We understand this review is ongoing, and at this time we cannot predict what, if any, effect the investigation will ultimately have on our business and reputation. We are also unable to predict with any certainty when WSU's investigation will be completed. It is possible that the ongoing investigation by WSU will come to different conclusions, or uncover additional or different information, than the investigation of the independent special committee of our board of directors, the conclusions of which are discussed under "*—An independent special committee of our board of directors engaged in a review of papers co-authored by our former chief executive officer in connection with her doctoral research at Washington State University. The special committee's findings included that (i) our former chief executive office altered images in her 2011 doctoral dissertation and at least four research papers that she co-authored while a graduate student at Washington State University, and published from 2011 to 2014, (ii) that we cited challenged research papers in certain communications and applications, and (iii) that WSU's dihexa patent, exclusively licensed to us, incorporated certain of these altered images. Washington State University has undertaken a review of claims of potential research misconduct involving our former chief executive officer's doctoral research at Washington State University. We cannot predict when WSU's investigation will be completed or what conclusions WSU will reach*". The conclusions from WSU's investigation could have a material adverse impact on our business, reputation, scientific credibility, and prospects, as well as our in-licensed patents and pending patent applications, current grants and pending grant applications, and our relationship with WSU, from whom we in-license patents and patent applications underlying certain of our product candidates.

Clinical development involves a lengthy and expensive process with an uncertain outcome, and results of early, smaller-scale preclinical studies and clinical trials with a single or few clinical trial sites may not be predictive of eventual safety or effectiveness in large-scale pivotal clinical trials across multiple clinical trial sites. We may encounter substantial delays in clinical trials, or may not be able to conduct or complete clinical trials on the expected timelines, if at all.

Our lead product candidate, fosgonimeton, is in clinical development for the potential treatment of AD and PDD. Our additional product candidates, including ATH-1019 and ATH-1020, are in nonclinical development. It is impossible to predict when or if any of our product candidates will prove to be effective and safe in humans or will receive regulatory approval.

Before obtaining regulatory approvals for the commercial sale of our product candidates, we must demonstrate through lengthy, complex and expensive nonclinical studies and clinical trials that our product candidates are both safe and effective for each target indication. Nonclinical and clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the nonclinical study and clinical trial processes, and, because our product candidates are in an early stage of development, there is a high risk of failure and we may never succeed in developing marketable products. The results of nonclinical studies and early clinical trials of our product candidates may not be predictive of the results of later-stage clinical trials. Although product candidates may demonstrate promising results in nonclinical studies and early clinical trials, they may not prove to be safe or effective in subsequent clinical trials. For example, testing on animals occurs under different conditions than testing in humans and therefore, the results of animal studies may not accurately predict safety and effectiveness in humans. There is typically an extremely high rate of attrition from the failure of product candidates proceeding through nonclinical studies and clinical trials. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy profile despite having progressed through nonclinical studies and initial clinical trials. Likewise, early, smaller-scale studies and clinical trials with a single or few clinical trial sites may not be predictive of eventual safety or effectiveness in large-scale pivotal clinical trials across multiple clinical trial sites. Even if data from a pivotal clinical trial are positive, regulators may not agree that such data are sufficient for approval and may require that we conduct additional clinical trials, which could materially delay our anticipated development timelines, require additional funding for such additional clinical trials, and adversely impact our business. For example, LIFT-AD is a trial that we initiated in September 2020, which may provide pivotal data in support of registration. In November 2020, we initiated ACT-AD, a P300 Phase 2 clinical trial, to better understand the overall effects of fosgonimeton on working memory processing speed and cognitive measures, with topline results expected in the first half of 2022. These data will help support strategic decisions around any additional pivotal trials that we may initiate in parallel to the LIFT-AD trial if the results from the ACT-AD P300 Phase 2 clinical trial do not meet our expectations. However, even if we receive positive data in our ACT-AD and LIFT-AD trials, we cannot be certain that the FDA or other regulators will find such data sufficient for approval of fosgonimeton. Our ability to achieve regulatory approval for fosgonimeton is further complicated by the nature of AD, which historically has been a challenging indication for drug development. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or unacceptable safety issues, notwithstanding promising results in earlier trials. Most product candidates that commence nonclinical studies and clinical trials are never approved as products.

In some instances, there can be significant variability in safety or efficacy results between different nonclinical studies and clinical trials of the same product candidate due to numerous factors, including changes in clinical trial procedures set forth in protocols, differences in the size and type of the patient populations, changes in and adherence to the clinical trial protocols and the rate of dropout among clinical trial participants. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects. In such an event, our clinical trials could be suspended or terminated and the FDA or comparable foreign regulatory authorities could order us to cease further development of or deny approval of our product candidates for any or all targeted indications. Drug-related side effects could also affect patient recruitment or the ability of enrolled patients to complete the clinical trial or result in potential product liability claims. Any of these occurrences may harm our business, financial condition and prospects significantly.

On July 6, 2021, we announced the initiation of an open-label extension for the LIFT-AD and ACT-AD trials. Following completion of the 26-week treatment period during the LIFT-AD or ACT-AD trials, patients may elect to continue on the open-label extension and receive treatment with fosgonimeton for up to an additional 26 weeks. Investigators and patients will remain blinded to treatment group assignment in the original trials. Such open-label extension studies are, and some of the clinical trials we conduct in the future may be, open-label in study design conducted at a limited number of clinical sites on a limited number of patients. An "open-label" clinical trial is one where both the patient and investigator know whether the patient is receiving the investigational product candidate or either an existing approved drug or placebo. Most typically, open-label clinical trials test only the investigational product candidate and sometimes may do so at different dose levels. Open-label clinical trials are subject to various limitations that may exaggerate any therapeutic effect as patients in open-label clinical trials are aware when they are receiving treatment. Open-label clinical trials may be subject to a "patient bias" where patients perceive their symptoms to have improved merely due to their awareness of receiving an experimental treatment. In addition, open-label clinical trials may be subject to an "investigator bias" where those assessing and reviewing the physiological outcomes of the clinical trials are aware of which patients have received treatment and may interpret the information of the treated group more favorably given this knowledge.

We could also encounter delays if a clinical trial is suspended or terminated by us, by the institutional review boards, or IRBs, of the institutions in which such clinical trials are being conducted, by a data safety monitoring board for such clinical trial or by the FDA or comparable foreign regulatory authorities. Clinical trials can be delayed or terminated for a variety of reasons, including delays or failures related to:

- the FDA or comparable foreign regulatory authorities disagreeing as to the design or implementation of our clinical trials;
- the FDA or comparable foreign regulatory authorities disagreeing with our ATH clinical development strategy or statistical plan;
- changes in governmental regulations or administrative actions;
- delays in our ability to commence a clinical trial;
- 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 different CROs and clinical trial sites;
- obtaining IRB approval at each clinical trial site;
- recruiting an adequate number of suitable patients to participate in a clinical trial;
- the number of patients required for clinical trials of our product candidates may be larger than we anticipate;
- having subjects complete a clinical trial or return for post-treatment follow-up;
- clinical trial sites deviating from clinical trial protocol or dropping out of a clinical trial;
- failure to demonstrate a benefit from using a product candidate;
- addressing subject safety concerns that arise during the course of a clinical trial;
- adding a sufficient number of clinical trial sites; or
- obtaining sufficient product supply of product candidate for use in nonclinical studies or clinical trials from third-party suppliers.

Further, conducting clinical trials in foreign countries, as we intend to do for our product candidates, 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. If we experience delays in the completion of, or termination of, any clinical trial of our product candidates, the commercial prospects of our product candidates will be harmed, and our ability to generate product revenues from any of these product candidates will be delayed. Moreover, any delays in completing our clinical trials will increase our costs, slow down our product candidate development and approval process and jeopardize our ability to commence product sales and generate revenues.

If the results of our current and future clinical trials are inconclusive with respect to the efficacy of our product candidates, if we do not meet the clinical endpoints with statistical and clinically meaningful significance, or if there are safety concerns associated with our product candidates, we may:

- incur unplanned costs;
- be delayed in or prevented from obtaining marketing approval for our product candidates;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings including boxed warnings;
- be subject to changes in the way the product is administered;
- be required to perform additional clinical trials to support approval or be subject to additional post-marketing testing requirements;
- have regulatory authorities withdraw their approval of the product or impose restrictions on its distribution in the form of a modified risk evaluation and mitigation strategy, or REMS;
- be subject to the addition of labeling statements, such as warnings or contraindications;
- be sued; or
- experience damage to our reputation.

Any "topline", interim, initial, or 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 nonclinical 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 clinical 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 nonclinical 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.

Additionally, we rely on data received from clinical trials, whether preliminary or final, to inform decisions on future clinical trials, including trial design, trial size, and whether or not to initiate additional clinical trials. For example, in November 2020, we initiated ACT-AD, a P300 Phase 2 clinical trial, to better understand the overall effects of fosgonimeton on working memory processing speed and cognitive measures, with topline results expected in the first half of 2022. These data will help support strategic decisions around any additional pivotal trials that we may initiate in parallel to the LIFT-AD trial if the results from the ACT-AD P300 Phase 2 clinical trial do not meet our expectations. The topline results of this ACT-AD P300 Phase 2 clinical trial will be based on a preliminary analysis of then-available data, and a more comprehensive and full review of the data may result in different conclusions, which could have a negative impact on our decisions regarding any additional trials for fosgonimeton.

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.

If we experience delays or difficulties in the enrollment and/or retention of patients in clinical trials, our regulatory submissions or receipt of necessary marketing approvals could be delayed or prevented.

We may not be able to initiate or continue clinical trials for our product candidates if we are unable to recruit and enroll a sufficient number of eligible patients to participate in these clinical trials through completion of such trials as required by the FDA or other comparable foreign regulatory authorities. Patient enrollment is a significant factor in the timing of clinical trials. Our ability to enroll eligible patients may be limited or may result in slower enrollment than we anticipate. Patient enrollment may also be affected if our competitors have ongoing clinical trials for programs that are under development for the same indications as our product candidates, and patients who would otherwise be eligible for our clinical trials instead enroll in clinical trials of our competitors' programs. If we are unable to locate a sufficient number of such patients, our clinical trial and development plans could be delayed.

If we are delayed or unsuccessful in enrolling the desired number of subjects in our trials, whether as a result of competing clinical trials, overly stringent eligibility requirements, or the ongoing impact of COVID-19 on both clinical trial sites and potential AD subjects, our clinical trial results could be delayed, the costs of our clinical trials could materially increase, and the overall development timeline for fosgonimeton could be negatively impacted. For example, enrollment in our ongoing clinical trials has been slowed due to the effects of the COVID-19 pandemic, including governmental restrictions imposed in Australia, where certain of our clinical trial sites are located. In our ACT-AD clinical trial, this slowed recruitment resulted in a change in the anticipated timing of top-line results from our Phase 2 ACT-AD clinical trial, which are currently expected by the first half of 2022. We have since completed enrollment in the ACT-AD clinical trial, but we cannot ensure that similar enrollment issues will not occur again in the future. Even if we are successful in enrolling the targeted number of subjects in our trials, the FDA and other regulators may request additional clinical trials with larger numbers of subjects as a condition to any regulatory approval.

Enrollment of patients in our clinical trials may be further delayed or limited as our clinical trial sites limit their onsite staff or temporarily close as a result of the COVID-19 pandemic, including in response to the emergence of any new variants thereof. In addition, patients may not be able to visit clinical trial sites for data collection purposes due to limitations on travel and physical distancing imposed or recommended by federal or state governments or patients' reluctance to visit the clinical trial sites during the pandemic. The drop-out rates in our clinical trials may be increased during the pandemic. Clinical trial patients who become infected with the COVID-19 virus may complicate the clinical trial data, procedures, and analysis. These factors resulting from the COVID-19 pandemic could delay the anticipated readouts from our clinical trials and our regulatory submissions, and increase the costs associated of the clinical trials.

Our inability to enroll a sufficient number of patients for our clinical trials would result in significant delays or may require us to abandon one or more clinical trials altogether. Further, to the extent any of our clinical trial sites fail to comply with the approved study protocol, good clinical practices, or FDA regulations, we may be required to exclude such sites, participants such sites may have enrolled, as well as the data collected by such sites. If any of these events were to occur, or if we are required to exclude any data for any reason, we may be required to recruit more sites or more participants than we initially thought. Enrollment delays or other delays in our clinical trials may result in increased development costs for our product candidates and jeopardize our ability to obtain marketing approval for the sale of our product candidates. Furthermore, even if we are able to enroll a sufficient number of patients for our clinical trials, we may have difficulty maintaining participation in our clinical trials through the treatment and any follow-up periods.

We face significant competition, and if our competitors develop and market technologies or products more rapidly than we do or that are more effective, safer, or less expensive than the product candidates we develop, our commercial opportunities will be negatively impacted.

The biotechnology and pharmaceutical industries utilize rapidly advancing technologies and are characterized by intense competition. While we believe that our scientific knowledge, platform technology and development expertise provide us with competitive advantages, we face competitive pressures from both large and small pharmaceutical companies, emerging biotechnology companies, as well as academic, government and private research institutions. Many of our competitors have access to greater financial resources, market presence, expertise in development, preclinical and clinical testing, manufacturing, commercialization, regulatory approval process, and/or marketing and sales than we do. Our competitors may compete with us in patient recruitment, clinical research organization, and operational resources. As a result, our competitors may discover, develop, license or commercialize products before or more successfully than we do.

Product candidates that we may successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future. Key product features that would affect our ability to effectively compete with other therapeutics include the efficacy, safety and convenience of our products. Our competitors may obtain patent protection or other intellectual property rights that limit our ability to develop or commercialize our product candidates. The availability of reimbursement from government and other third-party payors will also significantly affect the pricing and competitiveness of our products. Our competitors may also obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market. For additional information regarding our competition, see the section titled "Part I, Item 1 – Business—Competition" in this report.

We may expend our limited resources to pursue a particular product candidate or indication and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on research programs, therapeutic platforms and product candidates that we identify for specific indications. As a result, we may forego or delay pursuit of opportunities with other therapeutic platforms or product candidates or for other

indications that later prove to have greater commercial potential or a greater likelihood of success. 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, therapeutic platforms and product candidates for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate 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.

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

We may develop product candidates in combination with one or more other approved or unapproved therapies. Even if any product candidate we develop were 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 comparable foreign regulatory authorities outside of the United States could revoke approval of the therapy used in combination with our product or that safety, efficacy, manufacturing or supply issues could arise with any of those existing therapies. If the therapies we use in combination with our product candidates are replaced as the standard of care for the indications we choose for any of our product candidates, the FDA or comparable foreign regulatory authorities may require us to conduct additional clinical trials. The occurrence of any of these risks could result in our own products, if approved, being removed from the market or being less successful commercially.

We also may choose to evaluate product candidates in combination with one or more therapies that have not yet been approved for marketing by the FDA or comparable foreign regulatory authorities. We will not be able to market and sell any product candidate we develop in combination with an unapproved therapy for a combination indication if that unapproved therapy does not ultimately obtain marketing approval either alone or in combination with our product. In addition, unapproved therapies face the same risks described with respect to our product candidates currently in development and clinical trials, including the potential for serious adverse effects, delay in their clinical trials and lack of FDA approval. If the FDA or comparable foreign regulatory authorities do not approve these other drugs or revoke their approval of, or if safety, efficacy, quality, manufacturing or supply issues arise with, the drugs we choose to evaluate in combination with our product candidate we develop, we may be unable to obtain approval of or market such combination therapy.

Our long-term prospects depend in part upon discovering, developing and commercializing additional product candidates, which may fail in development or suffer delays that adversely affect their commercial viability.

Our future operating results are dependent on our ability to successfully discover, develop, obtain regulatory approval for and commercialize product candidates beyond those we currently have in clinical and nonclinical development. A product candidate can unexpectedly fail at any stage of nonclinical and clinical development. The historical failure rate for product candidates is high due to risks relating to safety, efficacy, clinical execution, changing standards of medical care and other unpredictable variables. The results from nonclinical testing or early clinical trials of a product candidate may not be predictive of the results that will be obtained in later stage clinical trials of the product candidate.

The success of other future product candidates we may develop will depend on many factors, including the following:

- generating sufficient data to support the initiation or continuation of clinical trials;
- obtaining regulatory permission to initiate clinical trials;
- contracting with the necessary parties to conduct clinical trials;

- successful enrollment of patients in, and the completion of, clinical trials on a timely basis;
- the timely manufacture of sufficient quantities of the product candidate for use in clinical trials; and
- adverse events in the clinical trials.

Even if we successfully advance any other future product candidates into clinical development, their success will be subject to all of the clinical, regulatory and commercial risks described elsewhere in this "Risk Factors" section. Accordingly, we cannot assure you that we will ever be able to discover, develop, obtain regulatory approval of, commercialize or generate significant revenue from our other future product candidates.

We conduct certain research and development operations through our Australian wholly owned subsidiary. If we lose our ability to operate in Australia, or if our subsidiary is unable to receive the research and development tax credit allowed by Australian regulations, our business and results of operations could suffer.

In July 2020, we formed a wholly owned Australian subsidiary to conduct various preclinical and clinical activities for our product and development candidates in Australia. Due to the geographical distance and lack of employees currently in Australia, as well as our lack of experience operating in Australia, we may not be able to efficiently or successfully monitor, develop and commercialize our lead products in Australia, including conducting clinical trials. Furthermore, we have no assurance that the results of any clinical trials that we conduct for our product candidates in Australia will be accepted by the FDA or foreign regulatory authorities for development and commercialization approvals.

In addition, current Australian tax regulations provide for a refundable research and development tax credit equal to 43.5% of qualified expenditures. If we lose our ability to operate our subsidiary in Australia, or if we are ineligible or unable to receive the research and development tax credit, or the Australian government significantly reduces or eliminates the tax credit, our business and results of operation may be adversely affected.

The loss of any of our key personnel could significantly harm our business, results of operations and competitive position.

In order to compete, we must attract, retain, and motivate executives and other key employees. Hiring and retaining qualified executives, scientists, technical and legal and accounting staff are critical to our business, and competition for experienced employees in our industry can be intense. The loss of one or more of these key employees, or our inability to hire additional key personnel when needed, could have a material adverse effect on our business and prospects.

In June 2021 our board of directors placed Dr. Leen Kawas, our then chief executive officer, on temporary leave pending a review of papers co-authored by Dr. Kawas in connection with her doctoral research at WSU, among other things. An independent special committee of our board of directors, assisted by independent legal counsel, conducted an investigation of allegations raised regarding doctoral research by Dr. Kawas conducted while at WSU, as well as related matters. The special committee's primary finding was that Dr. Kawas altered images in her 2011 doctoral dissertation and at least four research papers that she co-authored while a graduate student at WSU, and published from 2011 to 2014.

On October 18, 2021, Dr. Kawas submitted her resignation as president and chief executive officer and as a member of our board of directors, effective October 18, 2021. Concurrently with Dr. Kawas's resignation, our board of directors appointed Mark Litton, Ph.D., MBA as president and chief executive officer and as a member of our board of directors. This succession and transition process may have a direct or indirect adverse effect on our business, results of operations, hiring and retention efforts, and competitive position.

Risks Relating to COVID-19 and Other Health Epidemics

The continuing effects of the novel coronavirus disease, or COVID-19, pandemic could adversely impact our business, including our nonclinical studies and clinical trials.

The COVID-19 pandemic and government measures taken in response have had a significant impact, both direct and indirect, on businesses and commerce, as worker shortages have occurred; supply chains have been disrupted; facilities and production have been suspended; and demand for certain goods and services, such as medical services and supplies, has spiked, while demand for other goods and services, such as travel, has fallen. In response to the spread of COVID-19, we temporarily closed our executive offices and limited the number of staff in our research and development laboratory spaces. While at this time our offices and laboratory spaces have been reopened at full capacity, a resurgence in cases of COVID-19 or a similar health epidemic could recur at any time, which may cause us to again close down our facilities or take other measures in response. In particular, new and highly contagious variants of COVID-19 continue to emerge and spread quickly throughout certain areas of the United States and elsewhere, and at this point we are unable to determine when and to what extent any such resurgence will affect our business. In addition, a number of our clinical trial sites have been subject to restrictions related to COVID-19 that have adversely affected their operations. While COVID-19 related restrictions have been eased in many of our clinical trial sites, new restrictions could be imposed at any time, whether in response to an outbreak of a new variant of COVID-19 or any similar outbreak. While the extent of the continuing impact of the COVID-19 pandemic on our business and financial results is uncertain, a resurgence in cases of COVID-19 or similar epidemic could have a material negative impact on our business, financial condition and operating results.

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

- delays or difficulties in enrolling and retaining patients in our clinical trials, particularly elderly subjects, who are at a higher risk of severe illness or death from COVID-19, which can be further complicated by the presence of comorbidities that are often present in AD subjects;
- difficulties interpreting data from our clinical trials due to the possible effects of COVID-19 on cognition of the subjects enrolled in our clinical trials that contract COVID-19;
- delays or difficulties in clinical site initiation, including difficulties in recruiting clinical site investigators and clinical site staff;
- diversion of healthcare resources away from the conduct of clinical trials, including the diversion of hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;
- interruption of key clinical trial activities, such as clinical trial site data monitoring, due to limitations on travel imposed or recommended by federal or state governments, employers and others or interruption of clinical trial subject visits and study procedures (such as endoscopies that are deemed non-essential), which may impact the integrity of subject data and clinical study endpoints;
- interruption or delays in the operations of the FDA or other regulatory authorities, which may impact review and approval timelines;
- interruption of, or delays in receiving, supplies of our product candidates from our contract manufacturing organizations due to staffing shortages, production slowdowns or stoppages and disruptions in delivery systems;
- interruptions in nonclinical studies due to restricted or limited operations at our laboratory facility;
- limitations on employee resources that would otherwise be focused on the conduct of our nonclinical studies and clinical trials, including because of sickness of employees or their families or the desire of employees to avoid contact with large groups of people;

- interruptions, difficulties or delays arising in our existing operations and company culture as a result of all of our employees working remotely, including those hired during the COVID-19 pandemic;
- interruption or delays to our sourced discovery and clinical activities; and
- changes in clinical site procedures and requirements as well as regulatory requirements for conducting clinical trials during the pandemic.

We may be required to develop and implement additional clinical trial policies and procedures designed to help protect subjects from the COVID-19 virus. For example, in March 2020, the FDA issued a guidance, which the FDA subsequently updated, on conducting clinical trials during the pandemic, which describes a number of considerations for sponsors of clinical trials impacted by the pandemic, including the requirement to include in the clinical trial report contingency measures implemented to manage the clinical trial, and any disruption of the clinical trial as a result of the COVID-19 pandemic; a list of all subjects affected by the COVID-19-pandemic related study disruption by unique subject identifier and by investigational site and a description of how the individual's participation was altered; and analyses and corresponding discussions that address the impact of implemented contingency measures (e.g., participant discontinuation from investigational product and/or study, alternative procedures used to collect critical safety and/or efficacy data) on the safety and efficacy results reported for the clinical trial. In June 2020, the FDA also issued a guidance on good manufacturing practice considerations for responding to COVID-19 infection in employees in drug products manufacturing, including recommendations for manufacturing controls to prevent contamination of drugs.

The trading prices for shares of other biopharmaceutical companies have been highly volatile as a result of the COVID-19 pandemic and the trading prices for shares of our common stock could also experience high volatility. As a result, we may face difficulties raising capital through sales of our common stock or such sales may be on unfavorable terms. In addition, a recession, depression or other sustained adverse market event resulting from the spread of COVID-19 could materially and adversely affect our business and the value of our common stock.

The ultimate impact of the COVID-19 pandemic on our business operations is highly uncertain and subject to change and will depend on future developments, which cannot be accurately predicted, including the duration of the pandemic, the ultimate geographic spread of the disease, additional or modified government actions, new information that will emerge concerning the severity and impact of COVID-19 and the actions taken to contain COVID-19 or address its impact in the short and long term, among others. We do not yet know the full extent of potential delays or impacts on our business, our clinical trials, our research programs, healthcare systems or the global economy. We will continue to monitor the situation closely.

In addition, our business could be significantly adversely affected by other business disruptions to us or our third-party providers that could seriously harm our potential future revenue and financial condition and increase our costs and expenses. Our operations, and those of our CROs, commercial manufacturing organizations, or CMOs, and other contractors, consultants, and third parties could be subject to other global pandemics, earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or man-made disasters or business interruptions, for which we are predominantly self-insured. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses. We rely on third-party manufacturers to produce and process our product candidates. Our ability to obtain clinical supplies of our product candidates could be disrupted if the operations of these suppliers are affected by a man-made or natural disaster or other business interruption.

Risks Relating to Our Financial Position and Capital Needs

We have incurred significant losses since our inception and anticipate that we will continue to incur significant losses for the foreseeable future.

We have not generated any revenue from product sales and our product candidates will require substantial additional investment before they may provide us with any revenue. We had net losses of $54.9 million and $19.9 million for the years ended December 31, 2021 and 2020, respectively, and an accumulated deficit of $95.9 million as of December 31, 2021.

We have devoted most of our financial resources to research and development, including our clinical and nonclinical development activities. To date, we have financed our operations primarily with proceeds from the sale and issuance of common stock, convertible preferred stock, common stock warrants, and convertible notes, and to a lesser extent from grant income and stock option exercises.

We expect to incur significant expenses and increasing operating losses for the foreseeable future as we:

- continue our research and nonclinical and clinical development of our product candidates;
- expand the scope of our clinical studies for our current and prospective product candidates;
- initiate additional nonclinical, clinical or other studies for our product candidates, including any pivotal trials with respect to fosgonimeton for the treatment of mild-to-moderate AD in addition to LIFT-AD, or potentially further extend the open label extension of the ACT-AD and LIFT-AD trials;
- change or add additional manufacturers or suppliers and manufacture drug supply and drug product for clinical trials and commercialization;
- seek regulatory and marketing approvals for any of our product candidates that successfully complete clinical trials;
- attract, hire and retain additional personnel;
- operate as a public company;
- continue to expand our facilities and lab space;
- seek to identify and validate additional product candidates;
- acquire or in-license other product candidates and technologies;
- make milestone or other payments under our in-license or other agreements;
- maintain, protect and expand our intellectual property portfolio;
- establish a sales, marketing and distribution infrastructure to commercialize any products for which we may obtain marketing approval;
- create additional infrastructure to support our operations and our product development and planned future commercialization efforts;
- incur expenses in connection with legal proceedings, or addressing stockholder activism; and
- experience any delays or encounter issues with any of the above.

Our expenses could increase beyond expectations for a variety of reasons, including if we are required by the FDA, the European Medicines Agency, or EMA, or other regulatory agencies, domestic or foreign, to perform clinical and other studies in addition to those that we currently anticipate. Our prior losses,

combined with expected future losses, have had and will continue to have an adverse effect on our stockholders' equity.

We will require substantial additional funding to finance our operations, complete the development and commercialization of fosgonimeton, and evaluate other and future product candidates. If we are unable to raise this funding when needed, we may be forced to delay, reduce, or eliminate our product development programs or other operations.

Since our inception, we have used substantial amounts of cash to fund our operations, and we expect our expenses to increase substantially in the foreseeable future in connection with our ongoing activities, particularly as we continue the research and development of, initiate clinical trials of, and seek marketing approval for, fosgonimeton. Developing fosgonimeton and conducting clinical trials for the treatment of AD, PDD, and any other indications that we may pursue in the future will require substantial amounts of capital. In addition, if we obtain marketing approval for fosgonimeton or any future product candidates, we expect to incur significant commercialization expenses related to sales, marketing, manufacturing, and distribution. Furthermore, we expect to continue to incur additional costs associated with operating as a public company.

Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. As of December 31, 2021, we had cash, cash equivalents, and investments of $319.7 million. Based upon our current operating plan, we estimate that our existing cash, cash equivalents, and investments will be sufficient to fund our operating expenses and capital expenditure requirements at least through 2022. However, changing circumstances may cause us to increase our spending significantly faster than we currently anticipate, and we may need to spend more money than currently expected because of circumstances beyond our control. We may need to raise additional funds sooner than we anticipate if we choose to expand more rapidly than we presently anticipate.

The amount and timing of our future funding requirements depends on many factors, some of which are outside of our control, including but not limited to:

- the progress, costs, clinical trial design, results of and timing of our LIFT-AD trial and other clinical trials of fosgonimeton, including for potential additional indications that we are pursuing beyond AD, such as PDD, and a potential further extension of the open label extension of the ACT-AD and LIFT-AD trials;
- the willingness of the FDA and EMA to accept our LIFT-AD trial, as well as data from our completed and planned clinical and nonclinical studies and other work, as the basis for review and approval of fosgonimeton for AD;
- the outcome, costs and timing of seeking and obtaining FDA, EMA and any other regulatory approvals;
- the number and characteristics of product candidates that we pursue;
- our ability to manufacture sufficient quantities of our product candidates;
- our need to expand our research and development activities;
- the costs associated with securing and establishing commercialization and manufacturing capabilities;
- the costs of acquiring, licensing or investing in businesses, product candidates and technologies;
- the cost, timing and outcomes of any litigation involving our company, including securities class actions and government investigations which we may be or may in the future become involved in;
- our ability to maintain, expand and defend the scope of our intellectual property portfolio, including the amount and timing of any payments we may be required to make, or that we may

receive, in connection with the licensing, filing, prosecution, defense and enforcement of any patents or other intellectual property rights;

- our need and ability to retain management and hire scientific, clinical and other personnel;
- the effect of competing drugs and product candidates and other market developments;
- our need to implement additional internal systems and infrastructure, including financial and reporting systems; and
- the economic and other terms, timing of and success of any collaboration, licensing or other arrangements into which we may enter in the future.

Additional funding may not be available to us on acceptable terms or at all. Any such funding may result in dilution to stockholders, imposition of debt covenants and repayment obligations, or other restrictions that may affect our business. If we are unable to obtain funding on a timely basis, we may be required to significantly curtail one or more of our research or development programs. We also could be required to seek funds through arrangements with collaborative partners or otherwise that may require us to relinquish rights to some of our technologies or product candidates or otherwise agree to terms unfavorable to us.

Our ability to use net operating losses to offset future taxable income may be subject to certain limitations.

As of December 31, 2021, we had federal net operating loss carryforwards, or NOLs, to offset future taxable income of approximately $9.5 million and federal tax credit carryforwards of approximately $2.9 million. The federal NOLs generated during and after fiscal 2017 totaling $80.7 million are carried forward indefinitely, while all others, if not utilized, will expire in various years beginning in 2025. A lack of future taxable income would adversely affect our ability to utilize these NOLs. In addition, under Section 382 of the Internal Revenue Code of 1986, as amended, or the Code, a corporation that undergoes an “ownership change” is subject to limitations on its ability to utilize its NOLs to offset future taxable income. We may have already experienced one or more ownership changes. Depending on the timing of any future utilization of our NOLs and tax credit carryforwards, we may be limited as to the amount that can be utilized each year as a result of such previous ownership changes. However, we do not believe such limitations will cause our NOL and tax credit carryforwards to expire unutilized. In addition, future changes in our stock ownership as well as other changes that may be outside of our control, could result in additional ownership changes under Section 382 of the Code. Our NOLs may also be impaired under similar provisions of state law or limited pursuant to provisions of the Tax Cuts and Jobs Act amendments to the Code, as modified by the Coronavirus Aid, Relief, and Economic Security Act. We have recorded a full valuation allowance related to our NOLs and other deferred tax assets due to the uncertainty of the ultimate realization of the future benefits of those assets.

Risks Relating to Regulatory Approval and Other Legal Compliance Matters

The regulatory approval processes of the FDA and other comparable foreign regulatory authorities are lengthy, time consuming and inherently unpredictable. If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals for our product candidates, we will not be able to commercialize, or will be delayed in commercializing, our product candidates, and our ability to generate revenue will be materially impaired.

Our product candidates and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale, distribution, import and export are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by comparable foreign regulatory authorities. Before we can commercialize any of our product candidates, we must obtain marketing approval.

Obtaining approval by the FDA and other 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. Further, securing regulatory approval also requires the submission of information about the drug manufacturing process to, and inspection of manufacturing facilities by, the relevant regulatory authority. 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 nonclinical, clinical or other data. Even if we eventually complete clinical testing and receive approval for our product candidates, the FDA and other comparable foreign regulatory authorities may approve our product candidates for a more limited indication or a narrower patient population than we originally requested or may impose other prescribing limitations or warnings that limit the product's commercial potential. We have not submitted for, or obtained, regulatory approval for any product candidate, and it is possible that none of our product candidates will ever obtain regulatory approval. Further, development of our product candidates and/or regulatory approval may be delayed for reasons beyond our control.

Applications for our product candidates could fail to receive regulatory approval for many reasons, including the following:

- the FDA or other comparable foreign regulatory authorities may disagree with the design, implementation or results of our clinical trials;
- the FDA or other comparable foreign regulatory authorities may determine that our product candidates are not safe and effective or have undesirable or unintended side effects, toxicities or other characteristics that preclude our obtaining marketing approval or prevent or limit commercial use;
- the population studied in the clinical trial may not be sufficiently broad or representative to assure efficacy and safety in the full population for which we seek approval;
- the FDA or other comparable foreign regulatory authorities may disagree with our interpretation of data from nonclinical studies or clinical trials;
- we may be unable to demonstrate to the FDA or other comparable foreign regulatory authorities that our product candidate's risk-benefit ratio for its proposed indication is acceptable;
- the FDA or other 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 other comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval or resulting in delays in our regulatory approval, including, for example, in connection with the recent controversy and ongoing government investigation of the FDA's approval process for Biogen's AD biologic drug Aduhelm.

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 significantly harm our business, results of operations and prospects. In addition, even if we obtain approval of our product candidates, 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 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.

Of the large number of drugs in development, only a small percentage successfully complete the FDA or comparable foreign regulatory approval processes and are commercialized. The lengthy approval processes as well as the unpredictability of future clinical trial results may result in our failing to obtain regulatory approval to market our product candidates, which would significantly harm our business, results of operations and prospects.

Our current or future product candidates may cause significant adverse events, toxicities or other undesirable side effects when used alone or in combination with other approved products or investigational new drugs that may result in a safety profile that could inhibit regulatory approval, prevent market acceptance, limit their commercial potential or result in significant negative consequences.

As is the case with pharmaceuticals generally, it is likely that there may be side effects and adverse events associated with our product candidates' use. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects or unexpected characteristics. Undesirable side effects caused by our product candidates could cause us 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 comparable foreign regulatory authorities. The drug-related side effects could affect patient recruitment or the ability of enrolled patients to complete the clinical trial or result in potential product liability claims. Any of these occurrences may harm our business, financial condition and prospects significantly.

If our product candidates are associated with undesirable side effects or have unexpected characteristics in nonclinical studies or clinical trials when used alone or in combination with other approved products or investigational new drugs we may need to interrupt, delay or abandon their development or limit development to more narrow uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective. Treatment-related side effects could also affect patient recruitment or the ability of enrolled subjects to complete the clinical trial, or result in potential product liability claims. Any of these occurrences may prevent us from achieving or maintaining market acceptance of the affected product candidate and may harm our business, financial condition and prospects significantly.

Patients in our clinical trials may in the future suffer significant adverse events or other side effects not observed in our nonclinical studies or previous clinical trials. Some of our product candidates may be used as chronic therapies or be used in populations for which safety concerns may be particularly scrutinized by regulatory agencies. In addition, if our product candidates are used in combination with other therapies, our product candidates may exacerbate adverse events associated with the therapy. Patients treated with our product candidates may also be undergoing separate treatments which can cause side effects or adverse events that are unrelated to our product candidate, but may still impact the success of our clinical trials. The inclusion of elderly patients in our clinical trials may result in deaths or other adverse medical events due to other therapies or medications that such patients may be using. If significant adverse events or other side effects are observed in any of our current or future clinical trials, we may have difficulty recruiting patients to the clinical trials, patients may drop out of our clinical trials, or we may be required to abandon the clinical trials or our development efforts of that product candidate altogether. We, the FDA other comparable regulatory authorities or an IRB may suspend clinical trials of a product candidate at any time for various reasons, including a belief that subjects in such clinical trials are being exposed to unacceptable health risks or adverse side effects. Some potential therapeutics developed in the biotechnology industry that initially showed therapeutic promise in early-stage clinical trials have later been found to cause side effects that prevented their further development. Even if the side effects do not preclude the product candidate from obtaining or maintaining marketing approval, undesirable side effects may inhibit market acceptance due to its tolerability versus other therapies. Any of these developments could materially harm our business, financial condition and prospects.

Further, if any of our product candidates obtains marketing approval, toxicities associated with such product candidates and not seen during clinical testing may also develop after such approval and lead to a requirement to conduct additional clinical safety trials, additional contraindications, warnings and precautions being added to the drug label, significant restrictions on the use of the product or the withdrawal of the product from the market. We cannot predict whether our product candidates will cause toxicities in humans that would preclude or lead to the revocation of regulatory approval based on nonclinical studies or early-stage clinical trials.

Obtaining and maintaining regulatory approval of our product candidates in one jurisdiction does not mean that we will be successful in obtaining regulatory approval of our product candidates in other jurisdictions.

Obtaining and maintaining regulatory approval of our product candidates in one jurisdiction does not guarantee that we will be able to obtain or maintain regulatory approval in any other jurisdiction. For example, even if the FDA grants marketing approval of a product candidate, comparable regulatory authorities in foreign jurisdictions must also approve the manufacturing, marketing and promotion and reimbursement of the product candidate in those countries. However, a failure or delay in obtaining regulatory approval in one jurisdiction may have a negative effect on the regulatory approval process in others. Approval procedures vary among jurisdictions and can involve requirements and administrative review periods different from those in the United States, including additional nonclinical studies or clinical trials as clinical trials conducted in one jurisdiction may not be accepted by regulatory authorities in other jurisdictions. In many jurisdictions outside the United States, a product candidate must be approved for reimbursement before it can be approved for sale in that jurisdiction. In some cases, the price that we intend to charge for our products is also subject to approval.

We may also submit marketing applications in other countries. Regulatory authorities in jurisdictions outside of the United States have requirements for approval of product candidates with which we must comply prior to marketing in those jurisdictions. Obtaining foreign regulatory approvals and establishing and maintaining compliance with foreign regulatory requirements could result in significant delays, difficulties and costs for us and could delay or prevent the introduction of our products in certain countries. If we or any future collaborator fail to comply with the regulatory requirements in international markets or fail to receive applicable marketing approvals, our target market will be reduced and our ability to realize the full market potential of our potential product candidates will be harmed.

Even if we receive regulatory approval of our product candidates, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense and we may be subject to penalties if we fail to comply with regulatory requirements or experience unanticipated problems with our product candidates.

Any regulatory approvals that we receive for our product candidates will require surveillance to monitor the safety and efficacy of the product candidate. The FDA may also require a REMS in order to approve our product candidates, which could entail requirements for a medication guide, physician communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. In addition, if the FDA or a comparable foreign regulatory authority approves our product candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion, import, export and recordkeeping for our product candidates will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with current good manufacturing practice, or cGMP regulations, good laboratory practice, or GLP, regulations and good clinical practice, or GCP regulations, for any clinical trials that we conduct post-approval. Later discovery of previously unknown problems with our product candidates, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of our product candidates, withdrawal of the product from the market or voluntary or mandatory product recalls;
- manufacturing delays and supply disruptions where regulatory inspections identify observations of noncompliance requiring remediation;
- revisions to the labeling, including limitation on approved uses or the addition of additional warnings, contraindications or other safety information, including boxed warnings;
- imposition of a REMS, which may include distribution or use restrictions;

- requirements to conduct additional post-market clinical trials to assess the safety of the product;
- fines, warning letters or holds on clinical trials;
- refusal by the FDA to approve pending applications or supplements to approved applications filed by us or suspension or revocation of approvals;
- product seizure or detention, or refusal to permit the import or export of our product candidates; and
- injunctions or the imposition of civil or criminal penalties.

The FDA's and other regulatory authorities' policies may change, and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. 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. We also 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. It is difficult to predict how current and future legislation, executive actions, and litigation, including the executive orders, will be implemented, and the extent to which they will impact our business, our clinical development, and the FDA's and other agencies' ability to exercise their regulatory authority, including FDA's pre-approval inspections and timely review of any regulatory filings or applications we submit to the FDA. To the extent any executive actions impose constraints on FDA's ability to engage in oversight and implementation activities in the normal course, our business may be negatively impacted.

Moreover, the FDA strictly regulates the promotional claims that may be made about drug products. In particular, a product may not be promoted for uses that are not approved by the FDA as reflected in the product's approved labeling. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant civil, criminal and administrative penalties. The occurrence of any event or penalty described above may inhibit our ability to commercialize our product candidates and generate revenue and could require us to expend significant time and resources in response and could generate negative publicity.

Disruptions at the FDA, the Securities and Exchange Commission and other government agencies caused by funding shortages or global health concerns could hinder their ability to hire and retain 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, or otherwise prevent those agencies from performing normal business functions on which the operation of our business may rely, which could negatively impact our business.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels, ability to hire and retain key personnel and accept the payment of user fees, and statutory, regulatory, and policy changes, and other events that may otherwise affect the FDA's ability to perform routine functions. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of the Securities and Exchange Commission, or the SEC, and other government agencies on which our operations may rely, including those 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, in recent years, including in 2018 and 2019, the U.S. government shut down several times and certain regulatory agencies, such as the FDA and the SEC, had to furlough critical employees and stop critical activities. Separately, in response to the COVID-19 public health emergency, since March 2020 when foreign and domestic inspections facilities were largely placed on hold, the FDA has been working to

resume routine surveillance, bioresearch monitoring and pre-approval inspections on a prioritized basis. The FDA has developed a rating system to assist in determining when and where it is safest to conduct prioritized domestic inspections. In 2020 and 2021, a number of companies announced receipt of complete response letters due to the FDA's inability to complete required inspections for their applications. As of May 2021, the FDA noted it was continuing to ensure timely reviews of applications for medical products during the ongoing COVID-19 pandemic in line with its user fee performance goals and conducting mission critical domestic and foreign inspections to ensure compliance of manufacturing facilities with FDA Good Manufacturing Practices. However, the FDA may not be able to continue its current inspection pace, and review timelines could be extended, including where a pre-approval inspection or an inspection of clinical sites is required and due to the ongoing COVID-19 pandemic and travel restrictions, the FDA is unable to complete such required inspections during the review period. Regulatory authorities outside the U.S. may adopt similar restrictions or other policy measures in response to the COVID-19 pandemic and may experience delays in their regulatory activities. If a prolonged government shutdown or other disruption occurs, or if global health or other concerns continue to prevent the FDA or other regulatory authorities from conducting their regular inspections, reviews, or other regulatory activities in a timely manner, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business. Further, future government shutdowns or delays could impact our ability to access the public markets and obtain necessary capital in order to properly capitalize and continue our operations.

We may attempt to secure approval from the FDA or comparable foreign regulatory authorities through the use of accelerated approval pathways. If we are unable to obtain such approval, we may be required to conduct additional nonclinical 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 postmarketing requirements, the FDA may seek to withdraw accelerated approval.

We may in the future seek an accelerated approval for our one or more of our product candidates. Under the accelerated approval program, the FDA may grant accelerated approval to a product candidate designed to treat a serious or life-threatening condition that provides meaningful therapeutic benefit 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 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 such post-approval studies fail to confirm the drug's clinical benefit, the FDA may withdraw its approval of the drug.

Prior to seeking accelerated approval for any of our product candidates, we intend to seek feedback from the FDA and will otherwise evaluate our ability to seek and receive accelerated approval. There can be no assurance that after our evaluation of the feedback and other factors we will decide to pursue or submit an NDA for accelerated approval or any other form of expedited development, review or approval. Similarly, there can be no assurance that after subsequent FDA feedback we will continue to pursue or apply for accelerated approval or any other form of expedited development, review or approval, even if we initially decide to do so. Furthermore, if we decide to submit an application for accelerated approval or receive an expedited regulatory designation (e.g., breakthrough therapy 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. The FDA or other comparable foreign regulatory authorities could also require us to conduct further studies prior to considering our application or granting approval of any type. A failure to obtain accelerated approval or any other form of expedited development, review or approval for our product candidate would result in a longer

time period to commercialization of such product candidate, could increase the cost of development of such product candidate and could harm our competitive position in the marketplace.

Further, to the extent the FDA materially changes its policies or regulatory requirements with respect to the accelerated approval program or its internal review process for such program, our clinical development plans and regulatory approval under such program could be materially impacted or delayed. In view of the recent controversy regarding the FDA's approval of Biogen's Aduhelm, a biologic, through the accelerated approval pathway, the FDA has requested the Office of the Inspector General to investigate the FDA's review of Aduhelm leading up to its approval. It is unclear how this investigation will generally impact the FDA's review process, policies, and data requirements for the accelerated approval program in the future or specifically impact new drug applications in the treatment of Alzheimer's disease and our clinical development programs.

We may face difficulties from changes to current regulations and future legislation. Healthcare legislative measures aimed at reducing healthcare costs may have a material adverse effect on our business and results of operations.

The United States and many foreign jurisdictions have enacted or proposed legislative and regulatory changes affecting the healthcare system that could prevent or delay marketing approval of our product candidates or any future product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell a product for which we obtain marketing approval. Changes in regulations, statutes or the interpretation of existing regulations could impact our business in the future by requiring, for example:

- changes to our manufacturing arrangements;
- additions or modifications to product labeling;
- the recall or discontinuation of our products; or
- additional record-keeping requirements. If any such changes were to be imposed, they could adversely affect the operation of our business.

In the United States, there have been and continue to be a number of legislative initiatives to contain healthcare costs. For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively, ACA, was passed, which substantially changed the way healthcare is financed by both governmental and private insurers, and significantly impacted the U.S. pharmaceutical industry. The ACA contained provisions that may reduce the profitability of drug products through increased rebates for drugs reimbursed by Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. The Medicaid Drug Rebate Program requires pharmaceutical manufacturers to enter into and have in effect a national rebate agreement with the U.S. Department of Health and Human Services Secretary, or HHS Secretary, as a condition for states to receive federal matching funds for the manufacturer's outpatient drugs furnished to Medicaid patients. The ACA made several changes to the Medicaid Drug Rebate Program, including increasing the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program, extending the rebate program to individuals enrolled in Medicaid managed care organizations. The ACA also established annual fees and taxes on manufacturers of certain branded prescription drugs, and created a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 70% (increased pursuant to the Bipartisan Budget Act of 2018, effective as of 2019) 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. In December 2020, the U.S. Centers for Medicare & Medicaid Services (CMS) issued a final rule implementing significant manufacturer price reporting changes under the Medicaid Drug Rebate Program, including regulations that affect manufacturer-sponsored patient assistance programs subject to pharmacy benefit manager accumulator programs and Best Price reporting related to certain value-based purchasing arrangements. Under the American Rescue Plan Act of 2021, effective January 1, 2024, the statutory cap on Medicaid Drug Rebate Program rebates that manufacturers pay to state Medicaid programs will be eliminated. Elimination of this cap may require

pharmaceutical manufacturers to pay more in rebates than it receives on the sale of products, which could have a material impact on our business.

As discussed above, since its enactment, there have been judicial and Congressional challenges to certain aspects of the ACA. On January 28, 2021, President Biden issued an executive order to initiate a special enrollment period for purposes of obtaining health insurance coverage through the ACA marketplace, which also instructs certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare. In June 2021, the United States Supreme Court held that Texas and other challengers had no legal standing to challenge the ACA, dismissing the case without specifically ruling on the constitutionality of the ACA. We cannot predict how this Supreme Court decision or future litigation will impact our business, or what other healthcare measures and regulations will ultimately be implemented at the federal or state level or the effect of any future legislation or regulation may have on our business. Complying with any new legislation and regulatory requirements could be time-intensive and expensive, resulting in a material adverse effect on our business.

The Bipartisan Budget Act of 2018 also amended the ACA, effective January 1, 2019, by increasing the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D and closing the coverage gap in most Medicare drug plans, commonly referred to as the “donut hole.” CMS published a final rule permitting further collections and payments to and from certain ACA qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. In addition, CMS has published a final rule to give states greater flexibility, starting in 2020, in setting benchmarks for insurers in the individual and small group marketplaces, which may have the effect of relaxing the essential health benefits required under the ACA for plans sold through such marketplaces. The American Taxpayer Relief Act of 2012, or ATRA, 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. Other legislative changes include aggregate reductions to Medicare payments to providers of up to 2% per fiscal year pursuant to the Budget Control Act of 2011, which began in 2013 and will remain in effect through 2031 with the exception of a temporary suspension implemented under various COVID-19 relief legislation from May 1, 2020 through March 31, 2022, unless additional Congressional action is taken. Under current legislation, the actual reduction in Medicare payments will vary from 1% in 2022 to up to 3% in the final fiscal year of this sequester.

There has been increasing legislative and enforcement interest in the United States with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries and proposed federal and state legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under Medicare, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. At the federal level, the Trump administration used several means to propose or implement drug pricing reform, including through federal budget proposals, executive orders and policy initiatives. For example, in 2020, HHS and CMS issued various rules that are expected to impact, among others, price reductions from pharmaceutical manufacturers to plan sponsors under Part D, fee arrangements between pharmacy benefit managers and manufacturers, manufacturer price reporting requirements under the Medicaid Drug Rebate Program, including regulations that affect manufacturer-sponsored patient assistance programs subject to pharmacy benefit manager accumulator programs and Best Price reporting related to certain value-based purchasing arrangements. Multiple lawsuits have been brought against the HHS challenging various aspects of the rules implemented during the Trump administration. As a result, the Biden administration and HHS have delayed the implementation or published rules rescinding some of these Trump-era policies.

In July 2021, the Biden administration released an executive order, “Promoting Competition in the American Economy,” with multiple provisions aimed at increasing competition for prescription drugs. In response to this executive order, the HHS released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and potential legislative policies that Congress could pursue to advance these principles. In addition, Congress is considering legislation that, if passed, could have

significant impact on prices of prescription drugs covered by Medicare, including limitations on drug price increases. The impact of these legislative, executive, and administrative actions and any future healthcare measures and agency rules implemented by the Biden administration on us and the pharmaceutical industry as a whole is unclear. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability, or commercialize our product candidates if approved.

Further, CMS recently released a draft National Coverage Determination (NCD) decision memorandum that proposes covering FDA-approved monoclonal antibodies that target amyloid for the treatment of Alzheimer's disease through coverage with evidence development, which means that FDA-approved drugs in this class would be covered by Medicare only if the patients are enrolled in qualifying clinical trials. Currently, Aduhelm is the only monoclonal antibody directed against amyloid beta approved by the FDA for the treatment of Alzheimer's disease and potentially subject to this NCD if finalized by CMS. If CMS adopts similar coverage restrictions for other classes of FDA-approved drugs for the treatment of Alzheimer's disease that encompass our product candidates, our ability to commercialize our product candidates, if approved, generate revenue and attain profitability could be negatively impacted. It is unclear how future CMS coverage decisions and policies will impact our business.

At the state level, individual states are increasingly aggressive in passing legislation and implementing 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. In addition, regional health care 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 health care programs. These measures could reduce the ultimate demand for our products, once approved, or put pressure on our product pricing. A number of states are considering or have recently enacted state drug price transparency and reporting laws that could substantially increase our compliance burdens and expose us to greater liability under such state laws once we begin commercialization after obtaining regulatory approval for any of our products. We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our product candidates or additional pricing pressures.

Our revenue prospects could be affected by changes in healthcare spending and policy in the United States and abroad. We operate in a highly regulated industry and new laws, regulations or judicial decisions, or new interpretations of existing laws, regulations or decisions, related to healthcare availability, the method of delivery or payment for healthcare products and services could negatively impact our business, operations and financial condition.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare. We cannot predict the initiatives that may be adopted in the future, including repeal, replacement or significant revisions to the ACA. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare and/or impose price controls may adversely affect:

- the demand for our product candidates, if we obtain regulatory approval;
- our ability to set a price that we believe is fair for our products;
- our ability to obtain coverage and reimbursement approval for a product;
- our ability to generate revenue and achieve or maintain profitability;
- the level of taxes that we are required to pay; and
- the availability of capital.

Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors, which may adversely affect our future profitability.

We expect that the ACA, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we receive for any approved product. Further, it is possible that additional governmental action is taken to address the COVID-19 pandemic. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our product candidates. Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for biotechnology products. We cannot be sure to what extent the trajectory of these legislative and regulatory proposals will be implemented by the federal and state governments, whether additional legislative changes will be enacted, whether FDA 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.

Our relationships with healthcare professionals, clinical investigators, CROs and third party payors in connection with our current and future business activities, and our participation in the federal health care programs and acceptance of federal grant funding, such as funding from the National Institutes of Health (NIH), may be subject to federal and state healthcare fraud and abuse laws, false claims laws, transparency laws, government price reporting, and health information privacy and security laws, which could expose us to, among other things, criminal sanctions, civil penalties, contractual damages, exclusion from governmental healthcare programs, reputational harm, administrative burdens and diminished profits and future earnings.

Healthcare providers and third-party payors play a primary role in the recommendation and prescription of any product candidates for which we obtain marketing approval. Our current and future arrangements with healthcare professionals, clinical investigators, CROs, third-party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we market, sell and distribute our products for which we obtain marketing approval. Similarly, our participation in the federal health care programs and acceptance of federal grant funding from the NIH may subject us to federal false claims laws, civil penalties and assessments, criminal prosecution, and other administrative, civil, and criminal remedies.

The laws that may affect our ability to operate include, but are not limited to:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe, or rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce, or in return for, either the referral of an individual, 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 a federal healthcare program, such as the Medicare and Medicaid programs. 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. Violations are subject to civil and criminal fines and penalties for each violation, plus up to three times the remuneration involved, imprisonment, and exclusion from government healthcare programs. 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 False Claims Act, or FCA. There are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution, but the exceptions and safe harbors are drawn narrowly and require strict compliance in order to offer protection.

- federal civil and criminal false claims laws, including the FCA, which can be enforced through civil “qui tam” or “whistleblower” actions, and civil monetary penalty laws, impose criminal and civil penalties against individuals or entities for, among other things, knowingly presenting, or causing to be presented, claims for payment or approval from Medicare, Medicaid, or other federal health care programs that are false or fraudulent; knowingly making or causing a false statement material to a false or fraudulent claim or an obligation to pay money to the federal government; or knowingly concealing or knowingly and improperly avoiding or decreasing such an obligation. 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 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 federal civil 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. Under the FCA, a “claim” also includes any request (including grant request) or demand for money or property made to the United States or to a contractor, recipient, if the Federal government provides or will reimburse any portion of the funds claimed. “Funds” include money that the NIH awards as part of research grants. Even if a federal grant is not awarded, the grant applicant may be subject to FCA liability if the information contained in or submitted as part of a grant application, including its certifications and assurances, is found to be false, fictitious, or fraudulent.
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created new 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 federal Anti-Kickback Statute, a person or entity can be found guilty of violating HIPAA without actual knowledge of the statute or specific intent to violate it.
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their respective implementing regulations, which impose requirements on certain covered healthcare providers, health plans, and healthcare clearinghouses as well as their respective business associates and their subcontractors that perform services for them that involve the use, or disclosure of, individually identifiable health information, relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys’ fees and costs associated with pursuing federal civil actions.

- the federal Physician Payments Sunshine Act, created under the ACA and its implementing regulations, which require manufacturers of drugs, devices, biologicals and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to CMS information related to payments or other transfers of value made to covered recipients, including physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), certain non-physician healthcare professionals (such as physician assistants and nurse practitioners, among others), and teaching hospitals, as well as information regarding ownership and investment interests held by physicians and their immediate family members.
- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers.
- analogous state and foreign laws and regulations, such as state and foreign anti-kickback, false claims, consumer protection and unfair competition laws which may apply to pharmaceutical business practices, including but not limited to, research, distribution, sales and marketing arrangements as well as submitting claims involving healthcare items or services reimbursed by any third-party payor, including commercial 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 federal government that otherwise restricts payments that may be made to healthcare providers and other potential referral sources; state laws that require drug manufacturers to file reports with states regarding pricing and marketing information, such as the tracking and reporting of gifts, compensations and other remuneration and items of value provided to healthcare professionals and entities; state and local laws requiring the registration of pharmaceutical sales representatives; and state and foreign laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts.

Because of the breadth of these laws and the narrowness of available statutory exceptions and regulatory safe harbors, it is possible that some of our business activities, including our advisory board arrangements with physicians, some of whom receive stock or stock options as compensation for services provided, and any sales and marketing activities after a product candidate has been approved for marketing in the United States, could be subject to legal challenge and enforcement actions. If our operations are found to be in violation of any of the federal and state laws described above or any other governmental regulations that apply to us, we may be subject to significant civil, criminal, and administrative penalties, including, without limitation, damages, fines, imprisonment, exclusion from participation in government healthcare programs, additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws, and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

Our employees, independent contractors, consultants, commercial collaborators, principal investigators, CROs, suppliers and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

In addition to the risks relating to the outcome of the independent special committee's investigation noted above, we are exposed to the risk that our employees, independent contractors, consultants, commercial collaborators, principal investigators, CROs, suppliers and vendors may engage in misconduct or other improper activities. Misconduct by these parties could include failures to comply with FDA regulations, provide accurate information to the FDA, comply with federal and state health care fraud and abuse laws and regulations, accurately report financial information or data or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the health care 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. Misconduct by these parties could also involve the improper use of information obtained in

the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter misconduct by these 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 these laws or regulations. 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, including the imposition of significant penalties, including civil, criminal and administrative penalties, damages, fines, disgorgement, imprisonment, exclusion from participation in government funded healthcare programs, such as Medicare and Medicaid, integrity oversight and reporting obligations, contractual damages, reputational harm, diminished profits and future earnings and the curtailment or restructuring of our operations.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological and radioactive materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties. Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or commercialization efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

We are subject to certain U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations. We can face serious consequences for violations.

Among other matters, U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations, which are collectively referred to as Trade Laws, prohibit companies and their employees, agents, clinical research organizations, legal counsel, accountants, consultants, contractors, and other partners from authorizing, promising, offering, providing, soliciting, or receiving directly or indirectly, corrupt or improper payments or anything else of value to or from recipients in the public or private sector. Violations of trade laws can result in substantial criminal fines and civil penalties, imprisonment, the loss of trade privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We also expect our non-U.S. activities to increase in time. We plan to engage third parties for clinical trials and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals and we can be held liable for the corrupt or other illegal activities of our personnel, agents, or partners, even if we do not explicitly authorize or have prior knowledge of such activities.

Risks Relating to Our Reliance on Third Parties

We rely on third parties to conduct our nonclinical studies and clinical trials. If these third parties do not properly and successfully carry out their contractual duties or meet expected deadlines, we may not be able to obtain regulatory approval of or commercialize our product candidates.

We utilize and depend upon independent investigators and collaborators, such as medical institutions, CROs, CMOs, and strategic partners to conduct and support our nonclinical studies and clinical trials under agreements with us.

We expect to have to negotiate budgets and contracts with CROs, clinical trial sites and CMOs and we may not be able to do so on favorable terms, which may result in delays to our development timelines and increased costs. We will rely heavily on these third parties over the course of our nonclinical studies and clinical trials, and we control only certain aspects of their activities. As a result, we will have less direct control over the conduct, timing and completion of these nonclinical studies and clinical trials and the management of data developed through nonclinical studies and clinical trials than would be the case if we were relying entirely upon our own staff. Nevertheless, we are responsible for ensuring that each of our studies is conducted in accordance with applicable protocol, legal and regulatory requirements and scientific standards, and our reliance on third parties does not relieve us of our regulatory responsibilities. We and these third parties are required to comply with GCPs, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for product candidates in clinical development. Regulatory authorities enforce these GCPs through periodic inspections of clinical trial sponsors, principal investigators and clinical trial sites. If we or any of these third parties fail to comply with applicable GCP regulations, 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, such regulatory authorities will determine that any of our clinical trials comply with the GCP regulations. In addition, our clinical trials must be conducted with pharmaceutical product produced under cGMP regulations and will require a large number of test patients. Our failure or any failure by these third parties to comply with these regulations or to recruit a sufficient number of patients may require us to repeat clinical trials, which would delay the regulatory approval process. Moreover, our business may be implicated if any of these third parties violates federal or state fraud and abuse or false claims laws and regulations or healthcare privacy and security laws.

Any third parties conducting our clinical trials are not and will not be our employees and, except for remedies available to us under our agreements with such third parties, we cannot control whether or not they devote sufficient time and resources to our ongoing, clinical and non-clinical product candidates. These third parties 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, which could affect their performance on our behalf. If these third parties do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols or regulatory requirements or for other reasons, our clinical trials may be extended, delayed or terminated and we may not be able to complete development of, obtain regulatory approval of or successfully commercialize our product candidates. As a result, our financial results and the commercial prospects for our product candidates would be harmed, our costs could increase and our ability to generate revenue could be delayed.

Switching or adding third parties to conduct our nonclinical studies and clinical trials involves substantial cost and requires extensive management time and focus. In addition, there is a natural transition period when a new third party commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines.

We contract with third parties for the manufacture of our product candidates for nonclinical studies and our clinical trials, and expect to continue to do so for additional clinical trials and ultimately for commercialization. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or drugs or such quantities at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We do not currently have the infrastructure or internal capability to manufacture supplies of our product candidates for use in development and commercialization. We rely, and expect to continue to rely, on third-party manufacturers for the production of our product candidates for nonclinical studies and clinical trials under the guidance of members of our organization. We do not have long-term supply agreements. Furthermore, the raw materials for our product candidates are sourced, in some cases, from a single-source supplier. If we were to experience an unexpected loss of supply of any of our product candidates or any of our future product candidates for any reason, whether as a result of manufacturing, supply or storage issues or otherwise, we could experience delays, disruptions, suspensions or terminations of, or be required to restart or repeat, any pending or ongoing clinical trials. For example, the extent to which the COVID-19 pandemic impacts our ability to procure sufficient supplies for the development of our products and product candidates will depend on the severity and duration of the spread of the virus, and the actions undertaken to contain COVID-19 or treat its effects. 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. 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 of our 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 marketing approval 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 approve these facilities for the manufacture of our

product candidates or if it withdraws any such approval 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 current and anticipated future dependence upon others for the manufacture of our product candidates or drugs may adversely affect our future profit margins and our ability to commercialize any product candidates that receive marketing approval on a timely and competitive basis.

Our manufacturing process needs to comply with FDA regulations relating to the quality and reliability of such processes. Any failure to comply with relevant regulations could result in delays in or termination of our clinical programs and suspension or withdrawal of any regulatory approvals.

In order to commercially produce our products either at our own facility or at a third party's facility, we will need to comply with the FDA's cGMP regulations and guidelines. We may encounter difficulties in achieving quality control and quality assurance and may experience shortages in qualified personnel. We are subject to inspections by the FDA and comparable foreign regulatory authorities to confirm compliance with applicable regulatory requirements. Any failure to follow cGMP or other regulatory requirements or delay, interruption or other issues that arise in the manufacture, fill-finish, packaging, or storage of our precision medicines as a result of a failure of our facilities or the facilities or operations of third parties to comply with regulatory requirements or pass any regulatory authority inspection could significantly impair our ability to develop and commercialize our product candidates, including leading to significant delays in the availability of our precision medicines for our clinical trials or the termination of or suspension of a clinical trial, or the delay or prevention of a filing or approval of marketing applications for our product candidates. Significant non-compliance could also result in the imposition of sanctions, including warning or untitled letters, fines, injunctions, civil penalties, failure of regulatory authorities to grant marketing approvals for our product candidates, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of products, operating restrictions and criminal prosecutions, any of which could damage our reputation and our business.

If our third-party manufacturers use hazardous 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 materials, by our third-party manufacturers. Our manufacturers are subject to federal, state and local laws and regulations in the United States 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. 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.

We may use strategic collaborations, licensing arrangements or partnerships to accelerate the development and maximize the commercial potential of our programs, and we may not realize the benefits of such collaborations, arrangements or partnerships.

We own worldwide rights to fosgonimeton as well as our pipeline of small molecule candidates. Where appropriate, we may use strategic collaborations, licensing arrangements or partnerships to accelerate the development and maximize the commercial potential of our programs. Any of these relationships may require us to incur non-recurring and other charges, increase our near and long-term expenditures, issue securities that dilute our existing stockholders or disrupt our management and business.

We face significant competition in seeking appropriate strategic partners and the negotiation process is time-consuming and complex. Moreover, we may not be successful in our efforts to establish a strategic partnership or other alternative arrangements for our product candidates because they may be deemed to be at too early of a stage of development for collaborative effort and third parties may not view our product candidates as having the requisite potential to demonstrate safety and efficacy and obtain marketing approval. In addition, the effects to our business and reputation discussed in "*—An independent special committee of our board of directors engaged in a review of papers co-authored by our former chief executive officer in connection with her doctoral research at Washington State University. The special committee's findings included that (i) our former chief executive office altered images in her 2011 doctoral dissertation and at least four research papers that she co-authored while a graduate student at Washington State University, and published from 2011 to 2014, (ii) that we cited challenged research papers in certain communications and applications, and (iii) that WSU's dihexa patent, exclusively licensed to us, incorporated certain of these altered images. Washington State University has undertaken a review of claims of potential research misconduct involving our former chief executive officer's doctoral research at Washington State University. We cannot predict when WSU's investigation will be completed or what conclusions WSU will reach*," may discourage potential counterparties from entering into relationships with us.

If and when we seek to enter into collaborations, 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 a 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.

Even if we are successful in entering into collaborations involving our product candidates, these relationships are subject to numerous risks, which may include the following:

- collaborators have significant discretion in determining the efforts and resources that they will apply to a collaboration;
- collaborators may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization of our product candidates based on clinical trial results, changes in their strategic focus due to the acquisition of competitive products, availability of funding or other external factors, such as a business combination that diverts resources or creates competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial, stop a clinical trial, 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;

- a collaborator with marketing and distribution rights to one or more products may not commit sufficient resources to their marketing and distribution;
- collaborators may not properly maintain or defend our intellectual property rights or may use our intellectual property or proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential liability;
- disputes may arise between us and a collaborator that cause 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;
- 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
- collaborators may own or co-own intellectual property covering our products that results from our collaborating with them, and in such cases, we would not have the exclusive right to commercialize such intellectual property.

As a result, if we enter into additional strategic collaborations, licensing arrangements or partnerships, we may not be able to realize the benefit of such transactions if we are unable to successfully integrate them with our existing operations and company culture, which could delay our timelines or otherwise adversely affect our business. We also cannot be certain that, following a strategic collaboration, licensing arrangement or partnership, we will achieve the revenue or specific net income that justifies such transaction. Any delays in entering into new strategic collaborations, licensing arrangements or partnerships related to our product candidates could delay the development and commercialization of our product candidates in certain geographies for certain indications, which would harm our business prospects, financial condition and results of operations.

If we engage in future acquisitions or strategic partnerships, this may increase our capital requirements, dilute our stockholders, cause us to incur debt or assume contingent liabilities, and subject us to other risks.

From time to time, we evaluate various acquisition opportunities and strategic partnerships, including licensing or acquiring complementary products, intellectual property rights, technologies or businesses. Any potential acquisition or strategic partnership may entail numerous risks, including:

- increased operating expenses and cash requirements;
- the assumption of additional indebtedness or contingent liabilities;
- the issuance of our equity securities;
- assimilation of operations, intellectual property and products of an acquired company, including difficulties associated with integrating new personnel;
- the diversion of our management’s attention from our existing programs and initiatives in pursuing such a strategic merger or acquisition;
- retention of key employees, the loss of key personnel and uncertainties in our ability to maintain key business relationships;
- risks and uncertainties associated with the other party to such a transaction, including the prospects of that party and their existing products or product candidates and marketing approvals; and
- our inability to generate revenue from acquired technology and/or products sufficient to meet our objectives in undertaking the acquisition or even to offset the associated acquisition and maintenance costs.

In addition, if we undertake acquisitions or pursue partnerships in the future, we may issue dilutive securities, assume or incur debt obligations, incur large one-time expenses and acquire intangible assets that could result in significant future amortization expense.

Risks Relating to Our Ability to Commercialize our Product

Even if approved, our product candidates may not achieve adequate market acceptance among physicians, patients, healthcare payors and others in the medical community necessary for commercial success.

Even if our product candidates receive regulatory approval, they may not gain adequate market acceptance among physicians, patients, healthcare payors and others in the medical community. The degree of market acceptance or reimbursement of any of our approved product candidates will depend on a number of factors, including:

- the efficacy and safety profile as demonstrated in clinical trials compared to alternative treatments;
- the timing of market introduction of the product candidate as well as competitive products;
- the clinical indications for which the product candidate is approved;
- the extent of physician acceptance of FDA-approved Alzheimer's therapies;
- restrictions on the use of our product candidates, such as boxed warnings or contraindications in labeling, or a REMS, if any, which may not be required of alternative treatments and competitor products;
- the potential and perceived advantages of product candidates over alternative treatments;
- the cost of treatment in relation to alternative treatments;
- pricing and the availability of coverage and adequate reimbursement by third-party payors, including government authorities;
- the availability of the approved product candidate for use as a combination therapy;
- relative convenience and ease of administration;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the effectiveness of sales and marketing efforts;
- unfavorable publicity relating to our products or product candidates or similar approved products or product candidates in development by third parties; and
- the approval of other new therapies for the same indications.

If any of our product candidates are approved but do not achieve an adequate level of acceptance by physicians, hospitals, healthcare payors and patients, we may not generate or derive sufficient revenue from such product candidates and our financial results could be negatively impacted.

We have never commercialized a product candidate before and may lack the necessary expertise, personnel and resources to successfully commercialize any products on our own or together with suitable collaborators.

We have never commercialized a product candidate. We may license certain rights with respect to our product candidates to collaborators, and, if so, we will rely on the assistance and guidance of those collaborators. For product candidates for which we retain commercialization rights and marketing approval, we will have to develop our own sales, marketing and supply organization or outsource these activities to a third party.

Factors that may affect our ability to commercialize our product candidates, if approved, on our own include recruiting and retaining adequate numbers of effective sales and marketing personnel, developing adequate educational and marketing programs to increase public acceptance of our approved product candidates, ensuring regulatory compliance of our company, employees and third parties under applicable healthcare laws, and other unforeseen costs associated with creating an independent sales and marketing organization. Developing a sales and marketing organization will be expensive and time-consuming and could delay the launch of our product candidates upon approval. We may not be able to build an effective sales and marketing organization. If we are unable to build our own distribution and marketing capabilities or to find suitable partners for the commercialization of our product candidates, we may not generate revenues from them or be able to reach or sustain profitability.

If the market opportunity for any product candidate that we develop is smaller than we believe, our revenue may be adversely affected and our business may suffer.

We intend to initially focus our product candidate development on treatments for various CNS and peripheral disorder indications. The addressable patient populations that may benefit from treatment with our product candidates, if approved, are based on our estimates. These estimates, which have been derived from a variety of sources, including scientific literature, surveys of clinics, patient foundations and market research, may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of these CNS and peripheral disorders. Any regulatory approval of our product candidates would be limited to the therapeutic indications examined in our clinical trials and as determined by the FDA, which would not permit us to market our products for any other therapeutic indications not expressly approved by the FDA. Additionally, the potentially addressable patient population for our product candidates may not ultimately be amenable to treatment with our product candidates. Even if we receive regulatory approval for any of our product candidates, such approval could be conditioned upon label restrictions that materially limit the addressable patient population. Our market opportunity may also be limited by future competitor treatments that enter the market. If any of our estimates prove to be inaccurate, the market opportunity for any product candidate that we or our strategic partners develop could be significantly diminished and have an adverse material impact on our business.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our product candidates.

We face an inherent risk of product liability as a result of the planned clinical testing of our product candidates and will face an even greater risk if we commercialize any products. For example, we may be sued if our product candidates cause or are perceived to cause injury or are found to be otherwise unsuitable during clinical testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our product candidates. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our product candidates or products that we may develop;
- injury to our reputation;
- withdrawal of clinical trial participants
- initiation of investigations by regulators;
- costs to defend the related litigation;
- diversion of management’s time and our resources;
- substantial monetary awards to clinical trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;

- loss of revenue;
- exhaustion of any available insurance and our capital resources;
- the inability to commercialize any product candidate; and
- a decline in our share price.

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.

The insurance coverage and reimbursement status of newly-approved products is uncertain. Our product candidates may become subject to unfavorable pricing regulations, third-party coverage and reimbursement practices, or healthcare reform initiatives, which would harm our business. Failure to obtain or maintain adequate coverage and reimbursement for new or current products could limit our ability to market those products and decrease our ability to generate revenue.

The regulations that govern marketing approvals, pricing, coverage and reimbursement for new drugs vary widely from country to country. In the United States, recently enacted legislation may significantly change the approval requirements in ways that could involve additional costs and cause delays in obtaining approvals. Some countries require approval of the sale price of a drug before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a product in a particular country, but then be subject to price regulations that delay our commercial launch of the product, possibly for lengthy time periods, and negatively impact the revenue we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if any product candidates we may develop obtain marketing approval.

In the United States and markets in other countries, patients generally rely on third-party payors to reimburse all or part of the costs associated with their treatment. Adequate coverage and reimbursement from governmental healthcare programs, such as Medicare and Medicaid, and commercial payors is critical to new product acceptance. 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 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 such as gene therapy products. Sales of these or other future product candidates that we may identify will depend substantially, both domestically and abroad, on the extent to which the costs of our product candidates will be paid by health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, or reimbursed by government health administration authorities, private health coverage insurers and other third-party payors. If coverage and adequate reimbursement is not available, or is available only to limited levels, we may not be able to successfully commercialize our product candidates. Even if coverage is provided, the approved reimbursement amount may not be high enough to allow us to establish or maintain pricing sufficient to realize a sufficient return on our investment. Reimbursement by a third-party payor may depend upon a

number of factors, including, but not limited to, the third-party payor's determination that use of a product is:

- a covered benefit under its health plan;
- safe, effective and medically necessary;
- appropriate for the specific patient;
- cost-effective; and
- neither experimental nor investigational.

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. In general, the prices of medicines under such systems are substantially lower than in the United States. Other countries allow companies to fix their own prices for medicines, 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 products may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenue and profits.

There is also significant uncertainty related to the insurance coverage and reimbursement of newly approved products and coverage may be more limited than the purposes for which the medicine is approved by the FDA or comparable foreign regulatory authorities. In the United States, the principal decisions about reimbursement for new medicines are typically made by the Centers for Medicare & Medicaid Services, or CMS, an agency within the U.S. Department of Health and Human Services, or HHS. CMS decides whether and to what extent a new medicine will be covered and reimbursed under Medicare and private payors tend to follow CMS to a substantial degree. No uniform policy of coverage and reimbursement for products exists among third-party payors and coverage and reimbursement levels 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 may require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. It is difficult to predict what CMS will decide with respect to reimbursement for fundamentally novel products such as ours. Reimbursement agencies in Europe may be more conservative than CMS. Moreover, eligibility for reimbursement does not imply that any drug will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale, and distribution. Interim reimbursement levels for new drugs, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement rates may vary according to the use of the drug and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost drugs and may be incorporated into existing payments for other services. Our inability to promptly obtain coverage and profitable payment rates from both government-funded and private payors for any approved products we may develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize product candidates, and our overall financial condition.

Net prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. Our inability to promptly obtain coverage and profitable reimbursement rates third-party payors for any approved products that we develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. We cannot be sure that reimbursement will be available for any product candidate that we commercialize and, if reimbursement

is available, the level of reimbursement. Reimbursement may impact the demand for, or the price of, any product candidate for which we obtain marketing approval. In order to obtain reimbursement, physicians may need to show that patients have superior treatment outcomes with our products compared to standard of care drugs, including lower-priced generic versions of standard of care drugs. We expect to experience pricing pressures in connection with the sale of any 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 surgical procedures and other treatments, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products.

A variety of risks associated with marketing our product candidates internationally may materially adversely affect our business.

We plan to eventually seek regulatory approval of our product candidates outside of the United States and, accordingly, we expect that we will be subject to additional risks related to operating in foreign countries if we obtain the necessary approvals, including:

- differing regulatory requirements in foreign countries, such as the lack of pathways for accelerated drug approval, may result in foreign regulatory approvals taking longer and being more costly than obtaining approval in the United States;
- foreign regulatory authorities may disagree with the design, implementation or results of our clinical trials or our interpretation of data from nonclinical studies or clinical trials;
- approval policies or regulations of foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval;
- impact of the COVID-19 pandemic on our ability to produce our product candidates and conduct clinical trials in foreign countries;
- unexpected changes in tariffs, trade barriers, price and exchange controls and other regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with legal requirements applicable to privacy, data protection, information security and other matters;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign taxes, including withholding of payroll taxes;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenue, and other obligations incident to doing business in another country;
- difficulties staffing and managing foreign operations;
- complexities associated with managing multiple payor reimbursement regimes and government payors in foreign countries;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- potential liability under the Foreign Corrupt Practices Act of 1977 or comparable foreign regulations;
- challenges enforcing our contractual and intellectual property rights, especially in those foreign countries that do not respect and protect intellectual property rights to the same extent as the United States;

- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geo-political actions, including war and terrorism.

These and other risks associated with international operations may materially adversely affect our ability to attain or maintain profitable operations.

Risks Relating to Our Intellectual Property

Our success depends on our ability to protect our intellectual property and our proprietary technologies.

Our commercial success depends in part on our ability to obtain and maintain patent protection and trade secret protection for our product candidates, proprietary technologies and their uses as well as our ability to operate without infringing upon the proprietary rights of others. We generally seek to protect our proprietary position by filing patent applications in the United States and abroad related to our product candidates, proprietary technologies and their uses that are important to our business. We may also seek to protect our proprietary position by acquiring or in-licensing relevant issued patents or pending applications from third parties.

Pending patent applications cannot be enforced against third parties practicing the technology claimed in such applications unless, and until, patents issue from such applications, and then only to the extent the issued claims cover the technology. There can be no assurance that our patent applications or the patent applications of any current or future licensors will result in additional patents being issued or that issued patents will afford sufficient protection against competitors with similar technology, nor can there be any assurance that the patents issued will not be infringed, designed around, found unenforceable or invalidated by third parties.

Even issued patents may later be found invalid or unenforceable or may be modified or revoked in proceedings instituted by third parties or the patent owner before various patent offices or in courts. Thus, the degree of future protection for our and any current or future licensors' proprietary rights is uncertain. Only limited protection may be available and may not adequately protect our rights or permit us to gain or keep any competitive advantage. These uncertainties and/or limitations in our ability to properly protect the intellectual property rights relating to our product candidates could have a material adverse effect on our financial condition and results of operations.

As of December 31, 2021, our patent portfolio includes one issued U.S. patent, two pending U.S. patent applications, one issued patent in a jurisdiction outside of the U.S., nine pending patent applications in jurisdictions outside of the U.S., and three pending international patent applications filed under the Patent Cooperation Treaty. Our owned patent and patent applications have claims directed to our product candidate fosgonimeton as composition of matter and methods of treatment with fosgonimeton, as well as other small molecule therapeutics. The U.S. patent will expire in June 2037, absent any patent term extensions for regulatory delay. Dr. Kawas is an inventor on these company-owned patents. Our patent portfolio also includes eight issued U.S. patents and approximately 13 patents issued and one patent application pending in jurisdictions outside of the U.S. that are exclusively licensed to us by WSU. The in-licensed patent portfolio includes issued U.S. patents that do not directly cover fosgonimeton as a composition of matter or pharmaceutical formulation, but instead cover the active metabolite of fosgonimeton, which is hexanoic-tyrosine-isoleucine-(6)-amino-hexanoic amide (dihexa), and uses of dihexa. Dr. Kawas is an inventor on five of the in-licensed issued U.S. patents.

We cannot be certain that the claims in our pending patent applications or those of any current or future licensors, will be considered patentable by the United States Patent and Trademark Office, or USPTO, courts in the United States or by the patent offices and courts in foreign countries, nor can we be certain that the claims in our owned or in-licensed patents will not be found invalid or unenforceable if challenged.

The patent application process is subject to numerous risks and uncertainties, and there can be no assurance that we or any of our potential future collaborators will be successful in protecting our product candidates by obtaining and defending patents. These risks and uncertainties include the following:

- the USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process, the noncompliance with which can result in abandonment or lapse of a patent or patent application, and partial or complete loss of patent rights in the relevant jurisdiction;
- patent applications may not result in any patents being issued;
- patents and patent applications may be challenged, invalidated, modified, revoked, circumvented, found to be unenforceable or otherwise may not provide any competitive advantage;
- changes to patent laws in the United States or in other countries may limit the ability to obtain, defend or enforce patents, or may apply retroactively to affect the terms and/or scope of patents;
- our competitors, many of whom have substantially greater resources than we do and many of whom have made significant investments in competing technologies, may seek or may have already obtained patents that will limit, interfere with or eliminate our ability to make, use and sell our potential product candidates;
- there may be significant pressure on the U.S. government and international governmental bodies to limit the scope of patent protection both inside and outside the United States for disease treatments that prove successful, as a matter of public policy regarding worldwide health concerns; and
- countries other than the United States may have patent laws less favorable to patentees than those upheld by U.S. courts, allowing foreign competitors a better opportunity to create, develop and market competing product candidates.

The patent prosecution process is also expensive and time-consuming, and we and any current or future licensors may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner or in all jurisdictions where protection may be commercially advantageous. It is also possible that we or any current or future licensors will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection.

In addition, although we enter into non-disclosure and confidentiality agreements with parties who have access to patentable aspects of our research and development output, such as our employees, outside scientific collaborators, CROs, third-party manufacturers, consultants, advisors and other third parties, any of these parties may breach such agreements and disclose such output before a patent application is filed, thereby jeopardizing our ability to seek patent protection.

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. As a result, our intellectual property may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

If the scope of any patent protection we obtain is not sufficiently broad, or if we lose any of our patent protection, our ability to prevent our competitors from commercializing similar or identical product candidates would be adversely affected.

The patent position of biopharmaceutical companies generally is highly uncertain, involves complex legal and factual questions, and has been the subject of much litigation in recent years. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our pending and future patent applications and those of any current or future licensors may not result in patents being issued which protect our product candidates or which effectively prevent others from commercializing competitive product candidates.

Moreover, the coverage claimed in a patent application can be significantly reduced before the patent is issued, and its scope can be reinterpreted after issuance. Even if patent applications we own or in-license currently or in the future issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors or other third parties from competing with us, or otherwise provide us with any competitive advantage. Any patents that we own or in-license may be challenged or circumvented by third parties or may be narrowed, invalidated or rendered unenforceable as a result of challenges by third parties. Consequently, we do not know whether our product candidates will be protectable or remain protected by valid and enforceable patents. Our competitors or other third parties may be able to circumvent our patents or the patents of any current or future licensors by developing similar or alternative technologies or products in a non-infringing manner which could materially adversely affect our business, financial condition, results of operations and prospects.

The issuance of a patent is not conclusive as to its inventorship, scope, validity, or enforceability, and our patents or the patents of any current or future licensors may be challenged in the courts or patent offices in the United States and abroad. We may be subject to a third-party pre-issuance submission of prior art to the USPTO, or become involved in opposition, derivation, revocation, reexamination, post-grant review, or PGR, and *inter partes* review, or IPR, or other similar proceedings challenging our patent rights. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate or render unenforceable, our patent rights, allow third parties to commercialize our product candidates and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights.

Moreover, our patents or the patents of any current or future licensors may become subject to post-grant challenge proceedings, such as oppositions in a foreign patent office, that challenge our claim of priority of invention or other features of patentability with respect to our patents and patent applications and those of any current or future licensors.

For example, in view of the lawsuits disclosed elsewhere in this report including in this “Risk Factors” section under the heading “*—We and certain of our directors and executive officers have been named as defendants in lawsuits that could result in substantial costs and divert management’s attention*,” and in “Part I, Item 3—Legal Proceedings,” third parties may challenge the validity or enforceability of our in-licensed patents and patent applications. The outcome following legal assertions of invalidity and unenforceability is unpredictable. Such challenges may result in loss of patent rights, 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 technology and products such as other modifications to dihexa not covered by our issued patents. 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. In addition, if the breadth or strength of protection provided by our in-licensed patents and patent applications is threatened, regardless of the outcome, it could dissuade companies from collaborating with us to license, develop, or commercialize current or future product candidates. Further, these proceedings could have a material adverse effect on our business, results of operations and financial condition.

Even though we own patents and patent applications covering fosgonimeton, our patents and any future patents we obtain may not effectively prevent others from developing or commercializing products similar to our product candidates. While the fosgonimeton patent family is distinct from, and not part of the same patent family as, the dihexa patent licensed from WSU, and therefore is not implicated in the allegations that Dr. Kawas altered images in connection with her doctoral studies, third parties may use these allegations to cast doubt on the validity and enforceability of our owned patents or patent applications. Such events may result in substantial cost and require significant time from our scientists and management, and could dissuade companies from collaborating with us to license, develop, or commercialize current or future product candidates, even if the eventual outcome is favorable to us.

We and/or WSU may in the future file one or more requests for supplemental examination of certain patents for the USPTO to reconsider the enforceability and validity of the patents (including any patents relating to dihexa) in view of the allegations that Dr. Kawas altered images in connection with her doctoral

studies. The outcome of any supplemental examination procedure is unpredictable. If a substantial new question of patentability is found, the USPTO Director will order ex parte reexamination of the patent. An adverse determination in such a proceeding could reduce the scope of, or invalidate or render unenforceable, the affected patent rights. While supplemental examination proceedings that result in our favor would bolster the presumption of validity and enforceability of the examined patents, third parties may still challenge the patents and patent applications in litigation or other legal proceedings.

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. For example:

- others may be able to develop products that are similar to our product candidates but that are not covered by the claims of the patents that we own or license;
- we or any current or future licensors or collaborators might not have been the first to make the inventions covered by the issued patents or patent application that we own or license;
- we or any current or future licensors or collaborators might not have been the first to file patent applications covering certain of our inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- it is possible that the pending patent applications we own or license will not lead to issued patents;
- issued patents that we own or license may be held invalid or unenforceable, as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- the patents of others may have an adverse effect on our business; and
- 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.

Should any of these events occur, it could significantly harm our business, results of operations and prospects.

Our commercial success depends significantly on our ability to operate without infringing the patents and other proprietary rights of third parties. Claims by third parties that we infringe their proprietary rights may result in liability for damages or prevent or delay our developmental and commercialization efforts.

Our commercial success depends in part on avoiding infringement of the patents and proprietary rights of third parties. However, our research, development and commercialization activities may be subject to claims that we infringe or otherwise violate patents or other intellectual property rights owned or controlled by third parties. Other entities may have or obtain patents or proprietary rights that could limit our ability to make, use, sell, offer for sale or import our product candidates and products that may be approved in the future, or impair our competitive position. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biopharmaceutical industry, including patent infringement lawsuits, oppositions, reexaminations, IPR proceedings and PGR

proceedings before the USPTO and/or corresponding foreign patent offices. Numerous third-party U.S. and foreign issued patents and pending patent applications exist in the fields in which we are developing product candidates. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates.

As the biopharmaceutical industry expands and more patents are issued, the risk increases that our product candidates may be subject to claims of infringement of the patent rights of third parties. Because patent applications are maintained as confidential for a certain period of time, until the relevant application is published, we may be unaware of third-party patents that may be infringed by commercialization of any of our product candidates, and we cannot be certain that we were the first to file a patent application related to a product candidate or technology. Moreover, because patent applications can take many years to issue, there may be currently-pending patent applications that may later result in issued patents that our product candidates may infringe. In addition, identification of third-party patent rights that may be relevant to our technology is difficult because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning of patent claims. There is also no assurance that there is not prior art of which we are aware, but which we do not believe is relevant to our business, which may, nonetheless, ultimately be found to limit our ability to make, use, sell, offer for sale or import our product candidates that may be approved in the future, or impair our competitive position. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. Any claims of patent infringement asserted by third parties would be time consuming and could:

- result in costly litigation that may cause negative publicity;
- divert the time and attention of our technical personnel and management;
- cause development delays;
- prevent us from commercializing any of our product candidates until the asserted patent expires or is held finally invalid or not infringed in a court of law;
- require us to develop non-infringing technology, which may not be possible on a cost-effective basis;
- subject us to significant liability to third parties; or
- require us to enter into royalty or licensing agreements, which may not be available on commercially reasonable terms, or at all, or which might be non-exclusive, which could result in our competitors gaining access to the same technology.

Although no third party has asserted a claim of patent infringement against us as of the date of this report, others may hold proprietary rights that could prevent our product candidates from being marketed. Any patent-related legal action against us claiming damages and seeking to enjoin commercial activities relating to our product candidates, treatment indications, or processes could subject us to significant liability for damages, including treble damages if we were determined to willfully infringe, and require us to obtain a license to manufacture or market our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. We cannot predict whether we would prevail in any such actions or that any license required under any of these patents would be made available on commercially acceptable terms, if at all. Moreover, even if we or a future strategic partner were able to obtain a license, the rights may be nonexclusive, which could result in our competitors gaining access to the same intellectual property. In addition, we cannot be certain that we could redesign our product candidates, our treatment indications, or processes to avoid infringement, if necessary. Accordingly, an adverse determination in a judicial or administrative proceeding, or the failure to obtain necessary licenses, could prevent us from developing and commercializing our product candidates, which could harm our business, financial condition and operating results. In addition, intellectual property litigation, regardless of its outcome, may cause negative

publicity and could prohibit us from marketing or otherwise commercializing our product candidates and technology.

Parties making claims against us may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation or administrative proceedings, there is a risk that some of our confidential information could be compromised by disclosure. In addition, any uncertainties resulting from the initiation and continuation of any litigation could have material adverse effect on our ability to raise additional funds or otherwise have a material adverse effect on our business, results of operations, financial condition and prospects.

We may not be successful in obtaining or maintaining necessary rights to our product candidates through acquisitions and in-licenses.

Because our development programs may in the future require the use of proprietary rights held by third parties, the growth of our business may depend in part on our ability to acquire, in-license, or use these third-party proprietary rights. We may be unable to acquire or in-license any compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify as necessary for our product candidates. The licensing and acquisition of third-party intellectual property rights is a competitive area, and a number of 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. We also may be unable to license or acquire third-party intellectual property rights on terms that would allow us to make an appropriate return on our investment or at all. If we are unable to successfully obtain rights to required third-party intellectual property, or if we are unable to maintain the existing intellectual property rights we have, we may have to abandon development of the relevant program or product candidate, which could have a material adverse effect on our business, financial condition, results of operations, and prospects.

We may be involved in lawsuits to protect or enforce our patents or any current or future licensors' patents, which could be expensive, time consuming and unsuccessful. Further, our issued patents or any current or future licensors' patents could be found invalid or unenforceable if challenged in court.

Competitors may infringe our intellectual property rights. To prevent infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. In addition, in a patent infringement proceeding, a court may decide that a patent we own or in-license is not valid, is unenforceable, and/or is not infringed. If we or any of our potential future collaborators were to initiate legal proceedings against a third party to enforce a patent directed at one of our product candidates, the defendant could counterclaim that our patent or the patent of any current or future licensors is invalid and/or unenforceable in whole or in part. In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace. Grounds for a validity challenge include an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, lack of sufficient written description, non-enablement, or obviousness-type double patenting. Grounds for an unenforceability assertion could include an allegation that someone connected with prosecution of the patent misrepresented or fraudulently withheld relevant information from the USPTO or made a misleading statement during prosecution.

Third parties may also raise similar invalidity claims before the USPTO or patent offices abroad, even outside the context of litigation. Such mechanisms include re-examination, PGR, IPR, derivation proceedings, and equivalent proceedings in foreign jurisdictions (e.g., opposition proceedings). Such proceedings could result in the revocation of, cancellation of, or amendment to our patents or any current or future licensors' patents in such a way that they no longer cover our technology or platform, or any product candidates that we may develop. The outcome following legal assertions of invalidity and

unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. If a third party were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our technology or platform, or any product candidates that we may develop. Such a loss of patent protection would have a material adverse impact on our business, financial condition, results of operations and prospects.

The outcome following legal assertions of invalidity and/or unenforceability is unpredictable, and prior art could render our patents or any current or future licensors' patents invalid. There is no assurance that all potentially relevant prior art relating to our patents and patents applications or the patents and patent applications of any current or future licensors has been found. There is also no assurance that there is not prior art of which we are aware, but which we do not believe affects the validity or enforceability of a claim in our patents and patent applications or the patents and patent applications of any current or future licensors, which may, nonetheless, ultimately be found to affect the validity or enforceability of a claim. Additionally, a finding that issued claims lack sufficient written description or are not enabled could render our patent or any current or future licensors' patent invalid.

If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we may lose at least part, and perhaps all, of the patent protection on such product candidate. In addition, if the breadth or strength of protection provided by our patents and patent applications or the patents and patent applications of any current or future licensors is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates. Such a loss of patent protection would have a material adverse impact on our business.

Even if resolved in our favor, litigation or other legal proceedings relating to our intellectual property rights may cause us to incur significant expenses, and could distract our technical and management personnel from their normal responsibilities. 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. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise our ability to compete in the marketplace.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation or other legal proceedings relating to our intellectual property rights, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation or other proceedings. 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.

In addition, the issuance of a patent does not give us the right to practice the patented invention. Third parties may have blocking patents that could prevent us from marketing our own patented product and practicing our own patented technology.

Intellectual property litigation or legal proceedings may lead to unfavorable publicity that harms our reputation and causes the market price of our common shares to decline.

During the course of any intellectual property litigation or legal proceeding, there could be public announcements of the initiation of the litigation or legal proceeding as well as results of hearings, rulings on motions, and other interim proceedings. If securities analysts or investors regard these announcements

as negative, the perceived value of our existing product candidates, programs or intellectual property could be diminished. Accordingly, the market price of shares of our common stock may decline. Such announcements could also harm our reputation or the market for our future products, which could have a material adverse effect on our business.

Derivation proceedings may be necessary to determine priority of inventions, and an unfavorable outcome may require us to cease using the related technology or to attempt to license rights from the prevailing party.

Derivation proceedings provoked by third parties or brought by us or declared by the USPTO may be necessary to determine the priority of inventions with respect to our patents or patent applications or those of any current or future licensors. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms. Our defense of derivation proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. In addition, the uncertainties associated with such proceedings could have a material adverse effect on our ability to raise the funds necessary to continue our clinical trials, continue our research programs, license necessary technology from third parties or enter into development or manufacturing partnerships that would help us bring our product candidates to market.

Patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications or those of any current or future licensors and the enforcement or defense of our issued patents or those of any current or future licensors.

On September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law. These include provisions that affect the way patent applications will be prosecuted and may also affect patent litigation. In particular, under the Leahy-Smith Act, the United States transitioned in March 2013 to a “first inventor to file” system in which, assuming that other requirements of patentability are met, the first inventor to file a patent application will be entitled to the patent regardless of whether a third party was first to invent the claimed invention. A third party that files a patent application in the USPTO after March 2013 but before us could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by such third party. This will require us to be cognizant going forward of the time from invention to filing of a patent application. Furthermore, our ability to obtain and maintain valid and enforceable patents depends on whether the differences between our technology and the prior art allow our technology to be patentable over the prior art. Since patent applications in the United States and most other countries are confidential for a period of time after filing or until issuance, we may not be certain that we or any current or future licensors are the first to either (1) file any patent application related to our product candidates or (2) invent any of the inventions claimed in the patents or patent applications.

The Leahy-Smith Act also includes a number of significant changes that affect the way patent applications are prosecuted and also may affect patent litigation. These include allowing third-party submission of printed publications to the USPTO during patent prosecution and additional procedures to attack the validity or enforceability of a patent by USPTO-administered post-grant proceedings, including PGR, IPR, and derivation proceedings. An adverse determination in any such submission or proceeding could reduce the scope or enforceability of, or invalidate, our patent rights, which could adversely affect our competitive position.

Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in United States federal courts necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action. Thus, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications or those of any current or future licensors and the enforcement or

defense of our issued patents or those of any current or future licensors, all of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

Changes in U.S. patent law, or laws in other countries, could diminish the value of patents in general, thereby impairing our ability to protect our product candidates.

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve a high degree of technological and legal complexity. Therefore, obtaining and enforcing biopharmaceutical patents is costly, time consuming and inherently uncertain. Changes in either the patent laws or in the interpretations of patent laws in the United States and other countries may diminish the value of our intellectual property and may increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of issued patents. We cannot predict the breadth of claims that may be allowed or enforced in our patents or in third-party patents. In addition, Congress or other foreign legislative bodies may pass patent reform legislation that is unfavorable to us.

For example, the U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the U.S. federal courts, the USPTO, or similar authorities in foreign jurisdictions, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patent and the patents we might obtain or license in the future. As an example, no earlier that October 1, 2022, European patent applications will soon have the option, upon grant of a patent, of becoming a Unitary Patent, which will be subject to the jurisdiction of the Unitary Patent Court (“UPC”). The option of a Unitary Patent will be a significant change in European patent practice. As the UPC is a new court system, there is no precedent for the court, increasing the uncertainty of any litigation in the UPC.

We may be subject to claims challenging the inventorship or ownership of our patents and other intellectual property.

We may also be subject to claims that former employees or other third parties have an ownership interest in our patents or other intellectual property. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and distraction to management and other employees.

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

Patents have a limited lifespan. In the United States, if all maintenance fees are timely paid, the natural expiration of a patent is generally 20 years from its earliest U.S. non-provisional filing date. Various extensions may be available, but the life of a patent, and the protection it affords, is limited. Even if patents covering our product candidates are obtained, once the patent life has expired, we may be open to competition from competitive products. 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. As a result, our patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

If we do not obtain patent term extension for our product candidates, our business may be materially harmed.

Depending upon the timing, duration and specifics of FDA marketing approval of our product candidates, one or more of our U.S. patents or those of any current or future licensors may be eligible for limited patent term restoration under the Drug Price Competition and Patent Term Restoration Act of 1984, or Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit a patent restoration term of up to five years as compensation for patent term lost during product development and the FDA regulatory review process. A maximum of one patent may be extended per FDA approved product as compensation for the patent term lost during the FDA regulatory review process. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval and only those claims covering such approved drug product, a method for using it or a method for manufacturing it may be extended. Patent term extension may also be available in certain foreign countries upon regulatory approval of our product candidates. However, we may not be granted an extension because of, for example, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term extension or restoration or the term of any such extension is less than we request, our competitors may obtain approval of competing products following our patent expiration, and our revenue could be reduced, possibly materially. Further, if this occurs, our competitors may take advantage of our investment in development and clinical trials by referencing our clinical and nonclinical data and launch their product earlier than might otherwise be the case.

We will not be able to protect our intellectual property rights throughout the world.

We own and in-license patents issued and patent applications pending in the United States and in jurisdictions outside of the United States. However, filing, prosecuting and defending patents in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States may be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we will not be able to prevent third parties from practicing our inventions in all countries outside the United States or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our inventions 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, but enforcement is not as strong as that in the United States. These products may compete with our product candidates, and our patents, the patents of any current or future licensors, or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of many foreign countries do not favor the enforcement of patents and other intellectual property protection, which could make it difficult for us to stop the infringement of our patents or any current or future licensors' patents or marketing of competing products in violation of our proprietary rights. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents or the patents of any current or future licensors at risk of being invalidated or interpreted narrowly and our patent applications or the patent applications of any current or future licensors at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, many countries limit the enforceability of patents against

government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of such patent. If we are forced to grant a license to third parties with respect to any patents relevant to our business, our competitive position may be impaired, and our business, financial condition, results of operations and prospects may be adversely affected.

Geopolitical actions could increase the uncertainties and costs surrounding the prosecution or maintenance of our patent applications or those of any current or future licensors and the maintenance, enforcement or defense of our issued patents or those of any current or future licensors. For example, the United States and foreign government actions related to Russia's invasion of Ukraine may limit or prevent filing, prosecution and maintenance of patent applications in Russia. Government actions may also prevent maintenance of issued patents in Russia. These actions could result in abandonment or lapse of our patents or patent applications, resulting in partial or complete loss of patent rights in Russia. If such an event were to occur, it could have a material adverse effect on our business. In addition, a decree was adopted by the Russian government in March 2022, allowing Russian companies and individuals to exploit inventions owned by patentees that have citizenship or nationality in, are registered in, or have a predominately primary place of business or profit-making activities in the United States and other countries that Russia has deemed unfriendly without consent or compensation. Consequently, we would not be able to prevent third parties from practicing our inventions in Russia or from selling or importing products made using our inventions in and into Russia. Accordingly, our competitive position may be impaired, and our business, financial condition, results of operations and prospects may be adversely affected.

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

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to the USPTO and various foreign patent offices at various points over the lifetime of our patents and/or applications and those of any current or future licensors. We have systems in place to remind us to pay these fees, and we rely on our outside patent annuity service to pay these fees when due. Additionally, the USPTO and various foreign patent offices require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. We employ reputable law firms and other professionals to help us comply, and in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with rules applicable to the particular jurisdiction. However, there are situations in which noncompliance 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. If such an event were to occur, it could have a material adverse effect on our business.

If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.

We intend to use registered or unregistered trademarks or trade names to brand and market ourselves and our products. Our trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition among potential partners or customers in our markets of interest, and it may be difficult and costly to register, maintain and/or protect our rights to these trademarks and trade names in jurisdictions in and outside of the United States. At times, competitors may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other registered trademarks or trademarks that incorporate variations of our registered or unregistered trademarks or trade names. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively, and our business may be adversely affected. Our efforts to enforce or protect our proprietary rights related to trademarks, trade secrets, domain names, copyrights or other intellectual

property may be ineffective and could result in substantial costs and diversion of resources and could adversely affect our financial condition or results of operations.

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

In addition, we rely on the protection of our trade secrets, including unpatented know-how, technology and other proprietary information to maintain our competitive position. Although we have taken steps to protect our trade secrets and unpatented know-how, including entering into confidentiality agreements with third parties, and confidential information and inventions agreements with employees, consultants and advisors, we cannot provide any assurances that all such agreements have been duly executed, and any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. 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.

Moreover, third parties may still obtain this information or may come upon this or similar information independently, and we would have no right to prevent them from using that technology or information to compete with us. If any of these events occurs or if we otherwise lose protection for our trade secrets, the value of this information may be greatly reduced, and our competitive position would be harmed. If we do not apply for patent protection prior to such publication or if we cannot otherwise maintain the confidentiality of our proprietary technology and other confidential information, then our ability to obtain patent protection or to protect our trade secret information may be jeopardized.

We may be subject to claims that we or our employees have wrongfully used or disclosed alleged confidential information or trade secrets.

We have entered into and may enter in the future into non-disclosure and confidentiality agreements to protect the proprietary positions of third parties, such as outside scientific collaborators, CROs, third-party manufacturers, consultants, advisors, potential partners, lessees of shared multi-company property and other third parties. We may become subject to litigation where a third party asserts that we or our employees inadvertently or otherwise breached the agreements and used or disclosed trade secrets or other information proprietary to the third parties. Defense of such matters, regardless of their merit, could involve substantial litigation expense and be a substantial diversion of employee resources from our business. We cannot predict whether we would prevail in any such actions. Moreover, intellectual property litigation, regardless of its outcome, may cause negative publicity and could prohibit us from marketing or otherwise commercializing our product candidates. Failure to defend against any such claim could subject us to significant liability for monetary damages or prevent or delay our developmental and commercialization efforts, which could adversely affect our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to our management team and other employees.

Parties making claims against us may be able to sustain the costs of complex intellectual property litigation more effectively than we can because they have substantially greater resources. 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. In addition, any uncertainties resulting from the initiation and continuation of any litigation could have material adverse effect on our ability to raise additional funds or otherwise have a material adverse effect on our business, operating results, financial condition and prospects.

We may be subject to claims that we have wrongfully hired an employee from a competitor or that we or our employees have wrongfully used or disclosed alleged confidential information or trade secrets of their former employers.

As is common in the biopharmaceutical industry, in addition to our employees, we engage the services of consultants to assist us in the development of our product candidates. Many of these consultants, and many of our employees, were previously employed at, or may have previously provided or may be currently providing consulting services to, other biopharmaceutical companies including our competitors or potential competitors. We may become subject to claims that we, our employees or a consultant inadvertently or otherwise used or disclosed trade secrets or other information proprietary to their former employers or their former or current clients. 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, which could adversely affect our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to our management team and other employees.

Our rights to develop and commercialize our product candidates may be subject, in part, to the terms and conditions of licenses granted to us by others.

We have entered into license agreements with third parties and we may enter into additional license agreements in the future with others to advance our research and development or allow commercialization of product candidates. These and other licenses may not provide exclusive rights to use such intellectual property and other rights in all relevant fields of use and in all territories in which we may wish to develop or commercialize our product candidates in the future.

In addition, subject to the terms of any such license agreements, we may not have the right to control the preparation, filing, prosecution, maintenance, enforcement, and defense of patents and patent applications covering our product candidates that we license from third parties. In such an event, we cannot be certain that these patents and patent applications will be prepared, filed, prosecuted, maintained, enforced, and defended in a manner consistent with the best interests of our business. If any of our current or future licensors fail to prosecute, maintain, enforce, and defend such patents, or lose rights to those patents or patent applications, the rights we have licensed may be reduced or eliminated, and our right to develop and commercialize any of our product candidates that are subject of such licensed rights could be adversely affected.

Our licensors and any future licensors may have relied on third party consultants or collaborators or on funds from third parties such that our licensors are not the sole and exclusive owners of the patents we in-license. If other third parties have ownership rights to our in-licensed patents, they may be able to license such patents to our competitors, and our competitors could market products similar or identical to our product candidates. This could have a material adverse effect on our competitive position, business, financial conditions, results of operations, and prospects.

It is possible that we may be unable to obtain additional licenses at a reasonable cost or on reasonable terms, if at all. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same rights licensed to us. In that event, we may be required to expend significant time and resources to redesign our 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 product candidates, which could harm our business, financial condition, results of operations, and prospects significantly. We cannot provide any assurances that third party patents do not exist which might be enforced against our current manufacturing methods, product candidates, or future methods or product candidates resulting in either an injunction prohibiting our manufacture or future sales, or, with respect to our future sales, an obligation on our part to pay royalties and/or other forms of compensation to third parties, which could be significant.

If we fail to comply with our obligations in the agreements under which we license intellectual property rights or other rights from third parties or otherwise experience disruptions to our business relationships with our licensors, we could lose license rights that are important to our business.

Disputes may arise between us and our current or future licensors regarding intellectual property and other rights subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our product candidates infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- our right to sublicense to third parties;
- our diligence obligations under the license agreement and what activities satisfy those diligence obligations;
- our right to transfer or assign the license;
- the inventorship and ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners; and
- the priority of invention of patented technology.

In addition, the agreements under which we license intellectual property or other rights from third parties are complex, and certain provisions in such agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or other rights, or increase what we believe to be our financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations, and prospects. Moreover, if disputes over intellectual property or other rights that we have licensed prevent or impair our ability to maintain our current licensing arrangements on commercially acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates, which could have a material adverse effect on our business, financial conditions, results of operations, and prospects.

In spite of our best efforts, our licensors might conclude that we have materially breached our license agreements and might therefore terminate the license agreements, thereby removing our ability to develop and commercialize product candidates covered by these license agreements. If these in-licenses are terminated, or if the underlying patents fail to provide the intended exclusivity, competitors would have the freedom to seek regulatory approval of, and to market, products identical to ours. This could have a material adverse effect on our competitive position, business, financial conditions, results of operations, and prospects.

The patent protection and patent prosecution for some of our product candidates may be dependent on third parties.

While we normally seek to obtain the right to control prosecution, maintenance and enforcement of the patent applications and patents relating to our product candidates, there may be times when the filing and prosecution activities for patent applications and patents relating to our product candidates are controlled by licensors or collaboration partners. If a licensor or collaboration partner fails to prosecute, maintain and enforce such patents and patent applications in a manner consistent with the best interests of our business, including by payment of all applicable fees for patent applications and patents covering our product candidates, we could lose our rights to the intellectual property or our exclusivity with respect to those rights, our ability to develop and commercialize those product candidates may be adversely affected and we may not be able to prevent competitors from making, using and selling products similar or identical to our product candidates. In addition, even where we have the right to control patent prosecution of patents and patent applications we have licensed to and from third parties, we may still be adversely

affected or prejudiced by actions or inactions of our licensees, our licensors and their counsel that took place prior to the date upon which we assumed control over patent prosecution.

Intellectual property discovered through government funded programs may be subject to federal regulations such as "march-in" rights, certain reporting requirements and a preference for U.S.-based companies. Compliance with such regulations may limit our exclusive rights and limit our ability to contract with non-U.S. manufacturers.

We may develop, acquire, or license intellectual property rights that have been generated through the use of U.S. government funding or grants. Pursuant to the Bayh-Dole Act of 1980, the U.S. government has certain rights in inventions developed with government funding. These U.S. government rights include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right, under certain limited circumstances, to require us to grant exclusive, partially exclusive, or non-exclusive licenses to any of these inventions to a third party if it determines that: (1) adequate steps have not been taken to commercialize the invention; (2) government action is necessary to meet public health or safety needs; or (3) government action is necessary to meet requirements for public use under federal regulations (also referred to as "march-in rights"). Such "march-in" rights would apply to new subject matter arising from the use of such government funding or grants and would not extend to pre-existing subject matter or subject matter arising from funds unrelated to the government funding or grants. If the U.S. government exercised its march-in rights in our future intellectual property rights that are generated through the use of U.S. government funding or grants, we could be forced to license or sublicense intellectual property developed by us or that we license on terms unfavorable to us, and there can be no assurance that we would receive compensation from the U.S. government for the exercise of such rights. The U.S. government also has the right to take title to these inventions if the grant recipient fails to disclose the invention to the government or fails to file an application to register the intellectual property within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us to expend substantial resources. In addition, the U.S. government requires that any products embodying any of these inventions or produced through the use of any of these inventions be manufactured substantially in the United States. This preference for U.S. industry may be waived by the federal agency that provided the funding if the owner or assignee of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. This preference for U.S. industry may limit our ability to contract with non-U.S. product manufacturers for products covered by such intellectual property.

Risks Relating to Cybersecurity

We are dependent on networks, infrastructure and data, which exposes us to data security risks, including security failures or breaches of our systems or those used by our CROs or other contractors or consultants. We are dependent upon our own or third-party information technology systems, infrastructure and data, including mobile technologies, to operate our business. The multitude and complexity of our computer systems may fail or suffer security breaches.

Despite the implementation of security measures, our internal computer systems and those of our CROs and other contractors and consultants may be vulnerable to damage from computer viruses and unauthorized access. Likewise, data privacy or security incidents or breaches by employees or others may pose a risk that sensitive data, including our intellectual property, trade secrets or personal information of our employees, patients, customers or other business partners may be exposed to unauthorized persons or to the public or may otherwise be misused. Cyberattacks are increasing in their frequency, sophistication and intensity. Cyberattacks could include the deployment of harmful malware, denial-of-service, social engineering and other means to affect service reliability and threaten data confidentiality, integrity and availability. Changes in how our employees work and access our systems during the current COVID-19 pandemic could lead to additional opportunities for bad actors to launch cyberattacks or for employees to cause inadvertent security risks or incidents. Our business partners face similar risks, and any security

breach of their systems or that they otherwise suffer could adversely affect our security posture. A security breach or privacy violation that leads to loss of or unauthorized use, disclosure or modification of, or access to personal, sensitive or proprietary information, including personally identifiable information, protected health information, or other patient information, or that prevents access to patient information, as well as the perception that any of the foregoing has occurred, could harm our reputation, compel us to comply with federal and/or state breach notification laws and foreign law equivalents, subject us to mandatory corrective action, cause us to provide other notification or take other steps in response to such breach or violation, require us to verify the correctness of database contents and otherwise subject us to litigation, claims, investigations, penalties or other liability under laws and regulations that protect personal data, any of which could disrupt our business and/or result in increased costs or loss of revenue. The effects of a security breach or privacy violation could be further amplified during the current COVID-19 pandemic. Moreover, the prevalent use of mobile devices that access confidential information increases the risk of data security breaches, which could lead to the loss of confidential information, trade secrets or other intellectual property.

Despite significant efforts to create security barriers to the above described threats, it is impossible for us to entirely mitigate these risks. We may be unable to anticipate or prevent techniques used to obtain unauthorized access or to compromise our systems because they change frequently and are generally not detected until after an incident has occurred. If a compromise or other security incident were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations. For example, the loss of clinical trial data from completed, ongoing or future clinical 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 systems, or inappropriate use, disclosure or modification of confidential or proprietary information, we could incur liability and the further development and commercialization of our product candidates could be delayed. While we have invested, and continue to invest, in the protection of our data and information technology infrastructure, there can be no assurance that our efforts will prevent service interruptions, or prevent or identify vulnerabilities or breaches in our systems, that could adversely affect our business and operations and/or result in the loss of critical or sensitive information. Any such interruptions or breaches, or the perception any have occurred, could result in financial, legal, business or reputational harm to us. In addition, our liability insurance may not be sufficient in type or amount to cover us against claims related to security breaches, cyberattacks and other related privacy and security breaches or incidents.

Data collection is governed by restrictive regulations governing the use, processing and cross-border transfer of personal information.

As we conduct our clinical trials and continue to enroll patients in our current and future clinical trials, we may be subject to additional restrictions relating to privacy, data protection and data security. The collection, use, storage, disclosure, transfer, or other processing of personal data regarding individuals in the European Union, or EU, including personal health data, is subject to the EU General Data Protection Regulation, or GDPR. The GDPR is wide-ranging in scope and imposes numerous requirements on companies that process personal data, including requirements relating to processing health and other sensitive data, obtaining consent of the individuals to whom the personal data relates, providing information to individuals regarding data processing activities, implementing safeguards to protect the security and confidentiality of personal data, providing notification of data breaches, and taking certain measures when engaging third-party processors. The GDPR also imposes strict rules on the transfer of personal data to countries outside the EU, including the United States, and permits data protection authorities to impose large penalties for violations of the GDPR, including potential fines of up to €20 million or 4% of annual global revenues, whichever is greater. The GDPR also confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR. In addition, the GDPR includes restrictions on cross-border data transfers. Certain aspects of cross-border data transfers under the GDPR are uncertain as the result of legal proceedings in the EU, including a July 2020 decision by the Court of Justice for the European Union that invalidated the EU-U.S. Privacy Shield. This may increase the

complexity of transferring personal data across borders and may require us to review and amend our mechanisms relating to cross-border data transfer. The GDPR increased our responsibility and liability in relation to personal data that we process where such processing is subject to the GDPR, and we may be required to put in place additional mechanisms to ensure compliance with the GDPR, including as implemented by individual countries. Compliance with the GDPR will be a rigorous and time-intensive process that may increase our cost of doing business or require us to change our business practices, and despite those efforts, there is a risk that we may be subject to fines and penalties, litigation, and reputational harm in connection with our European activities.

Further, the exit of the United Kingdom, or UK, from the EU, referred to as Brexit, has created uncertainty with regard to data protection regulation in the UK. The UK has exited the EU and has implemented legislation similar to the GDPR, referred to as the UK GDPR, which provides for fines of up to the greater of up to the greater of £17.5 million or 4% of global turnover. The relationship between the UK and the EU in relation to certain aspects of data protection law remains unclear, however, including with respect to cross-border data transfers and the role of the UK Information Commissioner's Office with respect to the EU, which exposes us to further compliance risk. We may incur liabilities, expenses, costs, and other operational losses under the UK GDPR, the GDPR and other privacy and data protection laws in the UK and the EU in connection with any measures we take to comply with them.

In addition, California has enacted the California Consumer Privacy Act, or CCPA, which creates new individual privacy rights for California consumers (as defined in the law) and places increased privacy and security obligations on entities handling personal data of consumers or households. The CCPA requires covered companies to provide new disclosure to consumers about such companies' data collection, use and sharing practices, provide such consumers new ways to opt-out of certain sales or transfers of personal information, and provide consumers with additional causes of action. The CCPA went into effect on January 1, 2020, and the California Attorney General commenced enforcement actions for violations on July 1, 2020. In November 2020, California passed the California Privacy Rights Act (CPRA), which amends and expands the CCPA. While most of the substantive provisions in CPRA will not take effect until 2023 and although the CCPA includes exemptions for certain clinical trial data, the law may increase our compliance costs and potential liability with respect to other personal information we may collect about California consumers. Additionally, other states have proposed or enacted laws addressing privacy and security that impose obligations similar to those of the CCPA. In March 2021, Virginia enacted the Virginia Consumer Data Protection Act, or CDPA, which becomes effective on January 1, 2023, and on June 8, 2021, Colorado enacted the Colorado Privacy Act, or CPA, which takes effect on July 1, 2023. The CDPA and CPA share similarities with the CCPA, the CPRA, and legislation proposed in other states. The CCPA, CPRA, and other evolving state privacy legislation may impact our business activities and exemplifies the vulnerability of our business to the evolving regulatory environment related to personal data and protected health information.

Compliance with U.S. and international data protection laws and regulations could require us to take on more onerous obligations in our contracts, restrict our ability to collect, use and disclose data, or in some cases, impact our ability to operate in certain jurisdictions. Any actual or alleged failure to comply with U.S. or international laws and regulations relating to privacy, data protection, and data security could result in governmental investigations, proceedings and enforcement actions (which could include civil or criminal penalties), private litigation or adverse publicity, harm to our reputation, and could negatively affect our operating results and business. Moreover, clinical trial subjects about whom we or our potential collaborators obtain information, as well as the providers who share this information with us, may contractually limit our ability to use and disclose the information or impose other obligations or restrictions in connection with our use, retention and other processing of information, and we may otherwise face contractual restrictions applicable to our use, retention, and other processing of information. Claims that we have violated individuals' privacy rights, failed to comply with data protection laws, 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.

Risks Relating to Ownership of Our Common Stock

We and certain of our directors and executive officers have been named as defendants in lawsuits that could result in substantial costs and divert management's attention.

As described elsewhere in this report in "Part I, Item 3—Legal Proceedings," we and certain of our executive officers and directors have been named as defendants in class action lawsuits that generally allege that we and certain of our officers and directors violated Sections 10(b) and/or 20(a) of the Exchange Act and Rule 10b-5 promulgated thereunder by making allegedly false and/or misleading statements and omitted material adverse facts regarding the Company's business. These complaints seek unspecified compensatory and punitive damages, and reasonable costs and expenses, including attorneys' fees. As of the date of this report, we are unable to predict the outcome of these matters. Although we have insurance, it provides for a substantial retention of liability and is subject to limitations and may not cover a significant portion, or any, of the expenses we may incur or be subject to in connection with class action lawsuit or other litigation to which we are party. Moreover, any conclusion of these matters in a manner adverse to us and for which we incur substantial costs or damages not covered by our directors' and officers' liability insurance would have a material adverse effect on our financial condition and business. In addition, the litigation has caused and will continue to cause our management and board of directors to divert time and attention to the litigation and could adversely impact our reputation and further divert management and our board of directors' attention and resources from other priorities, including the execution of our business plan and strategies that are important to our ability to grow our business and advance our product candidates, any of which could have a material adverse effect on our business. In addition, additional lawsuits may be filed, the conclusion of which in a manner adverse to us and for which we incur substantial costs or damages not covered by our directors' and officers' liability insurance would have a material adverse effect on our financial condition and business.

Actions of an activist stockholder against us have been disruptive and costly and the notice the activist stockholder has sent indicating he will wage a proxy contest and seek representation on our board of directors could cause uncertainty about the strategic direction of our business.

On February 25, 2022, Mr. Richard A. Kayne announced his intention to nominate himself and one other candidate for election to our board of directors at our 2022 annual meeting of stockholders. Mr. Kayne's stated reasons for nominating himself and one other candidate for election to our board of directors, include his request for a formal consulting relationship between Athira and Dr. Kawas, our former president and chief executive officer; the immediate termination of Dr. Litton as our chief executive officer (or the commencement of a search process to find Dr. Litton's replacement); and various changes in the manner in which we were pursuing our clinical trials. Mr. Kayne also expressed concerns over capital allocation matters.

We strive to maintain constructive communications with our stockholders, including Mr. Kayne, and welcome his views and opinions with the goal of enhancing value for all stockholders. However, an activist campaign that seeks to replace members of our board of directors and/or changes our strategic direction could have an adverse effect on us because:

- responding to actions by Mr. Kayne and any other activist stockholders can disrupt our operations, are costly and time-consuming, and divert the attention of our board of directors and senior management team from the pursuit of business strategies, which could adversely affect our results of operations and financial condition;
- perceived uncertainties as to our future direction as a result of changes to the composition of our board of directors may lead to the perception of a change in the direction of the business, instability or lack of continuity which may be exploited by our competitors, may result in the loss of potential business opportunities, cause concern for those enrolling in our clinical trials, and make it more difficult to attract and retain qualified personnel and business partners;
- Mr. Kayne's proposal may interfere with our efforts to raise capital;

- Mr. Kayne's actions and similar types of actions could cause significant fluctuations in our stock price based on temporary or speculative market perceptions or other factors that do not necessarily reflect the underlying fundamentals and prospects of our business;
- as a result of the pending proxy contest, or if other activist stockholder activities ensue, our business could be adversely affected because responding to proxy contests can be disruptive, costly, and time-consuming; and
- if individuals are elected to our board of directors with a specific agenda, it may adversely affect our ability to effectively implement our business strategy and to create additional value for our stockholders.

At this time, we cannot be certain if Mr. Kayne's proxy contest will be successful. Even if Mr. Kayne's proxy contest is not successful, the increased costs we must bear and the distraction of our board of directors and senior management will negatively impact our business, though we cannot predict with certainty the extent of such negative impacts.

We do not know whether an active market for our common stock will be sustained, and, as a result, it may be difficult for you to sell your shares of our common stock.

If an active market for our common stock is not sustained, it may be difficult for you to sell your shares of common stock at an attractive price or at all. We cannot predict the prices at which our common stock will trade. It is possible that in one or more future periods our results of operations and progression of our product pipeline may not meet the expectations of public market analysts and investors, and, as a result of these and other factors, the price of our common stock may fall.

The market price of our common stock may be volatile, which could result in substantial losses for investors.

The market price of our common stock may be volatile. As a result, you may not be able to sell your common stock at or above the price that you paid for such shares. Some of the factors that may cause the market price of our common stock to fluctuate include:

- results of nonclinical studies and clinical trials and, in particular, our LIFT-AD, ACT-AD, and SHAPE clinical trials;
- the ongoing impact of the COVID-19 pandemic on our business;
- the success of existing or new competitive products or technologies;
- the timing and results of clinical trials for our current product candidates and any future product candidates that we may develop;
- commencement or termination of collaborations for our product candidates;
- failure or discontinuation of any of our product candidates;
- results of nonclinical studies, clinical trials or regulatory approvals of product candidates of our competitors, or announcements about new research programs or product candidates of our competitors;
- investor reactions to other companies' drug development results, including product failures or negative responses from regulatory authorities;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;

- negative press coverage;
- the status of ongoing litigation and potential commencement of additional litigation;
- the results of the investigation by the independent special committee of the board of directors and the separate ongoing investigation by WSU;
- the level of expenses related to any of our research programs, product candidates that we may develop;
- the results of our efforts to develop additional product candidates or products;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us, our insiders, or other stockholders;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in estimates or recommendations by securities analysts, if any, that cover our stock;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- direct or indirect impacts on our business, our suppliers and other third parties and our clinical sites as a result of geopolitical events, including the Russia-Ukraine war;
- general economic, industry, and market conditions; and
- the other factors described in this “Part I, Item 1A—Risk Factors” section.

In recent years, the stock market in general, and the market for pharmaceutical and biotechnology companies in particular, has experienced significant price and volume fluctuations that have often been unrelated or disproportionate to changes in the operating performance of the companies whose stock is experiencing those price and volume fluctuations. Broad market and industry factors may seriously affect the market price of our common stock, regardless of our actual operating performance. Following periods of such volatility in the market price of a company’s securities, securities class action litigation has often been brought against that company. Because of the potential volatility of our stock price, we may become the target of securities litigation in the future. Securities litigation could result in substantial costs and divert management’s attention and resources from our business.

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

Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares of common stock intend to sell shares, could reduce the market price of our common stock. In addition, shares issued upon the exercise of stock options outstanding under our equity incentive plans or pursuant to future awards granted under those plans will become available-for-sale in the public market to the extent permitted by the provisions of applicable vesting schedules, any applicable market standoff and lock-up agreements, and Rule 144 and Rule 701 under the Securities Act of 1933, as amended, or the Securities Act.

Moreover, as of February 28, 2022, the holders of approximately 3.7 million shares of our common stock are eligible to exercise certain rights, subject to various conditions and limitations, 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. We also register 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 and once vested, subject to volume limitations applicable to affiliates. If any of these additional shares are sold, or if it is perceived that they will be sold, in the public market, the market price of our common stock could decline.

Our directors, executive officers and 5% stockholders own a significant percentage of our common stock, which could limit your ability to affect the outcome of key transactions, including a change of control.

Our directors, executive officers, significant holders of our outstanding common stock and their respective affiliates beneficially own a significant amount of our outstanding common stock as of December 31, 2021. As a result, these stockholders, if they act together, will be able to influence our management and affairs and all matters requiring stockholder approval, including the election of directors and approval of significant corporate transactions. This concentration of ownership may have the effect of delaying or preventing a change in control of our company and might affect the market price of our common stock.

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 Jumpstart Our Business Startups Act of 2012, or the JOBS Act. For so long as we remain an emerging growth company, we are permitted and plan to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include not being required to comply with the auditor attestation requirements of SOX Section 404, not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements, 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. As a result, the information we provide stockholders will be different than the information that is available with respect to other public companies. We cannot predict whether investors will find our common stock less attractive if we 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 price may be more volatile.

Failure to build our finance infrastructure and improve our accounting systems and controls could impair our ability to comply with the financial reporting and internal controls requirements for publicly traded companies.

As a public company, we operate in an increasingly demanding regulatory environment, which requires us to comply with the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, the regulations of the Nasdaq Global Select Market, the rules and regulations of the Securities and Exchange Commission, expanded disclosure requirements, accelerated reporting requirements and more complex accounting rules. Company responsibilities required by the Sarbanes-Oxley Act include establishing corporate oversight and adequate internal control over financial reporting and disclosure controls and procedures. Effective internal controls are necessary for us to produce reliable financial reports and are important to help prevent financial fraud. We must perform system and process evaluation and testing of our internal controls over financial reporting to allow management to report on the effectiveness of our internal controls over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act. We may experience difficulty in meeting these reporting requirements in the future.

The process of building our accounting and financial functions and infrastructure has required and will continue to require significant additional professional fees, internal costs and management efforts. Any disruptions or difficulties in implementing or using such a system could adversely affect our controls and harm our business. Moreover, such disruption or difficulties could result in unanticipated costs and diversion of management attention. In addition, we may discover weaknesses in our system of internal financial and

accounting controls and procedures that could result in a material misstatement of our financial statements. Our internal control over financial reporting will not prevent or detect all errors and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system's objectives will be met. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud will be detected.

If we are not able to comply with the requirements of Section 404 of the Sarbanes-Oxley Act in a timely manner, or if we are unable to maintain proper and effective internal controls, we may not be able to produce timely and accurate financial statements. If we cannot provide reliable financial reports or prevent fraud, our business and results of operations could be harmed, investors could lose confidence in our reported financial information and we could be subject to sanctions or investigations by Nasdaq, the SEC or other regulatory authorities.

Anti-takeover provisions in our charter documents and under Delaware or Washington law could make an acquisition of us difficult, limit attempts by our stockholders to replace or remove our current management and limit our stock price.

Provisions of our certificate of incorporation and bylaws may delay or discourage transactions involving an actual or potential change in our control or change in our management, including transactions in which stockholders might otherwise receive a premium for their shares, or transactions that our stockholders might otherwise deem to be in their best interests. Therefore, these provisions could adversely affect the price of our common stock. Among other things, the certificate of incorporation and bylaws:

- permit the board of directors to issue up to 100,000,000 shares of preferred stock, with any rights, preferences and privileges as they may designate;
- provide that the authorized number of directors may be changed only by resolution of the board of directors;
- provide that all vacancies, including newly-created directorships, may, except as otherwise required by law, be filled by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- divide the board of directors into three classes;
- provide that a director may only be removed from the board of directors by the stockholders for cause;
- require that any action to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and may not be taken by written consent;
- provide that stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide notice in writing in a timely manner, and meet specific requirements as to the form and content of a stockholder's notice;
- prevent cumulative voting rights (therefore allowing the holders of a plurality of the shares of common stock entitled to vote in any election of directors to elect all of the directors standing for election, if they should so choose);
- provide that special meetings of our stockholders may be called only by the chairman of the board, our chief executive officer or by the board of directors; and
- provide that stockholders are permitted to amend the bylaws only upon receiving at least two-thirds of the total votes entitled to be cast by holders of all outstanding shares then entitled to vote generally in the election of directors, voting together as a single class.

In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which generally prohibits a Delaware corporation from

engaging in any of a broad range of business combinations with any "interested" stockholder for a period of three years following the date on which the stockholder became an "interested" stockholder. Likewise, because our principal executive offices are located in Washington, the anti-takeover provisions of the Washington Business Corporation Act may apply to us under certain circumstances now or in the future. These provisions prohibit a "target corporation" from engaging in any of a broad range of business combinations with any stockholder constituting an "acquiring person" for a period of five years following the date on which the stockholder became an "acquiring person."

Our bylaws provide that the Court of Chancery of the State of Delaware and the federal district courts of the United States are the exclusive forums for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our bylaws provide that the Court of Chancery of the State of Delaware will be the exclusive forum for any derivative action or proceeding brought on our behalf; any action asserting a breach of fiduciary duty; any action asserting a claim against us arising under the Delaware General Corporation Law, our certificate of incorporation or our bylaws; any action to interpret, apply, enforce or determine the validity of our certificate of incorporation or our bylaws; and any action asserting a claim against us that is governed by the internal affairs doctrine. This provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act or any other claim for which the U.S. federal courts have exclusive jurisdiction.

Our bylaws further provide that the federal district courts of the United States will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. The enforceability of similar exclusive federal forum provisions in other companies' organizational documents has been challenged in legal proceedings, and while the Delaware Supreme Court has ruled that this type of exclusive federal forum provision is facially valid under Delaware law, there is uncertainty as to whether other courts would enforce such provisions and that investors cannot waive compliance with the federal securities laws and the rules and regulations thereunder.

These exclusive forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. Alternatively, if a court were to find either exclusive forum provision in our bylaws to be inapplicable or unenforceable in an action, we may incur further significant additional costs associated with resolving such action in other jurisdictions, all of which could have a material adverse effect on our business, financial condition, and results of operations.

General Risk Factors

Our advisors and consultants are classified as independent contractors, and we can face consequences if it is determined that they are misclassified as such.

There is often uncertainty in the application of worker classification laws, and consequently there is risk to us that our independent contractors could be deemed to be misclassified under applicable law. The tests governing whether a service provider is an independent contractor or an employee are typically highly fact sensitive and can vary by governing law. Laws and regulations that govern the status and misclassification of independent contractors are also subject to divergent interpretations by various authorities, which can create uncertainty and unpredictability. A misclassification determination or allegation creates potential exposure for us, including but not limited to monetary exposure arising from or relating to failure to withhold and remit taxes, unpaid wages, and wage and hour laws and requirements (such as those pertaining to minimum wage and overtime); claims for employee benefits, social security, workers' compensation and unemployment; claims of discrimination, harassment, and retaliation under civil rights laws; claims under laws pertaining to unionizing, collective bargaining, and other concerted activity; and other claims, charges, or other proceedings under laws and regulations applicable to employers and employees, including risks relating to allegations of joint employer liability. Such claims could result in monetary damages (including but not limited to wage-based damages or restitution, compensatory

damages, liquidated damages, and punitive damages), interest, fines, penalties, costs, fees (including but not limited to attorneys' fees), criminal and other liability, assessment, or settlement. Such an allegation, claim, adverse determination, including but not limited to with respect to advisors and consultants that provide services to us could also harm our brand and reputation, which could adversely impact our business.

If securities analysts do not publish research or reports about our business or if they publish negative evaluations of our stock, the price of our stock could decline.

The trading market for our common stock will rely in part on the research and reports that industry or financial analysts publish about us or our business. If no or few analysts commence coverage of us, the trading price of our stock could decrease. Even if we do obtain analyst coverage, if one or more of the analysts covering our business downgrade their evaluations of our stock, the price of our stock could decline. If one or more of these analysts cease to cover our stock, we could lose visibility in the market for our stock, which in turn could cause our stock price to decline.

We will continue to 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 Select 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. We have hired, and we expect that we will continue to need to hire, additional accounting, finance, and other personnel in connection with our efforts to comply with the requirements of being a public company, and our management and other personnel will need to devote a substantial amount of time towards maintaining compliance with these requirements. These requirements will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, we expect that the rules and regulations applicable to us as a public company may make it more difficult and more expensive for us to obtain director and officer liability insurance, which could make it more difficult for us to attract and retain qualified members of our board of directors. We are currently 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.

If we are unable to maintain effective internal controls, our business, financial position and results of operations could be adversely affected.

As a public company, we are subject to reporting and other obligations under the Securities Exchange Act of 1934, as amended, or the Exchange Act, including the requirements of SOX Section 404, which require annual management assessments of the effectiveness of our internal control over financial reporting.

The rules governing the standards that must be met for management to determine that our internal control over financial reporting is effective are complex and require significant documentation, testing and possible remediation to meet the detailed standards under the rules. During the course of its testing, our management may identify material weaknesses or deficiencies which may not be remedied in time to meet the deadline imposed by the Sarbanes-Oxley Act of 2002. These reporting and other obligations place significant demands on our management and administrative and operational resources, including accounting resources.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States. Any failure to maintain effective internal controls could have an adverse effect on our business, financial position and results of operations.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

Our corporate headquarters is located in Bothell, Washington, where we currently lease approximately 19,326 square feet of laboratory and office space, which leases expire in August 2027. We believe these facilities will be adequate for the foreseeable future and that suitable additional or substitute space will be available as and when needed.

Item 3. Legal Proceedings.

From time to time, we are subject to various legal proceedings or claims that arise in the ordinary course of business. The following is a brief description of the more significant legal proceedings.

Securities Class Actions

On June 25, 2021, plaintiffs Fan Wang and Hang Gao filed a putative securities class action lawsuit in the U.S. District Court for the Western District of Washington against us and our former Chief Executive Officer, Dr. Leen Kawas, captioned *Wang v. Athira Pharma, Inc., et al.*, No. 2:21-cv-00861. Plaintiffs Wang and Gao assert claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 and SEC Rule 10b-5, alleging that the defendants made materially false and misleading statements and omitted material adverse facts regarding our business. Specifically, the *Wang* plaintiffs allege that we failed to disclose to investors that certain research conducted by Dr. Kawas was allegedly tainted by scientific misconduct during her doctoral work at Washington State University, or WSU, including the manipulation of data, and that as a result, the defendants' positive statements about our business, operations, and prospects were materially misleading. The *Wang* plaintiffs seek unspecified compensatory and punitive damages, and reasonable costs and expenses, including attorneys' fees.

That same day, on June 25, 2021, plaintiff Harshdeep Jawandha filed a putative securities class action lawsuit in the U.S. District Court for the Western District of Washington against us, Dr. Kawas, the Company's Chief Financial Officer, certain members of our board of directors at the time of our IPO, as well as the IPO underwriters, captioned *Jawandha v. Athira Pharma, Inc., et al.*, No. 2:21-cv-00862. The *Jawandha* complaint asserts violations of Sections 11 and 15 of the Securities Act of 1933, alleging that that our IPO registration statement was materially false and misleading because it omitted to state that certain of Dr. Kawas's published doctoral research papers at WSU contained allegedly improperly altered images, that the research was allegedly foundational to Athira's efforts to develop treatments for Alzheimer's, that, as a result, and that the defendants' positive statements about our business, operations, and prospects were materially misleading. The plaintiff seeks unspecified compensatory damages, and reasonable costs and expenses, including attorneys' fees.

Also on June 25, 2021, plaintiffs Timothy Slyne and Tai Slyne filed a putative securities class action lawsuit in the U.S. District Court for the Western District of Washington against us, Dr. Kawas, our Chief Financial Officer, and the same members of our board of directors and underwriters as in the *Jawandha* complaint, captioned *Slyne v. Athira Pharma, Inc. et al.*, No. 2:21-cv-00864. The *Slyne* complaint asserts violations of Sections 11 and 15 of the Securities Act of 1933, alleging that purported issues with Dr. Kawas's doctoral research at WSU should have been disclosed in our IPO registration statement. The

Slyne plaintiffs seek unspecified compensatory damages, reasonable costs and expenses, including attorneys' fees, and injunctive and other equitable relief.

On August 9, 2021, the Honorable Judge Thomas S. Zilly, the district judge presiding over *Wang v. Athira Pharma, Inc., et al.*, No. 2:21-cv-00861, issued an order consolidating the three cases under that case number. On October 5, 2021, the district court issued an order appointing lead plaintiffs and approved their selection of lead and liaison counsel.

On January 7, 2022, lead plaintiffs filed a consolidated amended complaint, which asserts violations of Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 and SEC Rule 10b-5 and Sections 11, 12, and 15 of the Securities Act of 1933. The consolidated amended complaint is brought against us, Dr. Kawas, our chief financial officer, certain members of our board of directors at the time of our IPO and secondary public offering (SPO), and the IPO and SPO underwriters. As with the previous complaints, it is based on allegations that the IPO and SPO registration statements and/or other public statements were materially false and misleading because they omitted to state that certain of Dr. Kawas's published doctoral research papers at WSU contained allegedly improperly altered images. Lead plaintiffs seek unspecified compensatory damages, equitable and injunctive relief, and reasonable costs and expenses, including attorneys' fees, on behalf of themselves and the purported class. On March 8, 2022, the defendants filed a motion to dismiss lead plaintiffs' consolidated amended complaint for failure to state a claim under the federal securities laws.

We cannot predict the outcome of these suits. Failure by us to obtain a favorable resolution of these suits could have a material adverse effect on our business, results of operations and financial condition.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information for Common Stock

Our common stock began trading on The Nasdaq Global Select Market under the symbol "ATHA" on September 18, 2020. Prior to that date, there was no public trading market for our common stock.

Holders of Record

As of March 21, 2022, there were approximately 49 holders of record of our common stock. Because many of our shares are held by brokers and other institutions on behalf of shareholders, we are unable to estimate the total number of shareholders represented by these record holders.

Dividend Policy

We currently intend to retain all available funds and future earnings to fund the development and growth of our business and we do not anticipate paying any cash dividends in the foreseeable future.

Recent Sales of Unregistered Securities

None.

Stock Performance Graph

As a smaller reporting company, we are not required to provide the information requested by this item pursuant to Item 201(e) of Regulation S-K.

Issuer Repurchases of Equity Securities

None.

Item 6. [Reserved].

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

You should read the following management's discussion and analysis of financial condition and results of operations in conjunction with our consolidated financial statements and notes thereto included in Part II, Item 8 of this Annual Report on Form 10-K. This discussion and analysis and other parts of this report contain forward-looking statements based upon current beliefs, plans and expectations related to future events and our future financial performance that involve risks, uncertainties and assumptions, such as statements regarding our intentions, plans, objectives, expectations, forecasts and projections. Our actual results and the timing of selected events could differ materially from those anticipated in these forward-looking statements as a result of several factors, including those set forth under the section of this Annual Report on Form 10-K titled "Risk Factors" and elsewhere in this report. You should carefully read the "Risk Factors" to gain an understanding of the important factors that could cause actual results to differ materially from our forward-looking statements. Please also see the section of this report titled "Special Note Regarding Forward-Looking Statements."

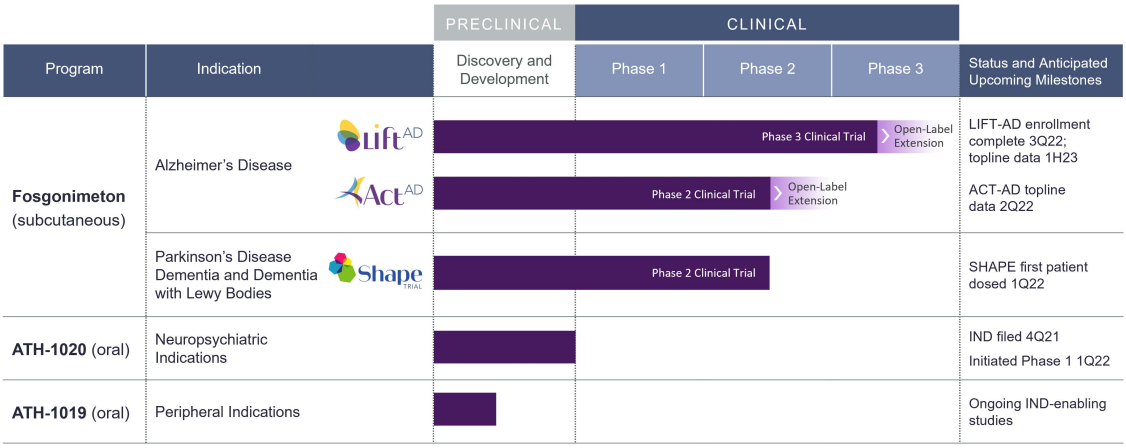
Overview

We are a late clinical-stage biopharmaceutical company focused on developing small molecules to restore neuronal health and slow neurodegeneration. With our product candidates, we aim to provide rapid cognitive improvement and alter the course of neurological diseases, leveraging our novel mechanism of action. Our approach is designed to augment neuronal growth factor signaling through the hepatocyte growth factor/MET, or HGF/MET, a naturally occurring, repair and regenerative system. We believe enhancing HGF/MET signaling has the potential to protect existing neurons from damage, reduce inflammation, promote regeneration, and benefit brain physiology. We anticipate that all of these characteristics may improve neuronal health and translate into clinical benefits. Our pipeline is built from our proprietary drug discovery platform, or ATH platform, and consists of a series of small molecules that are designed to target either (1) the central nervous system, or CNS, by crossing the blood brain barrier, or BBB, or (2) the peripheral nervous system.

Our lead candidate, fosgonimeton (ATH-1017), is a subcutaneously administered, BBB-penetrating, small molecule HGF/MET positive modulator. The primary target indication is Alzheimer's disease (AD). In our Phase 1a/b clinical trial, fosgonimeton was well tolerated in healthy young and elderly volunteers and AD subjects, without serious adverse events. This clinical trial recruited 88 subjects, including 11 AD subjects with mild-to-moderate AD, who were randomly assigned to active and control groups. Nonclinical studies and Phase 1 clinical trials with fosgonimeton demonstrated improvements in brain network activity indicating potentially positive effects on brain function. In AD subjects, multiple dosing of fosgonimeton significantly improved Event Related Potential (ERP) P300 latency. ERP P300 latency is a functional measure that is highly correlated with cognition; however, we have not yet established a connection between these ERP P300 latency results and improved cognition. In September 2020, we began site initiation and patient screening for LIFT-AD, our Phase 2/3 clinical trial with fosgonimeton designed with the potential to provide pivotal data in support of registration, for the treatment of mild-to-moderate AD, with topline results expected in the first half of 2023. In November 2020, we also initiated ACT-AD, a proof-of-concept Phase 2 clinical trial with ERP P300 latency as the primary endpoint, in mild-to-moderate AD, which trial is designed to better characterize the overall effects of fosgonimeton on working memory processing speed and cognitive measures, with topline results expected in the second quarter of 2022. In July 2021, we announced that we are enrolling patients into a 26-week open-label extension study for our LIFT-AD and ACT-AD clinical trials, which will allow us to collect up to a total of one year of safety data with fosgonimeton. In October 2021, we announced that we completed patient enrollment in our ACT-AD clinical trial. In January 2022, we increased the LIFT-AD study sample size by approximately 120 participants, from 300 to 420, to strengthen the statistical power of co-key secondary endpoints, including ADAS-Cog11.

The following figure illustrates the current development stage of our ATH compounds and discovery and development programs. In addition, we are expanding our ATH platform to additional indications in the CNS and peripheral nervous system as we aim to improve neuronal health in multiple disorders. Our drug

discovery efforts are focused on exploring the potential of ATH technology, which is designed to promote HGF/MET activity for a variety of clinical applications.



The fosgonimeton LIFT-AD Phase 3 clinical trial may provide pivotal data in support of registration with the FDA.

We constantly strive to grow and optimize our portfolio through in-house discovery and plan on additional external business development activities enabled by our innovative internal research and development capabilities.

We were incorporated in March 2011 and since our inception, we have devoted substantially all of our resources to our research and development efforts such as small molecule compound discovery, nonclinical studies and clinical trials, as well as manufacturing activities, establishing and maintaining our intellectual property portfolio, hiring personnel, raising capital, and providing general and administrative support for these operations. We do not have any products approved for commercial sale, and we have not generated any revenues related to our products since inception. Our ability to generate product revenue sufficient to achieve profitability, if ever, will depend on the successful development of one or more of our product candidates which we expect will take a number of years.

We are focused on the development of small molecule therapeutics which enables us to use well-established and widely available manufacturing processes and infrastructure, formulation compositions and drug administration technologies or devices. We do not currently operate our own facilities for manufacturing, storing, or distributing our product candidates. We utilize third-party contract manufacturing organizations, or CMOs, to manufacture and supply our preclinical and clinical materials during the development of our product candidates. We believe the synthesis of fosgonimeton is reliable and reproducible and the synthetic methods can be further optimized to enable large-scale production that continues to avoid use of toxic materials or specialized equipment or handling during the manufacturing process. We plan to continue to optimize the manufacturing process to support future large-scale and commercial supply. Our goal is to identify and develop small molecule product candidates that are cost-effective to manufacture and easily transferable to third party CMOs. We expect to use similar contract resources for commercialization of our products, at least until our resources and operations are at a scale that justifies investment in internal manufacturing capabilities.

Given our stage of development, we have not yet established a commercial organization or distribution capabilities. We intend to build a commercial infrastructure to support sales of our product candidates. We expect to manage sales, marketing and distribution through internal resources and third-party relationships. While we may commit significant financial and management resources to commercial activities, we will also consider collaborating with one or more pharmaceutical companies to enhance our commercial capabilities.

To date, we have funded our operations primarily through proceeds from the sale of equity securities, including proceeds from the sale and issuance of common stock in our IPO and in a subsequent follow-on public offering, the sale and issuance of convertible preferred stock, common stock warrants, and convertible notes, and to a lesser extent from grant income and stock option exercises. From inception to December 31, 2021, we have raised aggregate net cash proceeds of approximately $407.4 million primarily from the issuance of our common stock, convertible preferred stock, common stock warrants, and convertible notes. We have incurred significant operating losses to date. Our net losses were $54.9 million and $19.9 million for the years ended December 31, 2021 and 2020, respectively. As of December 31, 2021, we had an accumulated deficit of $95.9 million and cash, cash equivalents and investments of $319.7 million.

We expect to continue to incur increasing operating losses for the foreseeable future as we:

- continue to advance fosgonimeton and our other product candidates through preclinical studies and clinical trials, and potentially further extend the open label extension of the ACT-AD and LIFT-AD trials;
- expand our pipeline of product candidates;
- continue to grow our discovery organization and invest in the ATH platform;
- ramp up manufacturing activities;
- attract, hire and retain additional personnel;
- obtain, maintain, expand and protect our intellectual property portfolio;
- operate as a public company;
- expand our laboratory and office facilities;
- implement operational, financial and management information systems;
- seek regulatory approval for any product candidates that successfully complete clinical trials;
- establish a sales, marketing and distribution infrastructure to commercialize any product candidate for which we may obtain marketing approval; and
- incur legal expenses associated with ongoing litigation, as further described in “Part I, Item 3—Legal Proceedings,” and elsewhere in this report.

Our net losses may fluctuate significantly from quarter-to-quarter and year-to-year, depending on the timing of our clinical trials and our expenditures on other research and development activities.

We will require substantial additional funding to support our continuing operations and further the development 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 the sale of equity, debt financings, or other capital sources, which could include income from collaboration, licensing or similar arrangements, for the foreseeable future. Adequate funding may not be available when needed or on terms acceptable to us, or at all. If we are unable to raise additional capital as needed, we may have to significantly delay, scale back or discontinue development of our product candidates. Our ability to raise additional funds may be adversely impacted by potential worsening global economic conditions and the recent disruptions to, and volatility in, the credit and financial markets in the United States and worldwide resulting from the COVID-19 pandemic and otherwise. If we fail to obtain necessary capital when needed on acceptable terms, or at all, it could force us to delay, limit, reduce or terminate our product development programs, commercialization efforts or other operations. Insufficient liquidity may also require us to relinquish rights to product candidates at an earlier stage of development or on less favorable terms than we would otherwise choose. We cannot assure you that we will ever be profitable or generate positive cash flow from operating activities. Based upon our current operating plan, we estimate that our existing cash, cash equivalents and investments will be sufficient to fund our operating expenses and capital expenditure requirements through at least the next 12 months following the date of this report.

The global COVID-19 pandemic continues to evolve, and we will continue to monitor the COVID-19 situation closely. While COVID-19 related restrictions have been eased in many locations around the globe, including in Bothell, Washington, where our principal offices are located, a resurgence in cases of COVID-19 or similar health epidemic could occur at any time, and the ultimate impact of the COVID-19 pandemic or a similar health epidemic is highly uncertain and subject to change. In particular, new and highly contagious variants of COVID-19 continue to emerge and spread quickly throughout certain areas of the United States and elsewhere, and at this point we are unable to determine when and to what extent any such resurgence will affect our business. We will continue to actively monitor the evolving situation and ongoing impacts on our clinical trial enrollment, trial sites, contract research organizations, or CROs, third-party manufacturers, and other third parties with whom we do business, as well as on regulatory authorities and our key scientific and management personnel. As the situation evolves, we may take further actions that alter our operations, including those that may be required by federal, state or local authorities, or that we determine are in the best interests of our employees and other third parties with whom we do business. At this point, the ultimate extent to which the COVID-19 pandemic, or any potential resurgence of a variant thereof, may affect our business, operations and clinical development timelines and plans, including the resulting impact on our expenditures and capital needs, remains uncertain.

Our Collaboration and Grant Agreements

Amended and Restated Washington State University License Agreement

We are party to an amended and restated exclusive license agreement with Washington State University ("WSU") that we entered into in September of 2015. Under this agreement, WSU granted us an exclusive license to make, use, sell, and offer for sale products covered by certain of the licensed patents, including dihexa, the chemical compound into which fosgonimeton metabolizes following administration. The term of the license continues until the earlier of the date in which no valid claim remains enforceable and the payment of royalties ceases for more than four consecutive quarters after such royalty payments begin.

The initiation of our first Phase 2 clinical trial in September 2020 triggered a $50,000 liability to WSU, which was repaid in full as of December 31, 2020.

We are obligated to pay to WSU the following if the related milestones are reached:

- $300,000 – At initiation of the first Phase 3 clinical trial in the United States, European Union or Japan for the first licensed product.
- $600,000 – Marketing approval in the United States, European Union or Japan for the first licensed product.

We are obligated to pay WSU a royalty in the mid-single digits of net sales.

Additionally, under the agreement we have the right to sublicense the licensed rights, subject to additional payments to WSU for sublicense consideration received. Such amounts are dependent on the terms of the underlying sublicense, and range from the mid-single digits to mid tens of any non-sales based payments received, and low twenties of net sales based sublicense royalties.

Grant Liability

In 2014 and 2015, we received $250,000 and $500,000, respectively, from the Washington Life Sciences Discovery Fund ("LSDF") under the terms of two matching grant award agreements. The consummation of our initial public offering in September 2020 was a triggering event under the terms of the grant and the liability was remeasured to the pay-off amount of $1.5 million as of September 30, 2020 and repaid in full as of December 31, 2020.

National Institutes of Health Grant

In December 2020, we accepted a grant from the National Institutes of Health ("NIH") to support our ACT-AD Phase 2 clinical trial for fosgonimeton. Under the terms of the agreement, we may receive approximately $7.8 million with the potential for an additional $7.4 million up to an aggregate of $15.2 million. For additional information regarding this grant, see the section of this Annual Report on Form 10-K titled "Business—Our Collaboration and Grant Agreements." We recognized $8.8 million and $1.1 million of income related to our NIH grant during the years ended December 31, 2021 and 2020, respectively. During the year ended December 31, 2021, we received cash of $7.6 million in connection with the NIH grant. As of December 31, 2021 and 2020, we had incurred qualifying expenses in excess of cash received of approximately $2.3 million and $1.1 million, respectively, which is included in unbilled grant receivable on the consolidated balance sheets. In February 2022, we received cash of $2.3 million in connection with the unbilled grant receivable balance as of December 31, 2021.

Part the Cloud

In January 2019, the Alzheimer's Association awarded us a $1.0 million Part the Cloud research grant. Grant proceeds must be used to advance our fosgonimeton product candidate in the Alzheimer's disease setting. Reporting of expenses incurred supported by the grant as well as research updates are sent to the Alzheimer's Association semi-annually. Under the terms of the agreement, we received $776,000 in 2019 and received the remaining $224,000 in March 2021 after having completed certain development milestones in October 2020. We recognize income related to the Part the Cloud research grant as qualifying expenses under the grant agreement are incurred. As of December 31, 2020, we had incurred qualifying expenses in excess of cash received of approximately $224,000, which is included in unbilled grant receivable on the consolidated balance sheets.

Components of Operating Results

Operating Expenses

Research and Development

Research and development expenses consist primarily of direct and indirect costs incurred for our research activities, including development of the ATH platform, our drug discovery efforts and the development of our product candidates. Direct costs include laboratory materials and supplies, contracted research and manufacturing, clinical trial costs, consulting fees, and other expenses incurred to sustain our research and development program. Indirect costs include personnel-related expenses, consisting of employee salaries, related benefits, and stock-based compensation expense for employees engaged in research and development activities, and facilities, including expenses associated with relocating to and building out our new lab space, and other expenses consisting of direct and allocated expenses for rent and depreciation, and lab consumables.

We expense research and development costs as incurred. Non-refundable advance payments for goods and services that will be used over time for research and development are capitalized and recognized as goods are delivered or as the related services are performed. In-licensing fees and other costs to acquire technologies used in research and development that have not yet received regulatory approval and that are not expected to have an alternative future use are expensed when incurred. We track direct costs by stage of program, clinical or preclinical. However, we do not track indirect costs on a program specific basis because these costs are deployed across multiple programs and, as such, are not separately classified.

As of the date of this report, we cannot reasonably determine the nature, timing, and estimated costs of the efforts that will be necessary to complete the development of, and obtain regulatory approval for, any of our product candidates. Product candidates in later stages of development generally have higher development costs than those in earlier stages. We expect that our research and development expenses will increase substantially for the foreseeable future as we continue to invest in research and development activities related to developing our product candidates, as our product candidates advance into later stages of development, as we begin to conduct larger clinical trials, as we seek regulatory approvals for any product

candidates that successfully complete clinical trials, as we expand our product pipeline, as we maintain, expand, protect and enforce our intellectual property portfolio, and as we incur expenses associated with hiring additional personnel to support our research and development efforts. In particular, we expect our research and development expenses will increase substantially as we conduct our Phase 2 and Phase 3 clinical trials for fosgonimeton, including the open-label extension for those trials. Additionally, we may experience an overall increase in research and development expenses as a result of inflation.

The process of conducting the necessary clinical research to obtain regulatory approval is costly and time-consuming, and the successful development of our product candidates is highly uncertain. Our research and development expenses may vary significantly based on factors such as:

- the number and scope of preclinical and IND-enabling studies;
- the phases of development of our product candidates;
- the progress and results of our research and development activities;
- per subject trial costs;
- the number of trials required for regulatory approval, in particular with respect to fosgonimeton for the treatment of mild-to-moderate AD;
- the potential to further extend the open label extension of the ACT-AD and LIFT-AD trials;
- the number of sites included in the trials;
- the countries in which the trials are conducted;
- the length of time required to enroll eligible subjects and initiate clinical trials;
- the number of subjects that participate in the trials;
- the drop-out and discontinuation rate of subjects;
- potential additional safety monitoring requested by regulatory agencies;
- the duration of subject participation in the trials and follow-up;
- the cost and timing of manufacturing of our product candidates;
- the receipt of regulatory approvals from applicable regulatory authorities;
- the timing, receipt and terms of any marketing approvals from applicable regulatory authorities;
- the hiring and retention of research and development personnel;
- the degree to which we obtain, maintain, defend and enforce our intellectual property rights;
- the impact of COVID-19 on timelines and clinical operations, which may lead to increased costs; and
- the extent to which we establish collaboration, licensing or similar arrangements and the performance of any related third parties.

A change in the outcome of any of these 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.

General and Administrative

General and administrative expenses consist primarily of personnel-related costs, consisting of employee salaries, related benefits, and stock-based compensation expense for our employees in the executive, legal, finance and accounting, human resources, and other administrative functions. General and administrative expenses also include third-party costs such as legal costs, insurance costs, accounting,

auditing and tax related fees, consulting fees and facilities and other expenses not otherwise included as research and development expenses. We expense general and administrative costs as incurred.

We expect that our general and administrative expenses will increase substantially for the foreseeable future as we increase our headcount to support our continued research activities and development of our programs. We also anticipate that we will incur substantially increased expenses as a result of operating as a public company, including expenses related to compliance with the rules and regulations of the SEC, and those of any national securities exchange on which our securities are traded, legal, auditing, additional insurance expenses, investor relations activities, and other administrative and professional services. We expect an increase in legal expenses related to our ongoing class action litigation and proxy contest. We also expect to continue to increase the size of our administrative function to support the growth of our business. Additionally, we may experience an overall increase in general and administrative expenses as a result of inflation.

Grant Income

Grant income consists of income related to the NIH grant and the Part the Cloud grant, which was completed in 2020. Income from these grants is recognized as qualifying expenses under the grant agreements are incurred. We expect grant income associated with the NIH grant will increase in future years, as we expect qualifying expenses under the grant terms to increase substantially in relation to our continued research activities and development of our programs. Under the terms of the agreement, we may receive approximately $7.8 million, with the potential for an additional $7.4 million, up to an aggregate of $15.2 million.

Other Income (Expense), Net

Other income (expense), net consists of interest earned on our cash, cash equivalents, and investments, periodic mark-to-market gains and losses on the derivative, grant, and convertible preferred stock warrant liabilities carried at fair value, and interest expense on our convertible notes. In the future, we expect investment income to be the primary component of other income, net as the mark-to-market liabilities and convertible notes were all settled in 2020 and will no longer be adjusted to fair value.

Results of Operations

Comparison of the Years Ended December 31, 2021 and 2020

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

	Year Ended December 31,			
	2021	2020	Dollar Change	% Change
	(in thousands)			
Operating expenses:				
Research and development	$ 42,794	$ 13,286	$ 29,508	222 %
General and administrative	21,228	6,709	14,519	216
Total operating expenses	64,022	19,995	44,027	220
Loss from operations	(64,022)	(19,995)	(44,027)	220
Grant income	8,835	1,321	7,514	569
Other income (expense), net	334	(1,281)	1,615	*
Net loss	$ (54,853)	$ (19,955)	$ (34,898)	175

* Not meaningful

Research and Development Expenses

The following table shows the primary components of our research and development expenses for the periods presented:

	Year Ended December 31,			
	2021	2020	Dollar Change	% Change
	(in thousands)			
Direct costs:				
Fosgonimeton (ATH-1017)	$ 34,488	$ 10,648	$ 23,840	224 %
Preclinical programs and other direct costs	2,968	337	2,631	781
Total direct costs	37,456	10,985	26,471	241
Indirect costs:				
Personnel-related costs, including stock-based compensation	4,545	1,831	2,714	147
Facilities and other costs	793	470	323	69
Total research and development expenses	$ 42,794	$ 13,286	$ 29,508	222

Research and development expenses increased by $29.5 million, from $13.3 million for the year ended December 31, 2020 to $42.8 million for the year ended December 31, 2021. The increase was driven primarily by an increase in expenses for fosgonimeton of $23.8 million related to continued patient enrollment and clinical site visit activity for our Phase 2 and Phase 3 clinical trials and the corresponding open-label extension for our Phase 2 and Phase 3 clinical trials, an increase in personnel-related costs of $2.7 million due to an increase in headcount and stock-based compensation expense in connection with awards granted subsequent to our IPO, and an increase in preclinical research and development expenses of $2.6 million for new product candidates.

General and Administrative Expenses

General and administrative expenses increased by $14.5 million, from $6.7 million for the year ended December 31, 2020 to $21.2 million for the year ended December 31, 2021. The increase was primarily due to an increase in personnel-related costs of $5.5 million, due primarily to increases in headcount to support our continued growth and in stock-based compensation expense in connection with awards granted subsequent to our IPO, an increase in legal costs of $3.1 million, which includes costs related to legal proceedings and the board of directors' special committee investigation, an increase in insurance costs of

$2.4 million, an increase in facilities costs of $1.4 million, an increase in business development expenses of $1.1 million, and to a lesser extent, increases in accounting, technical and consulting services expenses.

Grant Income

Grant income increased by $7.5 million, from $1.3 million for the year ended December 31, 2020 to $8.8 million for the year ended December 31, 2021. The increase was solely driven by research progress on our program that is reimbursable by the NIH grant, under which we recognized grant income of $8.8 million. Grant income recognized during the year ended December 31, 2020 under the Part the Cloud grant did not recur in the year ended December 31, 2021.

Other Income (Expense), Net

Other income (expense), net, changed from expense of $1.3 million for the year ended December 31, 2020 to income of $0.3 million for the year ended December 31, 2021. Other income for the year ended December 31, 2021 consisted of interest income on our available for sale securities. Other expense for the year ended December 31, 2020 consisted of losses on liability instruments recorded at fair value of $1.2 million, interest expense and accretion of discounts on convertible notes of $0.2 million, offset by a gain of $0.2 million on the extinguishment of convertible notes.

Liquidity and Capital Resources

Sources of Liquidity

Since our inception, we have funded our operations primarily with proceeds from the sale and issuance of common stock, convertible preferred stock, common stock warrants, and convertible notes, and to a lesser extent from grant income and stock option exercises. From our inception through December 31, 2021, we have raised aggregate net cash proceeds of $407.4 million primarily from the issuance of our common stock, convertible preferred stock, common stock warrants, and convertible notes.

Recent sales of our common stock were as follows:

	Common Shares Issued	Price Per Share	Net Proceeds (in millions)
September 2020 IPO	12,000,000	$ 17.00	$ 186.4
October 2020 overallotment exercise	1,397,712	17.00	22.1
January 2021 follow-on public offering	4,000,000	22.50	84.1
February 2021 overallotment exercise	600,000	22.50	12.7
Total	17,997,712		$ 305.3

As of December 31, 2021, we had $319.7 million in cash, cash equivalents and investments and have not generated positive cash flows from operations. Since our inception, we have devoted substantially all of our resources to our research and development efforts such as small molecule compound discovery, nonclinical studies and clinical trials, as well as manufacturing activities, establishing and maintaining our intellectual property portfolio, hiring personnel, raising capital, and providing general and administrative support for these operations.

Material Cash and Future Funding Requirements

Our material cash requirements include our operating leases for laboratory and office facilities. As of December 31, 2021, we had lease payment obligations of $2.7 million, with $0.5 million payable within 12 months. For additional information regarding our lease commitments, see Note 9 to our consolidated financial statements included elsewhere in this report. We are contingently committed to $0.9 million of potential future research and development milestone payments, in addition to sales-based payments and royalties, under our license agreement with WSU. Payments generally are due and payable only upon achievement of certain developmental, regulatory, and sales milestones for which the specific timing cannot

be predicted. Refer to Note 7 to our consolidated financial statements for additional information regarding the WSU license agreement. Additionally, we have purchase obligations and open purchase orders that support normal operations and are primarily due in the next 12 months. These purchase obligations and open purchase orders are generally cancellable in full or in part through the contractual provisions. We also anticipate that our research and development expenses and our general and administrative expenses will increase over at least the near-term as we advance our product candidates through clinical trials and increase our headcount to support our operations as we advance through clinical development and incur legal and other professional expenses related to our ongoing class action litigation and proxy contest. We cannot predict with certainty the amount and timing of these increased expenses.

Based upon our current operating plan, we estimate that our $319.7 million of cash, cash equivalents, and investments at December 31, 2021 will be sufficient to fund our operating expenses and capital expenditure requirements through at least the next 12 months following the date of this report. We will need to raise substantial additional capital to fund the development of our product candidates. Until such time as we can generate significant revenue from product sales, we expect to finance our operations through the sale of equity securities, debt financings, or other capital, which could include income from collaboration, licensing or similar arrangements with third parties, or receiving research contributions, or grants. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our stockholders will be or could be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our common stockholders. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise funds through collaborations, licenses and other similar arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us and/or may reduce the value of our common stock. Adequate funding may not be available when needed or on terms acceptable to us, or at all. Our ability to raise additional funds may be adversely impacted by potential worsening global economic conditions and the recent disruptions to, and volatility in, the credit and financial markets in the United States and worldwide resulting from the ongoing COVID-19 pandemic and otherwise. If we fail to obtain necessary capital when needed on acceptable terms, or at all, it could force us to delay, limit, reduce or terminate our product development programs, commercialization efforts or other operations. Insufficient liquidity may also require us to relinquish rights to product candidates at an earlier stage of development or on less favorable terms than we would otherwise choose. We cannot assure you that we will ever be profitable or generate positive cash flows from operating activities.

We have based our projections of operating capital requirements on assumptions that may prove to be incorrect and we may use all our available capital resources sooner than we expect. Because of the numerous risks and uncertainties associated with research, development and commercialization of biotechnology products, we are unable to estimate the exact amount of our operating capital requirements. Our future funding requirements will depend on many factors, including, but not limited to:

- the scope, timing, progress and results of our ongoing preclinical studies and clinical trials of our product candidates;
- the number of trials required for regulatory approval, in particular with respect to fosgonimeton for the treatment of mild-to-moderate AD;
- the scope, progress, results and costs of preclinical development, laboratory testing and clinical trials of other product candidates that we may pursue;
- our ability to establish and maintain collaboration, licensing or other similar arrangements, and the financial terms of any such arrangements, including the timing and amount of any future milestone, royalty or other payments due thereunder;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs and timing of future commercialization activities, including product manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;

- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval;
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims;
- the costs related to ongoing legal proceedings;
- any expenses needed to attract, hire and retain skilled personnel;
- the costs of operating as a public company;
- the costs associated with expanding our laboratory and office facilities; and
- the extent to which we acquire or in-license other companies' product candidates and technologies.

A change in the outcome of any of these or other factors 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 plan may change in the future, and we may need additional funds to meet operational needs and capital requirements associated with such operating plan.

Cash Flows

The following table summarizes our cash flows for the periods indicated:

	Year Ended December 31,	
	2021	2020
	(in thousands)	
Net cash provided by (used in):		
Operating activities	$ (43,098)	$ (24,113)
Investing activities	(4,079)	(210,068)
Financing activities	97,089	292,750
Net increase in cash and cash equivalents	$ 49,912	$ 58,569

Operating Activities

During the year ended December 31, 2021, net cash used in operating activities was $43.1 million. This consisted primarily of a net loss of $54.9 million, partially offset by non-cash charges of $5.6 million and a decrease in our net operating assets of $6.2 million. The non-cash charges primarily consisted of stock-based compensation expense, depreciation expense, and amortization of premiums and accretion of discounts on our available for sale securities. The decrease in our net operating assets was due to an increase in accounts payable and accrued expenses and a decrease in prepaid expenses and other current assets, partially offset by an increase in unbilled grant receivable.

During the year ended December 31, 2020, net cash used in operating activities was $24.1 million. This consisted primarily of a net loss of $19.9 million, partially offset by non-cash charges of $2.3 million and an increase in our net operating assets of $6.5 million. The non-cash charges primarily consisted of stock-based compensation expense, non-cash interest expense and accretion of discounts on our convertible notes, changes in the carrying value of liabilities stated at fair value, and the gain on extinguishment of our convertible notes. The increase in our net operating assets was due to an increase in unbilled grant receivable and prepaid expenses and other current assets and a decrease in grant liabilities, partially offset by an increase in accounts payable and accrued expenses.

Investing Activities

During the year ended December 31, 2021, net cash used in investing activities was $4.1 million. This consisted primarily of purchases of available-for-sale securities of $299.2 million and purchases of property

and equipment of $1.6 million, partially offset by maturities of available-for-sale securities of $278.6 million and sales of available-for-sale securities of $18.1 million.

During the year ended December 31, 2020, net cash used in investing activities was $210.1 million. This consisted primarily of purchases of available-for-sale securities of $226.8 million and purchases of property and equipment of $2.3 million, partially offset by maturities of available-for-sale securities of $19.1 million.

Financing Activities

During the year ended December 31, 2021, net cash provided by financing activities was $97.1 million, primarily driven by proceeds received from our follow-on public offering, and to a lesser extent from exercises of stock options.

During the year ended December 31, 2020, net cash provided by financing activities was $292.8 million. This consisted primarily of net proceeds received from our IPO of $208.5 million, net proceeds of $81.9 million from the issuance of our Series B convertible preferred stock and common stock warrants, $1.7 million from the issuance of our convertible notes, and to a lesser extent from exercises of stock options and common stock warrants.

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 and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenue and 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.

Derivative Liability, Convertible Notes Discount and Amortization

Our convertible notes had conversion and redemption features that met the definition of an embedded derivative and were therefore subject to derivative accounting. The initial fair value of the derivative was recorded as a discount to the convertible notes, with a corresponding derivative liability. The discount to the convertible notes was amortized using the effective interest method. The amortization of the discount was included in other income (expense), net in our statements of operations and comprehensive loss. The derivative liability related to these features was recorded at estimated fair value on a recurring basis. Any changes in fair value were reflected in other income (expense), net in our statements of operations and comprehensive loss at each period end while such instruments were outstanding. The derivative liability was remeasured to fair value until its settlement in May 2020 upon the conversion of the underlying convertible notes into shares of our Series B-1 convertible preferred stock.

Convertible Preferred Stock Warrant Liability

Freestanding warrants to purchase shares of our convertible preferred stock were accounted for as liabilities at fair value, because the shares underlying the warrants contained contingent redemption features outside our control. Warrants classified as liabilities are recorded on the balance sheets at their fair value on the date of issuance and remeasured to fair value on each subsequent reporting period, with the changes in fair value recognized as a component of other income (expense), net in the statements of operations. The liability is adjusted for changes in the fair value of these warrants until the earlier of the

exercise of the warrants, the expiration of the warrants, or until such time as the warrants are no longer considered liability instruments. The convertible preferred stock warrant liability was remeasured to fair value until its settlement in September 2020 upon the net exercise of warrants in connection with our IPO.

Grant Liability

The grant liability associated with the grants from the LSDF was accounted for under Accounting Standards Codification, or ASC, 825-10, *Financial Instruments—Overall*. The estimated fair value of the grant liability was reassessed at each balance sheet date, with changes in fair value reflected in other income (expense), net in our statements of operations and comprehensive loss at each period end. The fair value of the grant liability was estimated using a discounted cash flow simulation methodology that assigns probabilities to the timing and likelihood of each triggering event, each of which is disclosed in Note 7 to our consolidated financial statements included elsewhere in this report, as well as a discount rate based on market data for securities with similar durations and credit ratings to us, and the expected payment amount. The assumptions used to calculate the fair value of the grant liability were subject to significant judgment, and payment may be in an amount different from the liability that we estimate. The consummation of our IPO in September 2020 was a triggering event under the terms of the grant and the liability was remeasured to the pay-off amount of $1.5 million as of September 30, 2020 and repaid in full as of December 31, 2020.

Grant Income

In January 2019, the Alzheimer's Association awarded us a $1.0 million Part the Cloud research grant. Grant proceeds must be used to advance our fosgonimeton product candidate in the Alzheimer's disease setting. In December 2020, we accepted a grant from the National Institutes of Health ("NIH") to support our ACT-AD Phase 2 clinical trial for fosgonimeton. Under the terms of the agreement, we may receive approximately $7.8 million with the potential for an additional $7.4 million up to an aggregate of $15.2 million. We recognize income related to the Part the Cloud research grant and NIH grant within the consolidated statement of operations and comprehensive loss as qualifying expenses under the grant agreement are incurred. We record qualifying expenses incurred in excess of cash received in unbilled grant receivable on the consolidated balance sheets.

Research and Development Costs

Research and development costs, including costs associated with our clinical trials, are expensed as incurred. In-licensing fees and other costs to acquire technologies used in research and development that have not yet received regulatory approval and that are not expected to have an alternative future use are expensed when incurred. Non-refundable advance payments for goods and services that will be used over time for research and development are capitalized and recognized as goods are delivered or as the related services are performed. We estimate the period over which such services will be performed and the level of effort to be expended in each period. If actual timing of performance or the level of effort varies from the estimate, we will adjust the amounts recorded accordingly. We have not experienced any material differences between accrued or prepaid costs and actual costs since inception.

Stock-based Compensation

We maintain a stock-based compensation plan as a long-term incentive for employees, non-employee directors and consultants. The plan allows for the issuance of incentive stock options, non-qualified stock options, restricted stock units, and other forms of equity awards.

We recognize stock-based compensation expense for stock options on a straight-line basis over the requisite service period and account for forfeitures as they occur. Our stock-based compensation costs for stock options are based upon the grant date fair value of options estimated using the Black-Scholes option pricing model. To the extent any stock option grants are made subject to the achievement of a

performance-based milestone, management evaluates when the achievement of any such performance-based milestone is probable based on the relative satisfaction of the performance conditions as of the reporting date.

The Black-Scholes option pricing model utilizes inputs which are highly subjective assumptions and generally require significant judgment. These assumptions include:

- *Fair Value of Common Stock*. See the subsection titled "—Common Stock Valuations" below.
- *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 the option.
- *Expected Volatility*. Because we were privately held prior to September 2020 and do not yet have sufficient trading history for our common stock, the expected volatility was estimated based on the average volatility for comparable publicly traded life sciences companies over a period equal to the expected term of the stock option grants. The comparable companies were chosen based on the similar size, stage in life cycle or area of specialty. We will continue to apply this process until a sufficient amount of historical information regarding the volatility of our own stock price becomes available.
- *Expected Term*. The expected term represents the period that the stock-based awards are expected to be outstanding and is determined using the simplified method (based on the mid-point between the vesting date and the end of the contractual term), as we do not have sufficient historical data to use any other method to estimate expected term.
- *Expected Dividend Yield*. We have never paid dividends on our common stock and have no plans to pay dividends on our common stock. Therefore, we used an expected dividend yield of zero.

See Note 12 to our consolidated financial statements included elsewhere in this report for more 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. Certain of such assumptions involve inherent uncertainties and the application of significant judgment. As a result, if factors or expected outcomes change and we use significantly different assumptions or estimates, our stock-based compensation could be materially different.

We recognize stock-based compensation expense for restricted stock units on a straight-line basis over the requisite service period and account for forfeitures as they occur. We recognize compensation expense for restricted stock unit grants subject to performance-based milestone vesting using the accelerated attribution method over the remaining service period when we determine that achievement of the milestone is probable. We evaluate when the achievement of a performance-based milestone is probable based on the relative satisfaction of the performance conditions as of the reporting date. Our stock-based compensation costs for restricted stock units are based upon the fair market value of our common stock based on its closing price as reported on the date of grant on the Nasdaq Global Select Market.

We recorded stock-based compensation expense of $4.6 million and $0.6 million for the years ended December 31, 2021 and 2020, respectively. As of December 31, 2021, there was $10.2 million of total unrecognized stock-based compensation expense related to non-vested stock options which we expect to recognize over a remaining weighted-average period of 1.52 years. As of December 31, 2021, there was $4.8 million of total unrecognized stock-based compensation expense related to non-vested restricted stock units which we expect to recognize over a remaining weighted-average period of 1.33 years. We expect to continue to grant stock options and other equity-based awards in the future, and to the extent that we do, our stock-based compensation expense recognized in future periods will likely increase.

Common Stock Valuations

Historically, for all periods prior to our IPO, since there was no public market of our common stock, the fair value of the shares of common stock underlying our share-based awards was estimated on each grant date by our board of directors. To determine the fair value of our common stock underlying option grants, our board of directors considered, among other things, input from management, valuations of our common stock prepared by unrelated third-party valuation firms in accordance with the guidance provided by the American Institute of Certified Public Accountants 2013 Practice Aid, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*, and our board of directors' assessment of additional objective and subjective factors that it believed were relevant, and factors that may have changed from the date of the most recent valuation through the date of the grant. These factors include, but are not limited to:

- our results of operations and financial position, including our levels of available capital resources;
- our stage of development and material risks related to our business;
- progress of our research and development activities;
- our business conditions and projections;
- the valuation of publicly traded companies in the life sciences and biotechnology sectors, as well as recently completed mergers and acquisitions of peer companies;
- the lack of marketability of our common stock as a private company;
- the prices at which we sold shares of our convertible preferred stock to outside investors in arms-length transactions;
- the rights, preferences, and privileges of our convertible preferred stock relative to those of our common stock;
- the likelihood of achieving a liquidity event for our securityholders, such as an initial public offering or a sale of our company, given prevailing market conditions;
- the hiring of key personnel and the experience of management;
- trends and developments in our industry; and
- external market conditions affecting the life sciences and biotechnology industry sectors.

For our valuations performed prior to December 31, 2019, we used the option pricing method, or OPM, back-solve method. In an OPM framework, the back-solve method for inferring the equity value implied by a recent financing transaction involves making assumptions for the expected time to liquidity, volatility and risk-free rate and then solving for the value of equity such that value for the most recent financing equals the amount paid. This method was selected as management concluded that the contemporaneous financing transaction was an arms-length transaction.

For our valuations performed subsequent to December 31, 2019, we used a hybrid method of the OPM and the Probability-Weighted Expected Return Method, or PWERM. PWERM considers various potential liquidity outcomes. Our approach included the use of an initial public offering scenario and a scenario assuming continued operation as a private entity. Under the hybrid OPM and PWERM method, the per share value calculated under the OPM and PWERM are weighted based on expected exit outcomes and the quality of the information specific to each allocation methodology to arrive at a final estimated fair value per share of the common stock before a discount for lack of marketability is applied.

Since the completion of our IPO in September 2020, our board of directors determines the fair market value of our common stock based on its closing price as reported on the date of grant on the Nasdaq Global Select Market.

Income Taxes

We recognize deferred income taxes for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carry forwards. In evaluating our valuation allowance, we consider all available positive and negative evidence, including scheduled reversals of deferred tax liabilities, projected future taxable income, tax planning strategies, and recent financial performance. Due to our lack of earnings history and uncertainties surrounding our ability to generate future taxable income, the net deferred tax assets have been fully offset by a valuation allowance.

As of December 31, 2021, we had $9.5 million of federal net operating loss, or NOL, carryforwards and $2.9 million of tax credit carryforwards which expire over a period of 10 to 16 years. As of December 31, 2021, we had $80.7 million of such NOLs that do not expire.

Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, or the Code, substantial changes in our ownership may limit the amount of NOL and research and development credit carryforwards that could be used annually in the future to offset taxable income. The tax benefits related to future utilization of federal and state NOL carryforwards, credit carryforwards, and other deferred tax assets may be limited or lost if cumulative changes in ownership exceeds 50% within any three-year period. We have not completed a Section 382/383 analysis under the Code regarding the limitation of NOL and credit carryforwards. If a change in ownership were to have occurred, the annual limitation may result in the expiration of NOL carryforwards and credits before utilization.

We record unrecognized tax benefits as liabilities or reduce the underlying tax attribute, as applicable, and adjust them when our judgment changes as a result of the evaluation of new information not previously available. Because of the complexity of some of these uncertainties, the ultimate resolution may result in a payment that is materially different from our current estimate of the unrecognized tax benefit liabilities. These differences will be reflected as increases or decreases to income tax expense in the period in which new information is available.

Recent Accounting Pronouncements

See Note 2 to our consolidated financial statements included elsewhere in this report for additional information.

Emerging Growth Company Status

We are an emerging growth company, as defined in the 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. We 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 we (1) are no longer an emerging growth company or (2) affirmatively and irrevocably opt out of the extended transition period provided in the JOBS Act. As a result, our financial statements may not be comparable to companies that comply with the new or revised accounting pronouncements as of public company effective dates.

We will remain an emerging growth company until the earliest to occur of: (1) the last day of the fiscal year in which we have at least $1.07 billion in annual revenue; (2) the last day of the fiscal year in which we are deemed to be a “large accelerated filer,” as defined in Rule 12b-2 under the Securities Exchange Act of 1934, as amended, or the Exchange Act, which would occur if the market value of our common stock held by non-affiliates exceeded $700.0 million as of the last business day of the second fiscal quarter of such year; (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.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

As a smaller reporting company, we are not required to provide the information requested by this item pursuant to Item 305 of Regulation S-K.

Item 8. Financial Statements and Supplementary Data.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Athira Pharma, Inc.:

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Athira Pharma, Inc. (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations and comprehensive loss, convertible preferred stock and stockholders' equity, and cash flows for each of the two years in the period ended December 31, 2021, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's 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 financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2018.

Seattle, Washington
March 28, 2022

Athira Pharma, Inc.
Consolidated Balance Sheets
(in thousands, except share and per share amounts)

	December 31, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	$ 110,537	$ 60,625
Short-term investments	143,222	124,057
Unbilled grant receivable	2,336	1,300
Prepaid expenses and other current assets	4,704	6,355
Total current assets	260,799	192,337
Property and equipment, net	3,757	2,649
Operating lease right-of-use asset	1,460	936
Long-term investments	65,936	83,509
Other long-term assets	56	132
Total assets	$ 332,008	$ 279,563
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 567	$ 1,158
Accrued liabilities	8,437	3,123
Current operating lease liability	288	124
Total current liabilities	9,292	4,405
Operating lease liability, less current portion	1,632	876
Total liabilities	10,924	5,281
Stockholders' equity:		
Common stock, $0.0001 par value; 900,000,000 shares authorized at December 31, 2021 and December 31, 2020, respectively; 37,379,077 and 32,485,784 shares issued and outstanding at December 31, 2021 and December 31, 2020, respectively	4	3
Additional paid-in capital	417,363	315,288
Accumulated other comprehensive (loss) income	(388)	33
Accumulated deficit	(95,895)	(41,042)
Total stockholders' equity	321,084	274,282
Total liabilities and stockholders' equity	$ 332,008	$ 279,563

The accompanying notes are an integral part of these consolidated financial statements.

Athira Pharma, Inc.
Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except share and per share amounts)

	Year Ended December 31,	
	2021	2020
Operating expenses:		
Research and development	$ 42,794	$ 13,286
General and administrative	21,228	6,709
Total operating expenses	64,022	19,995
Loss from operations	(64,022)	(19,995)
Grant income	8,835	1,321
Other income (expense), net	334	(1,281)
Net loss	$ (54,853)	$ (19,955)
Unrealized (loss) gain on available-for-sale securities	(421)	33
Comprehensive loss attributable to common stockholders	$ (55,274)	$ (19,922)
Net loss per share attributable to common stockholders, basic and diluted	$ (1.49)	$ (1.67)
Weighted-average shares used in computing net loss per share attributable to common stockholders, basic and diluted	36,921,172	11,966,912

The accompanying notes are an integral part of these consolidated financial statements.

Athira Pharma, Inc.
Consolidated Statements of Convertible Preferred Stock and Stockholders' Equity
(in thousands, except share amounts)

	Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' (Deficit) Equity
	Shares	Amount	Shares	Amount				
Balance as of January 1, 2020	2,617,386	$ 17,051	3,641,449	$ —	$ 1,364	$ —	$ (21,087)	$ (19,723)
Issuance of common stock upon exercise of common stock options	—	—	540,934	—	544	—	—	544
Issuance of Series B convertible preferred stock and common stock warrants, net of issuance costs	9,372,765	70,971	—	—	10,591	—	—	10,591
Issuance of the Series B-1 convertible preferred stock upon conversion of convertible notes	512,858	4,515	—	—	—	—	—	—
Proceeds from initial public offering, net of underwriters' discounts and commissions and issuance costs	—	—	13,397,712	2	208,515	—	—	208,517
Conversion of convertible preferred stock	(12,503,009)	(92,537)	12,503,009	1	92,536	—	—	92,537
Exercise of common stock warrants	—	—	2,402,680	—	1,105	—	—	1,105
Stock-based compensation	—	—	—	—	633	—	—	633
Unrealized gain on available-for-sale securities	—	—	—	—	—	33	—	33
Net loss	—	—	—	—	—	—	(19,955)	(19,955)
Balance as of December 31, 2020	—	$ —	32,485,784	$ 3	$ 315,288	$ 33	$ (41,042)	$ 274,282
Issuance of common stock upon exercise of common stock options and vesting of restricted stock units	—	—	266,653	—	327	—	—	327
Issuance of common stock under employee stock purchase plan	—	—	26,640	—	364	—	—	364
Proceeds from follow-on public offering, net of underwriters' discounts and commissions and issuance costs	—	—	4,600,000	1	96,761	—	—	96,762
Stock-based compensation	—	—	—	—	4,623	—	—	4,623
Unrealized loss on available-for-sale securities	—	—	—	—	—	(421)	—	(421)
Net loss	—	—	—	—	—	—	(54,853)	(54,853)
Balance as of December 31, 2021	—	—	37,379,077	4	417,363	(388)	(95,895)	321,084

The accompanying notes are an integral part of these consolidated financial statements.

Athira Pharma, Inc.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,	
	2021	2020
Operating activities		
Net loss	$ (54,853)	$ (19,955)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation	4,623	633
Depreciation expense	479	2
Other non-cash expense	—	1,401
Amortization of premiums and accretion of discounts on available-for-sale securities, net	493	251
Changes in operating assets and liabilities:		
Unbilled grant receivable	(1,036)	(1,300)
Prepaid expenses and other current assets	1,650	(6,310)
Accounts payable and accrued liabilities	5,150	2,601
Operating lease liability	396	64
Grant Liability	—	(1,500)
Net cash used in operating activities	(43,098)	(24,113)
Investing activities		
Purchases of available-for-sale securities	(299,197)	(226,837)
Maturities of available-for-sale securities	278,639	19,053
Proceeds from sales of available-for-sale securities	18,052	—
Purchases of property and equipment	(1,573)	(2,320)
Principal payments received on stockholder note receivable	—	36
Net cash used in investing activities	(4,079)	(210,068)
Financing activities		
Proceeds from exercise of common stock options and common stock warrants	327	643
Proceeds from public offering, net of issuance costs	96,762	208,517
Proceeds from issuance of convertible preferred stock and common stock warrants, net of issuance costs	—	81,926
Proceeds from issuance of convertible notes, including derivative, net of issuance costs	—	1,664
Net cash provided by financing activities	97,089	292,750
Net increase in cash and cash equivalents	49,912	58,569
Cash and cash equivalents, beginning of period	60,625	2,056
Cash and cash equivalents, end of period	$ 110,537	$ 60,625
Supplemental disclosures of cash flow information:		
Purchases of property and equipment included in accounts payable and accrued liabilities	$ 14	$ 331
Deferred offering costs included in accounts payable and accrued liabilities	$ —	$ 77
Allocation of proceeds to common stock warrants issued in Series B convertible preferred stock financing	$ —	$ 10,591
Issuance of Series B-1 preferred stock upon conversion of promissory notes	$ —	$ 4,515
Recognition of warrant liability in connection with Series B convertible preferred stock financing	$ —	$ 364
Recognition of derivative liability upon issuance of convertible notes	$ —	$ 774
Conversion of convertible preferred stock upon closing of initial public offering	$ —	$ 92,537
Right-of-use asset obtained in exchange for new operating lease liability	$ 680	$ 975

The accompanying notes are an integral part of these consolidated financial statements.

1. Description of Business

Organization

Athira Pharma, Inc. (the "Company") was incorporated as M3 Biotechnology, Inc. in the state of Washington on March 31, 2011 and reincorporated in the state of Delaware on October 27, 2015. In April 2019, the Company changed its name to Athira Pharma, Inc. The Company currently has office and laboratory space in Bothell, Washington. The Company is a late clinical-stage biopharmaceutical company focused on developing small molecules to restore neuronal health and stop neurodegeneration.

Reverse Stock Split

On September 11, 2020, the Company effected a one-for-7.9302 reverse split of its issued and outstanding common stock, convertible preferred stock, warrants, and stock options. The par value of the common stock and convertible preferred stock was not adjusted as a result of the reverse stock split. All share and per share amounts in the accompanying consolidated financial statements and notes to the consolidated financial statements have been retroactively adjusted for all periods presented to reflect the reverse stock split.

Initial Public Offering

In September 2020, the Company completed its initial public offering of common stock ("IPO") in which the Company issued and sold 12,000,000 shares of common stock at a public offering price of $17.00 per share, resulting in net proceeds of $186.4 million after deducting underwriting discounts and commissions and offering expenses paid by the Company. In October 2020, the Company sold an additional 1,397,712 shares of common stock to the underwriters of the IPO upon partial exercise of the underwriters' option to purchase additional shares at the initial public offering price of $17.00 per share, less underwriting discounts and commissions and offering costs resulting in additional net proceeds to the Company of approximately $22.1 million.

In connection with the closing of the IPO, all of the Company's outstanding shares of convertible preferred stock were automatically converted into 12,503,009 shares of common stock. Immediately prior to the Company's IPO, all outstanding common stock warrants were exercised into 1,085,334 shares of common stock. Additionally, all outstanding Series B convertible preferred stock warrants were remeasured to their fair value. The final remeasurement of the Series B convertible preferred stock warrant liability resulted in a $0.6 million loss which was recorded to other income (expense), net. Following remeasurement, all Series B convertible preferred stock warrants automatically net exercised into 59,093 shares of common stock and the corresponding liability was reclassified to additional paid in capital. Following the IPO, there are no shares of convertible preferred stock, common stock warrants, or Series B convertible preferred stock warrants outstanding.

Follow-on Public Offering

In January 2021, the Company completed a follow-on public offering of its common stock. As part of the follow-on offering, the Company issued and sold 4,000,000 shares of its common stock at a public offering price of $22.50 per share. The Company received net proceeds of approximately $84.1 million from the follow-on offering, after deducting underwriting discounts and commissions and offering costs. In February 2021, the Company sold an additional 600,000 shares of common stock to the underwriters of the follow-on public offering upon full exercise of the underwriters' option to purchase additional shares at the follow-on public offering price of $22.50 per share, less underwriting discounts and commissions and offering costs resulting in additional net proceeds to the Company of approximately $12.7 million.

Liquidity and Capital Resources

Since the Company's inception, it has funded its operations primarily with proceeds from the sale and issuance of common stock, convertible preferred stock, common stock warrants, and convertible notes, and to a lesser extent from grant income and stock option exercises. From the Company's inception through December 31, 2021, it has raised aggregate net cash proceeds of $407.4 million primarily from the issuance of its common stock, convertible preferred stock, common stock warrants, and convertible notes. As of December 31, 2021, the Company had $319.7 million in cash, cash equivalents, and investments and had not generated positive cash flows from operations. Since the Company's inception, it has devoted substantially all of its resources to its research and development efforts such as small molecule compound discovery, nonclinical studies and clinical trials, as well as manufacturing activities, establishing and maintaining the Company's intellectual property portfolio, hiring personnel, raising capital, and providing general and administrative support for these operations.

Based upon the Company's current operating plan, it estimates that its $319.7 million of cash, cash equivalents, and investments at December 31, 2021 will be sufficient to fund its operating expenses and capital expenditure requirements through at least the next 12 months following the date of the Company's Annual Report on Form 10-K.

2. Significant Accounting Policies

Basis of Presentation

The consolidated financial statements have been prepared in conformity with U.S. generally accepted accounting principles ("U.S. GAAP"). During the third quarter of 2020, the Company incorporated Athira Pharma Australia PTY LTD in Australia and since its creation, the Australian subsidiary's financial position and results of operations are consolidated in the accompanying consolidated financial statements. Certain prior period amounts have been reclassified to conform to current period presentation.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of expenses during the reporting period. Estimates include those used for fair value of assets and liabilities, accrued liabilities, valuation allowance for deferred tax assets, and stock-based compensation. Management evaluates related assumptions on an ongoing basis using historical experience and other factors and adjusts those estimates and assumptions when facts and circumstances dictate. Actual results could differ from those estimates.

Cash and Cash Equivalents

The Company considers highly liquid investments with original maturities of three months or less to be cash equivalents.

Short-term and Long-term Investments

The Company generally invests its excess cash in investment grade short- to intermediate-term fixed income securities. Such investments are included in cash and cash equivalents, short-term investments, and long-term investments on the consolidated balance sheets, classified as available-for-sale, and reported at fair value with unrealized gains and losses included in accumulated other comprehensive income or loss. Realized gains and losses on the sale of these securities are recognized in net loss.

The Company periodically evaluates whether declines in fair values of its investments below their book value are other-than-temporary. This evaluation consists of several qualitative and quantitative factors regarding the severity and duration of the unrealized loss as well as the Company's ability and intent to

hold the investment until a forecasted recovery occurs. Additionally, the Company assesses whether it has plans to sell the security or it is more likely than not it will be required to sell any investment before recovery of its amortized cost basis. Factors considered include quoted market prices, recent financial results and operating trends, implied values from any recent transactions or offers of investee securities, credit quality of debt instrument issuers, other publicly available information that may affect the value of the investments, duration and severity of the decline in value, and our strategy and intentions for holding the investment.

Concentration of Credit Risk

The Company is exposed to credit risk from its deposits of cash in excess of amounts insured by the Federal Deposit Insurance Corporation. The Company has not experienced any losses on its deposits of cash since inception.

Property and Equipment

Property and equipment consist of computer equipment, computer software, laboratory equipment, leasehold improvements and furniture and office equipment. Property and equipment are recorded at cost and depreciation is recognized using the straight-line method based on estimated useful life, generally three to five years. Leasehold improvements are amortized over the shorter of their useful life or the remaining lease term. Maintenance and repairs are charged to expense as incurred, and costs of improvements are capitalized.

The Company reviews long-lived assets for impairment whenever events or circumstances indicate the carrying amount of an asset group may not be recoverable. Should an impairment exist, the impairment loss would be measured based on the excess of the asset's carrying amount over its fair value. Gains and losses from asset disposals and impairment losses are classified within the consolidated statements of operations and comprehensive loss in accordance with the use of the asset. There were no impairment losses in the years ended December 31, 2021 and 2020 as there have been no events warranting an impairment analysis.

Fair Value Measurements

The carrying amounts of certain financial instruments, including cash, cash equivalents, investments, accounts payable and accrued expenses approximate their fair values due to the short-term nature of those financial instruments. The fair values of the grant liability to Washington Life Sciences Discovery Fund (“LSDF”), currently managed by the Washington State Department of Commerce, the derivative liability, and the convertible preferred stock warrant liability were estimated using level 3 unobservable inputs.

Convertible Preferred Stock Warrant Liability

Freestanding warrants to purchase shares of the Company’s convertible preferred stock were accounted for as liabilities at fair value, because the shares underlying the warrants contained contingent redemption features outside the control of the Company. Warrants classified as liabilities are recorded on the Company’s balance sheets at their fair value on the date of issuance and remeasured to fair value on each subsequent reporting period, with the changes in fair value recognized as a component of other income (expense), net in the accompanying statements of operations and comprehensive loss. The Company adjusted the liability for the final change in the fair value of these warrants immediately preceding their automatic exercise in connection with the Company’s IPO. Subsequent to the Company’s IPO, the corresponding liability was reclassified to additional paid in capital.

Grant Liability

The grant liability associated with the grants from the Washington LSDF was accounted for under Accounting Standards Codification (“ASC”) 825-10, Financial Instruments − Overall. The estimated fair value of the grant liability was reassessed at each balance sheet date, with changes in fair value reflected

in other income (expense), net. The Company estimated the fair value of the grant liability by using a discounted cash flow simulation methodology that assigns probabilities to the timing and likelihood of each triggering event, a discount rate based on market data for securities with similar durations and credit ratings to the Company, and the expected payment amount. The assumptions used to calculate the fair value of the grant liability were subject to significant judgment. The consummation of the Company's IPO in September 2020 was a triggering event under the terms of the grant and the liability was remeasured to the pay-off amount of $1.5 million and repaid in full as of December 31, 2020. See Note 7.

Derivative Liability, Convertible Notes Discount and Amortization

The Company's convertible notes (see Note 8) had conversion and redemption features that met the definition of an embedded derivative and were therefore subject to derivative accounting. The initial fair value of the derivative was recorded as a discount to the convertible notes, with a corresponding derivative liability. The discount to the convertible notes was amortized using the effective interest method. The amortization of the discount is included in other income (expense), net in the statements of operations and comprehensive loss. The derivative liability related to these features was recorded at estimated fair value on a recurring basis. Any changes in fair value were reflected in other income (expense), net in the statements of operations and comprehensive loss at each period end while such instruments were outstanding. The derivative liability was settled in May 2020 upon conversion of the underlying convertible notes into Series B-1 convertible preferred stock. See Note 10.

Grant Income

Grant income in the accompanying consolidated statements of operations and comprehensive loss consisted of the following (in thousands):

	Year Ended December 31,	
	2021	2020
Alzheimer's Association Part the Cloud Research Grant	$ —	$ 245
National Institutes of Health Grant	8,835	1,076
Total grant income	$ 8,835	$ 1,321

Amounts recorded in the accompanying consolidated balance sheets as unbilled grant receivable from these granting agencies were as follows (in thousands):

	December 31,	
	2021	2020
Alzheimer's Association Part the Cloud Research Grant	$ —	$ 224
National Institutes of Health Grant	2,336	1,076
Total unbilled grant receivable	$ 2,336	$ 1,300

In January 2019, the Alzheimer's Association awarded the Company a $1.0 million Part the Cloud research grant. Grant proceeds must be used to advance the Company's fosgonimeton product candidate in the Alzheimer's disease setting. Reporting of expenses incurred supported by the grant as well as research updates are sent to the Alzheimer's Association semi-annually. Under the terms of the agreement, the Company received $776,000 in 2019 and received the remaining $224,000 in March 2021 after having completed certain development milestones in October 2020. The Company recognized income related to the Part the Cloud research grant as qualifying expenses under the grant agreement were incurred.

In December 2020, the Company accepted a grant from the National Institute on Aging ("NIA") of the National Institutes of Health ("NIH") to support its ACT-AD Phase 2 clinical trial for fosgonimeton, the Company's lead therapeutic candidate being developed for the treatment of individuals with mild-to-moderate Alzheimer's disease. Under the terms of the agreement, the Company may potentially receive

$7.8 million with the potential for an additional $7.4 million, up to an aggregate of $15.2 million. The Company recognizes income related to the NIH grant as qualifying expenses under the grant agreement are incurred. The Company received cash of $7.6 million related to the NIH grant during the year ended December 31, 2021.

Research and Development Expenses

Research and development expenses consist primarily of direct and indirect costs incurred for research activities, including development of the pipeline from the Company's proprietary drug discovery platform ("ATH platform"), the Company's drug discovery efforts and the development of its product candidates. Direct costs include laboratory materials and supplies, contracted research and manufacturing, clinical trial costs, consulting fees, and other expenses incurred to sustain the Company's research and development program. Indirect costs include personnel-related expenses, consisting of employee salaries, related benefits, and stock-based compensation expense for employees engaged in research and development activities, and facilities and other expenses consisting of direct and allocated expenses for rent and depreciation and lab consumables.

Research and development costs are expensed as incurred. In-licensing fees and other costs to acquire technologies used in research and development that have not yet received regulatory approval and that are not expected to have an alternative future use are expensed when incurred. Non-refundable advance payments for goods and services that will be used over time for research and development are capitalized and recognized as goods are delivered or as the related services are performed. The Company estimates the period over which such services will be performed and the level of effort to be expended in each period. If actual timing of performance or the level of effort varies from the estimate, the Company adjusts the amounts recorded accordingly. The Company has not experienced any material differences between accrued or prepaid costs and actual costs since inception.

General and Administrative Expenses

General and administrative expenses consist primarily of personnel-related costs, consisting of employee salaries, related benefits, and stock-based compensation expense for employees in the executive, legal, finance and accounting, human resources, and other administrative functions. General and administrative expenses also include third-party costs such as legal costs, insurance costs, accounting, auditing and tax related fees, consulting fees and facilities and other expenses not otherwise included as research and development expenses. General and administrative costs are expensed as incurred.

Leases

The Company adopted Accounting Standards Codification ("ASC") *Topic 842 - Leases* effective January 1, 2020. The Company determines if an arrangement contains a lease at inception. The Company performed an evaluation of contracts in accordance with ASC 842 and has determined it has an operating lease agreement for the laboratory and office facilities that the Company occupies. Operating lease right-of-use ("ROU") assets and operating lease liabilities are recognized at the date the underlying asset becomes available for the Company's use. Operating lease liabilities are based on the present value of the future minimum lease payments over the lease term. ROU assets are measured at the amount of the lease liability, adjusted for any initial direct costs incurred and any lease payments made at or before the lease commencement date, less lease incentives received. As the Company's leases generally do not provide an implicit interest rate, the present value of the future minimum lease payments is determined using the Company's incremental borrowing rate. This rate is an estimate of the collateralized borrowing rate the Company would incur on its future lease payments over a similar term and is based on the information available to the Company at the lease commencement date, discussed in more detail below.

The Company's leases contain options to extend the leases; lease terms are adjusted for these options only when it is reasonably certain the Company will exercise these options. The Company's lease agreements do not contain residual value guarantees or covenants.

The Company has made a policy election regarding its real estate leases not to separate non-lease components from lease components, to the extent they are fixed. Non-lease components that are not fixed are expensed as incurred as variable lease expense. The Company's lease includes variable non-lease components, such as common-area maintenance costs. The Company has elected not to record on the balance sheet a lease that has a lease term of 12 months or less and does not contain a purchase option that the Company is reasonably certain to exercise. The Company accounts for leases with initial terms of 12 months or less as operating expenses on a straight-line basis over the lease term.

Lease expense is recognized within operating expenses on a straight-line basis over the terms of the lease. Incentives granted under the Company's facilities lease, including rent holidays, are recognized as adjustments to lease expense on a straight-line basis over the term of the lease.

Stock-based Compensation

The Company measures compensation expense for all stock-based payments to employees, officers and directors based on the estimated fair value of the award at the grant date. For stock options, the Company estimates the grant date fair value of each option award using the Black-Scholes option-pricing model. The grant date fair value of restricted stock units is based upon the fair market value of the Company's common stock based on its closing price as reported on the date of grant on the Nasdaq Global Select Market. Compensation expense is recognized over the requisite service period on a straight-line basis. Forfeitures are recognized as they occur.

The Company records compensation expense for stock option and restricted stock unit grants subject to performance-based milestone vesting over the remaining implicit service period when management determines that achievement of the milestone is probable. Management evaluates when the achievement of a performance-based milestone is probable based on the relative satisfaction of the performance conditions as of the reporting date.

The Company adopted Accounting Standards Update ("ASU") 2018-07 as of January 1, 2020. As a result, stock-based payments issued to non-employees prior to January 1, 2020 have been recorded at their fair values as of the transition date and are no longer subject to periodic adjustments as the underlying equity instruments vest. Any remaining compensation expense is recognized over the remaining vesting term on a straight-line basis, which reflects the service period, based on the fair value as of January 1, 2020.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carry forwards. Deferred tax assets and liabilities 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. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

In assessing the Company's ability to realize deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences are deductible. Management considers the scheduled reversal of deferred tax liabilities, projected future income, tax planning strategies in making this assessment.

The Company recognizes the effect of income tax positions only if those positions are more likely than not of being sustained. Recognized income tax positions are measured at the largest amount that is greater than 50% likely of being realized. Changes in recognition or measurement are reflected in the period in

which the change in judgment occurs. The Company accrues interest and penalties related to unrecognized tax benefits in its provision for incomes taxes.

Comprehensive Loss Attributable to Common Stockholders

Comprehensive loss attributable to common stockholders consists of net loss and other gains and losses affecting stockholders' equity that, under U.S. GAAP, are excluded from net loss. The Company's comprehensive loss attributable to common stockholders is comprised of net loss and unrealized gains and losses on available-for-sale securities.

Net Loss Per Share Attributable to Common Stockholders

Basic net loss per share attributable to common stockholders is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding for the period, without consideration of potentially dilutive securities. Diluted net loss per share attributable to common stockholders is the same as basic net loss per share attributable to common stockholders since the effect of potentially dilutive securities is anti-dilutive given the net loss of the Company.

Foreign Currency Transaction Remeasurement Adjustments

Monetary assets and liabilities denominated in foreign currencies were translated into U.S. dollars, the reporting currency, at the exchange rate prevailing at the balance sheet date. Income and expenses denominated in foreign currencies were translated into U.S. dollars at the average exchange rate for the period and the transaction remeasurement adjustments are reported within other income (expense), net in the consolidated statement of operations and comprehensive loss. The functional currency of the Company's Australian subsidiary is the U.S. dollar.

Segments

The Company has determined that it operates and manages one operating segment, which is the business of developing and commercializing therapeutics. The Company's chief operating decision maker, its chief executive officer, reviews financial information on an aggregate basis for the purpose of allocating resources.

Emerging Growth Company Status

The Company is an emerging growth company, as defined in the Jumpstart Our Business Startups Act of 2012 ("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 is (a) no longer an emerging growth company or (b) affirmatively and irrevocably opts out of the extended transition period provided in the JOBS Act, unless early adoption is permitted. As a result, these financial statements may not be comparable to companies that comply with the new or revised accounting pronouncements as of public company effective dates.

Recent Accounting Pronouncements Not Yet Adopted

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments: Credit Losses (Topic 326)* as clarified in ASU 2019-04, ASU 2019-05, and ASU 2020-02. The objective of the standard is to provide information about expected credit losses on financial instruments at each reporting date and to change how other-than-temporary impairments on investment securities are recorded. The ASU will become effective beginning January 1, 2023, with early adoption permitted. The Company is currently evaluating the potential

impacts of the ASU on its financial condition, results of operations, cash flows and financial statement disclosures.

Although there were several other new accounting pronouncements issued or proposed by the FASB, the Company does not believe any of these have had or will have material impact on its consolidated financial statements.

3. Fair Value

The Company has certain assets and liabilities that are measured at fair value on a recurring basis according to a fair value hierarchy that prioritizes the inputs, assumptions and valuation techniques used to measure fair value. The three levels of the fair value hierarchy are:

Level 1—Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities.

Level 2—Quoted prices in markets that are not active or financial instruments for which all significant inputs are observable, either directly or indirectly.

Level 3—Inputs are generally unobservable and reflect management's estimates of assumptions that market participants would use in pricing the asset or liability. The fair values are determined using model-based techniques, including probability-based simulation methodologies.

The determination of a financial instrument's level within the fair value hierarchy is based on an assessment of the lowest level of any input that is significant to the fair value measurement. The Company considers observable data to be market data, which is readily available, regularly distributed or updated, reliable and verifiable, not proprietary, and provided by independent sources that are actively involved in the relevant market.

The following tables reflects the Company's financial asset balances measured on a recurring basis (in thousands):

		December 31, 2021			
	Level	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Cash equivalents:					
Money market fund	1	$ 57	$ —	$ —	$ 57
Commercial paper	2	96,120	—	(5)	96,115
Total cash equivalents		$ 96,177	$ —	$ (5)	$ 96,172
Short-term investments:					
Commercial paper	2	74,170	—	(35)	74,135
U.S. government debt, municipal bonds, and agency securities	2	62,149	2	(59)	62,092
Corporate bonds	2	7,004	—	(9)	6,995
Total short-term investments		$ 143,323	$ 2	$ (103)	$ 143,222
Long-term investments:					
Corporate bonds	2	3,307	—	(20)	3,287
U.S. government debt and agency securities	2	62,911	—	(262)	62,649
Total long-term investments		$ 66,218	$ —	$ (282)	$ 65,936

	December 31, 2020				
	Level	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Cash equivalents:					
Money market fund	1	$ 5	$ —	$ —	$ 5
Commercial paper	2	44,318	—	(2)	44,316
U.S. government debt and agency securities	2	4,999	—	—	4,999
U.S. treasury bills	2	4,450	—	—	4,450
Total cash equivalents		$ 53,772	$ —	$ (2)	$ 53,770
Short-term investments:					
Commercial paper	2	77,272	1	(4)	77,269
U.S. government debt and agency securities	2	31,835	7	—	31,842
U.S. treasury bills	2	14,029	—	(3)	14,026
Corporate bonds	2	920	—	—	920
Total short-term investments		$ 124,056	$ 8	$ (7)	$ 124,057
Long-term investments:					
U.S. government debt and agency securities	2	78,924	32	—	78,956
U.S. treasury bills	2	4,551	2	—	4,553
Total long-term investments		$ 83,475	$ 34	$ —	$ 83,509

All the commercial paper, U.S. government debt, municipal bonds and agency securities, U.S. treasury bills, and corporate bonds designated as short-term investments have an effective maturity date that is equal to or less than one year from the respective balance sheet date. Those that are designated as long-term investments have an effective maturity date that is more than one year, but less than two years, from the respective balance sheet date.

The Company evaluated its investments for other-than-temporary impairment and considers the decline in market value for the securities to be primarily attributable to current economic and market conditions. For the investments, it is not more-likely-than-not that the Company will be required to sell the investments, and the Company does not intend to do so prior to the recovery of the amortized cost basis.

Prior to the IPO, the Company's level 3 financial liabilities carried at fair value and remeasured on a recurring basis are the grant liability, derivative liability, and the convertible preferred stock warrant liability. In the third quarter of 2020 the Company recorded an additional $464,000 to bring the total grant liability to $1.5 million as the Company's IPO triggered the repayment obligation (see Note 7), and the derivative was settled upon the Company's conversion of its convertible notes in May 2020 (see Note 8). The losses resulting from the change in fair value of the grant liability, the bifurcated conversion and redemption features related to the derivative liability, and the convertible preferred stock warrant liability are classified as other income (expense), net in the accompanying consolidated statements of operations and comprehensive loss. Changes in any of the assumptions related to the unobservable inputs identified may change the fair value of these instruments. For example, an increase in interest rates would generally correspond to a decrease in the fair value of the liabilities.

The following table presents the activity for the grant liability (in thousands):

	Year Ended December 31, 2020
Fair value at beginning of period	$ 1,036
Change in fair value of grant liability	464
Grant liability settled upon completion of IPO	(1,500)
Fair value at end of period	$ —

The following table presents the activity for the derivative liability (in thousands):

	Year Ended December 31, 2020
Fair value at beginning of period	$ 999
Derivative liability recorded upon issuance of convertible notes	774
Change in fair value of derivative liability	132
Derivative liability settled upon conversion of convertible notes	(1,905)
Fair value at end of period	$ —

The following table presents the activity for the convertible preferred stock warrant liability (in thousands):

	Year Ended December 31, 2020
Fair value at beginning of period	$ —
Recognition of convertible preferred stock warrant liability	364
Change in fair value	641
Settlement upon IPO	(1,005)
Fair value at end of period	$ —

Prior to the IPO, the activity for the convertible preferred stock warrant liability presented in the table above was shown in the Company's financial statements as level 3. Following the IPO, the preferred stock warrant liability was revalued based on the IPO price of $17.00 per share.

4. Property and Equipment, Net

Property and equipment consisted of the following (in thousands):

	December 31,	
	2021	2020
Lab equipment	$ 268	$ 81
Office furniture, fixtures, and computer equipment	325	—
Leasehold improvement	2,563	—
Construction in progress	1,124	2,639
Property and equipment, at cost	4,280	2,720
Less: accumulated depreciation	(523)	(71)
Property and equipment, net	$ 3,757	$ 2,649

Depreciation expense was $479,000 and $2,000 for the years ended December 31, 2021 and 2020, respectively.

5. Accrued Liabilities

Accrued liabilities consisted of the following (in thousands):

	December 31,	
	2021	2020
Research and development expenses	$ 5,723	$ 1,169
Employee compensation and benefits	1,907	1,624
Professional services and other	807	330
Total accrued liabilities	$ 8,437	$ 3,123

6. Other Income (Expense), Net

Other income (expense), net consisted of the following (in thousands):

	Year Ended December 31,	
	2021	2020
Interest and other income	$ 337	$ 124
Interest expense	(3)	(367)
Change in fair value of derivative liability	—	(132)
Change in fair value of grant liability	—	(464)
Change in convertible preferred stock warrant liability	—	(641)
Gain on extinguishment of convertible notes	—	199
Total other income (expense), net	$ 334	$ (1,281)

7. Significant Agreements

Washington State University ("WSU") License Agreement

The Company is party to an amended and restated exclusive license agreement with sublicensing terms between the Company and Washington State University ("WSU") that the Company entered into in 2015. Under this agreement, the Company has an exclusive license to make, use, sell, and offer for sale products covered by certain licensed patents, including dihexa, the chemical compound into which fosgonimeton metabolizes following administration.

To keep in good standing, the agreement requires the Company to meet certain development milestones and pay annual maintenance fees. All contractual requirements have been met as of December 31, 2021.

During the year ended December 31, 2020, the Phase 2 clinical trial milestone had been reached and a payment of $50,000 to WSU was recorded.

The Company may also be obligated to pay the following if the related milestones are reached:

- $300,000 – At initiation of the first Phase 3 clinical trial in the United States, European Union or Japan for the first licensed product; and
- $600,000 – Upon receipt of marketing approval in the United States, European Union or Japan for the first licensed product.

Under the terms of the agreement, the Company will pay a royalty in the mid-single digits of net sales, with the first $100,000 of net sales being exempt from royalty payment, and annual minimum royalty payments of $25,000 beginning after the first commercial sale of a licensed product. As of December 31, 2021, no sales of any licensed products had occurred and the Company had not incurred a royalty obligation under this agreement.

Additionally, the agreement allows the Company to sublicense the rights conveyed by the agreement, subject to additional payments to WSU based upon the sublicense consideration received in such event. Such amounts are dependent on the terms of the underlying sublicense and range from the mid-single digits to mid-teens of any non-sales based payments received, and low twenties of net sales based sublicense royalties. As of December 31, 2021, the Company has not entered into or incurred any liability from a sublicense agreement.

LSDF Grant Liability

In 2014 and 2015, the Company received $250,000 and $500,000, respectively, from LSDF under the terms of two matching grant award agreements. In connection with the agreements, LSDF retained the right to receive cash payments of 2.0 times the amounts received, or $1.5 million, upon the occurrence of specified triggering events, including:

- receipt of license revenue, sales revenue, or consideration related to the underlying IP;
- transfers the underlying IP without receiving consideration;
- relocation of the Company from Washington state;
- completion of an initial public offering;
- a third-party acquisition of a controlling interest in the Company, and;
- termination of the agreements.

To appropriately capture the economics of this arrangement, the grant liability was accounted for under ASC 825-10, Financial Instruments − Overall. The estimated fair value of the grant liability was reassessed at each balance sheet date, with changes in fair value reflected in other income (expense), net. To determine the estimated fair value of the grant liability, the Company used a discounted cash flow simulation methodology that assigns probabilities to the timing and likelihood of each triggering event, a discount rate based on market data for securities with similar durations and credit ratings to the Company, and the expected payment amount. The assumptions used to calculate the fair value of the grant liability were subject to significant judgment, and payment may have been in an amount different from the liability that the Company estimated. However, total payments under the agreements would not exceed $1.5 million.

The consummation of the Company's IPO in September 2020 was a triggering event under the terms of the grant and the liability was remeasured to the pay-off amount of $1.5 million prior to settlement. The change in the fair value of the liability resulted in expense of approximately $464,000 for the year ended December 31, 2020, which was included in other income (expense), net in the accompanying consolidated statements of operations and comprehensive loss.

8. Convertible Notes

The Company issued unsecured convertible notes with an aggregate principal amount of $1.7 million in 2020. Previously, the Company issued unsecured convertible notes with aggregate principal amounts of $0.9 million and $1.3 million in 2019 and 2018, respectively. The notes accrued interest at a rate of 5% per year and mature in December 2021, unless earlier converted. No principal or interest was payable prior to maturity as the convertible notes and any accrued interest would automatically convert upon a qualified financing event at a conversion price equal to 85% of the price per share of the qualified financing. Holders may have also elected to convert their notes to shares of common stock upon the maturity of the notes at the then fair value of common stock. If the Company experienced a change in control, holders may have either converted the outstanding principal amount plus any accrued interest into shares of common stock at the then fair value of common stock or may have required the Company to repurchase the notes in cash at a price equal to 200% of the outstanding principal amount plus any accrued interest.

Certain conversion and redemption features as described above were determined to be an embedded derivative requiring bifurcation and separate accounting in accordance with ASC 815, *Derivatives and Hedging*. The fair value of the embedded derivative was determined using a discounted cash flow simulation methodology that assigns probabilities to the timing and likelihood of each event. The discount rate was determined based on market interest rate data for securities with similar durations and credit ratings to the convertible notes. The fair value of the embedded derivative was recorded as a liability with an offsetting amount recorded as a discount on the convertible notes at each issuance. The discount is being amortized to interest expense using the effective interest method over the contractual term of the notes.

In May 2020, the outstanding principal balance of the convertible notes of $3.8 million and accrued interest of $160,000 converted into 512,858 shares of Series B-1 convertible preferred stock.

The excess of the carrying value of the convertible notes and the derivative liability over the fair value of the Series B-1 convertible preferred stock at conversion resulted in a gain upon extinguishment of $199,000.

9. Commitments and Contingencies

Legal Proceedings

From time to time, we are subject to various legal proceedings or claims that arise in the ordinary course of business. We accrue a liability when management believes that it is both probable that a liability has been incurred and the amount of loss can be reasonably estimated, and as of December 31, 2021, we have not recorded any such liabilities. The following is a brief description of the more significant legal proceedings.

Securities Class Actions

On June 25, 2021, plaintiffs Fan Wang and Hang Gao filed a putative securities class action lawsuit in the U.S. District Court for the Western District of Washington against the Company and the Company's former Chief Executive Officer Dr. Leen Kawas, captioned *Wang v. Athira Pharma, Inc., et al.*, No. 2:21-cv-00861. Plaintiffs Wang and Gao assert claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 and SEC Rule 10b-5, alleging that the defendants made materially false and misleading statements and omitted material adverse facts regarding the Company's business. Specifically, the *Wang* plaintiffs allege that the Company failed to disclose to investors that certain research conducted by Dr. Kawas was allegedly tainted by scientific misconduct during her doctoral work at WSU, including the manipulation of data, and that as a result, the defendants' positive statements about the Company's business, operations, and prospects were materially misleading. The *Wang* plaintiffs seek unspecified compensatory and punitive damages, and reasonable costs and expenses, including attorneys' fees.

That same day, on June 25, 2021, plaintiff Harshdeep Jawandha filed a putative securities class action lawsuit in the U.S. District Court for the Western District of Washington against the Company, Dr. Kawas, the Company's Chief Financial Officer, certain members of the Company's board of directors at the time of the Company's IPO, as well as the IPO underwriters, captioned *Jawandha v. Athira Pharma, Inc., et al.*, No. 2:21-cv-00862. The *Jawandha* complaint asserts violations of Sections 11 and 15 of the Securities Act of 1933, alleging that that the Company's IPO registration statement was materially false and misleading because it omitted to state that certain of Dr. Kawas's published doctoral research papers at WSU contained allegedly improperly altered images, that the research was allegedly foundational to the Company's efforts to develop treatments for Alzheimer's disease, and that the defendants' positive statements about the Company's business, operations, and prospects were materially misleading. The plaintiff seeks unspecified compensatory damages, and reasonable costs and expenses, including attorneys' fees.

Also on June 25, 2021, plaintiffs Timothy Slyne and Tai Slyne filed a putative securities class action lawsuit in the U.S. District Court for the Western District of Washington against the Company, Dr. Kawas,

the Company's Chief Financial Officer, and the same members of the Company's board of directors and underwriters as in the *Jawandha* complaint, captioned *Slyne v. Athira Pharma, Inc. et al.*, No. 2:21-cv-00864. The *Slyne* complaint asserts violations of Sections 11 and 15 of the Securities Act of 1933, alleging that purported issues with Dr. Kawas's doctoral research at WSU should have been disclosed in the Company's IPO registration statement. The *Slyne* plaintiffs seek unspecified compensatory damages, reasonable costs and expenses, including attorneys' fees, and injunctive and other equitable relief.

On August 9, 2021, the district judge presiding over *Wang v. Athira Pharma, Inc., et al.*, No. 2:21-cv-00861, issued an order consolidating the three cases under that case number. On October 5, 2021, the district court issued an order appointing lead plaintiffs and approved their selection of lead and liaison counsel.

On January 7, 2022, lead plaintiffs filed a consolidated amended complaint, which asserts violations of Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 and SEC Rule 10b-5 and Sections 11, 12, and 15 of the Securities Act of 1933. The consolidated amended complaint is brought against the Company, Dr. Kawas, the Company's chief financial officer, certain members of our board of directors at the time of our IPO and secondary public offering (SPO), and the IPO and SPO underwriters. As with the previous complaints, it is based on allegations that the IPO and SPO registration statements and/or other public statements were materially false and misleading because they omitted to state that certain of Dr. Kawas's published doctoral research papers at WSU contained allegedly improperly altered images. Lead plaintiffs seek unspecified compensatory damages, equitable and injunctive relief, and reasonable costs and expenses, including attorneys' fees, on behalf of themselves and the purported class. On March 8, 2022, the defendants filed a motion to dismiss lead plaintiffs' consolidated amended complaint for failure to state a claim under the federal securities laws.

The Company cannot predict the outcome of these suits, and failure by the Company to obtain a favorable resolution of these suits could have a material adverse effect on its business, results of operations and financial condition. The Company's chances of success on the merits are still uncertain and any possible loss or range of loss cannot be reasonably estimated and as such the Company has not recorded a liability as of December 31, 2021.

Indemnifications

In the ordinary course of business, the Company enters into agreements that may include indemnification provisions. Pursuant to such agreements, the Company may indemnify, hold harmless and defend an indemnified party for losses suffered or incurred by the indemnified party. Some of the provisions will limit losses to those arising from third party actions. In some cases, the indemnification will continue after the termination of the agreement. The maximum potential amount of future payments the Company could be required to make under these provisions is not determinable. The Company has never incurred material costs to defend lawsuits or settle claims related to these indemnification provisions. The Company enters into indemnification agreements with its directors and officers that may require the Company to indemnify its directors and officers against liabilities that may arise by reason of their status or service as directors or officers to the fullest extent permitted by Delaware corporate law. The Company currently has directors' and officers' insurance coverage that reduces its exposure and enables the Company to recover a portion of any future amounts paid.

Operating Leases

The Company has operating leases for laboratory and office facilities in Bothell, Washington that expire in August 2027. The initial terms of the leases range from 6.3 to 7 years and the Company has options to extend the leases for an additional five years that it is not reasonably certain to exercise. As of December 31, 2021, the Company was not party to any finance leases.

The following table reconciles the Company's undiscounted operating lease cash flows to its operating lease liability (in thousands):

	December 31, 2021
2022	452
2023	466
2024	480
2025	494
Thereafter	856
Total undiscounted lease payments	2,748
Present value adjustment for minimum lease commitments	(548)
Tenant improvement allowance receivable	(280)
Net lease liability	$ 1,920

The weighted average remaining lease term and the weighted average discount rate used to determine the operating lease liability were as follows:

	December 31, 2021
Weighted average remaining lease term (years)	5.9
Weighted average discount rate	8.1%

Operating lease expense was $323,000 for the year ended December 31, 2021. Separately, variable lease expense was $108,000 for operating leases during the year ended December 31, 2021.

10. Convertible Preferred Stock

In May and June 2020, the Company issued an aggregate of 9,372,765 shares of its Series B convertible preferred stock at a purchase price of $9.12 per share for aggregate proceeds of $81.6 million, net of offering costs. The Company issued warrants to purchase 2,343,168 shares of its common stock, of which 688,067 were exercised concurrently with the shares of Series B convertible preferred stock issuance, for net proceeds of $55,000. In addition, the Company issued warrants to purchase 127,481 shares of its Series B convertible preferred stock at a purchase price of $9.12 per share. The Series B convertible preferred stock financing triggered the automatic conversion of the Company's outstanding convertible promissory notes into 512,858 shares of Series B-1 convertible preferred stock based on a price of $7.752 per share (85% of the $9.12 original issuance price of the Series B convertible preferred stock).

In September 2020, upon the consummation of the Company's IPO, all outstanding shares of convertible preferred stock converted into 12,503,009 shares of common stock.

11. Common Stock

Each share of common stock has the right to one vote. The holders of common stock are also entitled to receive dividends whenever funds are legally available and if declared by the Company's board of directors, subject to the prior rights of holders of all classes of stock outstanding having priority rights as to dividends. No cash dividends have been declared by the board of directors from inception.

The Company has reserved the following shares of common stock for future issuance, on an as-converted basis, as follows:

	December 31,	
	2021	2020
Shares issuable upon the exercise of outstanding common stock options and the vesting of outstanding common restricted stock units granted	2,632,396	1,974,870
Shares available for future grant under the 2020 Equity Incentive Plan	4,442,315	3,742,235
Shares available for future grant under the Employee Stock Purchase Plan	621,211	323,000
Total	7,695,922	6,040,105

The Company's 2020 Equity Incentive Plan ("2020 Plan") provides for annual increases in the number of shares that may be issued under the 2020 Plan on January 1, 2021 and each subsequent January 1, thereafter, by a number of shares equal to the least of (a) 3,230,000 shares, (b) 5% of the number of shares of common stock issued and outstanding on the immediately preceding December 31, or (c) an amount determined by the Company's board of directors.

The Company's 2020 Employee Stock Purchase Plan ("ESPP") provides for annual increases in the number of shares that may be issued under the ESPP on January 1, 2021 and each subsequent January 1, thereafter, by a number of shares equal to the least of (a) 646,000 shares, (b) 1% of the number of shares of common stock issued and outstanding on the immediately preceding December 31, or (c) an amount determined by the Company's board of directors.

Effective January 1, 2021, the Company's 2020 Plan and ESPP reserves increased by 1,624,259 shares and 324,851 shares, respectively.

Effective January 1, 2022, the Company's 2020 Plan and ESPP reserves increased by 1,868,953 shares and 373,790 shares, respectively.

12. Stock-based Compensation

Stock-based compensation expense recognized was as follows (in thousands):

	Year Ended December 31,	
	2021	2020
Research and development	$ 1,368	$ 215
General and administrative	3,255	418
Total stock-based compensation expense	$ 4,623	$ 633

Valuation Assumptions

The fair value of stock options was determined using the Black-Scholes option-pricing model and the assumptions below. Each of these inputs is subjective and generally required significant judgment.

- *Fair Value of Common Stock*—Prior to the closing of the Company's initial public offering, the grant date fair market value of the shares of common stock underlying stock options has historically been determined by the Company's board of directors. Because previously there was no public market for the Company's common stock, the board of directors exercised reasonable judgment and considered a number of objective and subjective factors to determine

the best estimate of the fair market value, which include contemporaneous valuations performed by an independent third party, important developments in the Company's operations, sales of convertible preferred stock, the rights, preferences and privileges of its convertible preferred stock relative to those of its common stock, lack of marketability of its common stock, actual operating results, financial performance, the progress of clinical development, the likelihood of achieving a liquidity event for its security holders, the trends, development and conditions in the life sciences and biotechnology sectors, the economy in general, and the stock price performance and volatility of comparable public companies. For valuations of grants made after the closing of the Company's initial public offering, the fair value of each share of common stock is based on the closing price of the Company's common stock on the date of grant, or other relevant determination date, as reported on The Nasdaq Global Select Market.

- *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 the option.
- *Expected Volatility*—Because the Company was previously privately held and did not have any trading history for its common stock, the expected volatility was estimated based on the average volatility for comparable publicly traded life sciences companies over a period equal to the expected term of the stock option grants. The comparable companies were chosen based on the similar size, stage in 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 Term*—The expected term represents the period that the stock-based awards are expected to be outstanding and is determined using the simplified method (based on the midpoint between the vesting date and the end of the contractual term) as the Company has limited history of relevant stock option exercise activity.
- *Expected Dividend Yield*—The Company has never paid dividends on its common stock and has no plans to pay dividends going forward. Therefore, it used an expected dividend yield of zero.

The fair value of each stock option was estimated using the Black-Scholes option-pricing model with the following weighted-average assumptions:

	Year Ended December 31,	
	2021	2020
Risk-free interest rate	0.99%	0.49%
Expected volatility	90.91%	87.41%
Expected term (in years)	6.10	6.87
Expected dividend yield	—	—

The grant date fair value of restricted stock units is based upon the fair market value of the Company's common stock based on its closing price as reported on the date of grant on the Nasdaq Global Select Market.

The weighted-average grant-date fair value of options granted during the years ended December 31, 2021 and 2020 were $14.4 million and $4.2 million respectively. The weighted-average grant-date fair value of restricted stock units granted during the year ended December 31, 2021 was $5.7 million. No restricted stock units were granted during the year ended December 31, 2020.

Stock Option Activity

Changes in shares available for grant under the 2020 Plan during the year ended December 31, 2021 were as follows:

	Shares Available for Grant
Shares available for grant at December 31, 2020	3,742,235
2020 Plan reserve increase on January 1, 2021	1,624,259
Options and restricted stock units granted	(1,392,928)
Options and restricted stock units forfeited, cancelled, or expired	468,749
Shares available for grant at December 31, 2021	4,442,315

A summary of option activity for the year ended December 31, 2021 was as follows:

	Shares	Weighted-Average Exercise price per Share	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Balance at December 31, 2020	1,974,870	$ 9.31	7.98	$ 49,275
Granted	1,024,776	18.83		
Exercised	(263,501)	1.24		
Forfeited/expired	(465,249)	18.02		
Balance at December 31, 2021	2,270,896	$ 12.76	7.22	$ 8,306
Expected to vest	1,457,586	$ 16.08	8.98	$ 1,925
Options exercisable	813,310	$ 6.80	4.05	$ 6,380

The total fair value of options granted that vested during the years ended December 31, 2021 and 2020 was $1.4 million and $271,000, respectively.

The aggregate intrinsic value in the table above is calculated as the difference between the exercise price of the underlying options and the estimated fair value of the Company's common stock underlying all options that were in-the-money at December 31, 2021. The aggregate intrinsic value of options exercised was $3.1 million and $18.0 million during the year ended December 31, 2021 and 2020, respectively, determined as of the date of option exercise. As of December 31, 2021, there was $10.2 million of total unrecognized compensation cost related to non-vested stock options. The Company expects to recognize this cost over a remaining weighted-average period of 1.52 years. The Company utilizes newly issued shares to satisfy option exercises.

Stock options outstanding and exercisable consisted of the following at December 31, 2021:

	Employees and Directors		Non-employees	
Exercise Price ($)	Shares Outstanding	Shares Exercisable	Shares Outstanding	Shares Exercisable
0.16 to 1.00	209,780	209,780	—	—
1.04 to 1.49	364,524	222,659	113,642	93,150
17.00 to 19.94	989,576	210,071	195,453	60,684
20.55 to 29.41	397,921	16,966	—	—
Total	1,961,801	659,476	309,095	153,834

Restricted Stock Award Activity

In 2018, the Company issued a restricted stock award ("RSA") to an advisor under the 2014 Plan. The restricted stock award vests over three years and requires continued service to the Company during the vesting period. The vesting provisions of individual awards may vary as approved by the board of directors. If continued service terminates for any reason, the Company has the right to repurchase the non-vested shares for no consideration. There were 4,204 shares subject to repurchase as of December 31, 2020, all of which were related to non-employee RSAs.

A summary of RSA activity for the year ended December 31, 2021 was as follows:

	Share Equivalent	Weighted-Average Grant Date Fair Value
Non-vested at December 31, 2020	4,204	$ 1.35
Granted	—	—
Vested	(4,204)	1.35
Non-vested at December 31, 2021	—	$ —

Restricted Stock Unit Activity

During the year ended December 31, 2021, the Company issued restricted stock unit ("RSU") awards to an advisor and employees under the 2020 Plan.

A summary of RSU activity for the year ended December 31, 2021 is as follows:

	Share Equivalent	Weighted-Average Grant Date Fair Value
Non-vested at December 31, 2020	—	$ —
Granted	368,152	15.37
Cancelled	(3,500)	15.34
Vested	(3,152)	21.15
Non-vested at December, 2021	361,500	$ 15.32

In November 2021, the Company granted RSUs equivalent to 365,000 shares of the Company's common stock to employees under the 2020 Plan with a grant date fair value of $5.6 million. The RSUs will vest upon achievement of certain clinical development milestones, subject to continued service to the Company during the vesting period.

As of December 31, 2021, unrecognized stock-based compensation expense related to non-vested restricted stock units was $4.8 million, which is expected to be recognized over a remaining weighted-average period of 1.33 years

Employee Stock Purchase Plan

In August 2020, the Company's board of directors adopted the 2020 Employee Stock Purchase Plan ("ESPP") which became effective in September 2020. Under the ESPP, eligible employees can authorize payroll deductions for amounts up to the lesser of 15% of their qualifying wages or the statutory limit under the U.S. Internal Revenue Code. The ESPP provides for offering periods of six months in duration with one purchase period per offering period beginning May 18 and November 18 of each year. Participants in an offering period will be granted the right to purchase common shares at a price per share that is 85% of the lesser of the fair market value of the shares at (i) the first day of the offering period or (ii) the end of each

purchase period within the offering period. A maximum of 5,000 shares of common stock may be purchased by each participant at the purchase date during the offering period. The fair value of the ESPP options granted is determined using the Black-Scholes model and is amortized on a straight-line basis. The number of shares reserved for the ESPP automatically increases each year, beginning on January 1, 2021 by the lesser of (i) 646,000 shares of common stock, (ii) 1% of the outstanding shares of common stock on the last day of the immediately preceding fiscal year, or (iii) such number of shares determined by the board no later than the last day of the immediately preceding fiscal year. As of December 31, 2021, 621,211 shares of common stock were reserved for future grants under the ESPP. On January 1, 2022, an additional 373,790 shares of common stock became available for future grants under the ESPP. Stock-based compensation expense recognized during the years ended December 31, 2021 and 2020 associated with the ESPP was $164,000 and $46,000, respectively.

During the year ended December 31, 2021, the Company issued 26,640 shares of common stock to service providers under the ESPP.

13. Income Taxes

Components of Income and Income Tax

The Company did not record a provision (benefit) for income taxes for the years ended December 31, 2021 and 2020. Net loss is attributable to the following tax jurisdictions (in thousands):

	Year Ended December 31,	
	2021	2020
United States	$ (54,963)	$ (19,969)
Foreign	110	14
Net Loss	$ (54,853)	$ (19,955)

The provision for income taxes differs from the amount expected by applying the federal statutory rates to the net loss before taxes as follows:

	Year Ended December 31,	
	2021	2020
Federal statutory income tax rate	21.0%	21.0%
State Taxes	1.2	—
Non-deductible expenses and others	0.2	0.2
Non-deductible expense related to the convertible notes and derivative liability	—	(1.0)
Non-deductible expense related to the grant liability	—	(0.1)
Tax credits	2.2	1.5
Change in valuation allowance	(24.6)	(21.6)
Effective income tax rate	—%	—%

Deferred Tax Assets and Liabilities

The components of the Company's deferred tax assets and liabilities were as follows (in thousands):

	Year Ended December 31,	
	2021	2020
Deferred tax assets:		
Net operating loss carryforwards	$ 19,543	$ 8,090
Research and development tax credit carryforwards	2,166	1,011
Accrued liabilities	392	295
Stock-based compensation	804	106
Operating lease liability	426	210
Other	224	72
Total deferred tax assets	23,555	9,784
Deferred tax liabilities:		
Right of use asset	(324)	(197)
Prepaid expenses and other	(664)	(489)
Total deferred tax liabilities	(988)	(686)
Less valuation allowance	(22,567)	(9,098)
Net deferred tax assets	$ —	$ —

Deferred income taxes reflect temporary differences between the carrying amounts of assets and liabilities for financial reporting and income tax purposes, and operating losses and tax credit carryforwards. The Company considers a number of factors concerning the realizability of its net deferred tax assets, including its history of operating losses, the nature of the deferred tax assets, and the timing, likelihood and amount, if any, of future taxable income during the periods in which those temporary differences and carryforwards become deductible, all of which require significant judgment. As of December 31, 2021, the Company has recorded a full valuation allowance on its net deferred tax assets as the Company has concluded that it is not more likely than not that such losses or credits will be utilized. The valuation allowance increased by $13.5 million and $4.3 million during 2021 and 2020, respectively.

At December 31, 2021, the Company has federal net operating loss and tax credit carryforwards of $9.5 million and $2.9 million, respectively, which expire over a period of 10 to 16 years. Net operating loss carryforwards of $80.7 million were generated after 2017, and therefore do not expire.

Uncertain Tax Positions

The Company files federal income tax returns. With few exceptions, the Company is no longer subject to income tax examinations by tax authorities for years prior to 2016. However, to the extent allowed by law, the tax authorities may have the right to examine prior periods where net operating losses or tax credits were generated and carried forward and may make adjustments to the amount of the net operating loss or credit carryforward amount. The Company is not currently under examination in any jurisdiction.

A reconciliation of the beginning and ending amount of unrecognized tax benefits for uncertain tax positions were as follows (in thousands):

	Year Ended December 31,	
	2021	2020
Beginning balance	$ 337	$ 239
Additions for tax positions taken in the current year	385	98
Ending balance	$ 722	$ 337

If the unrecognized tax benefits for uncertain tax positions as of December 31, 2021 are recognized, there will be no impact to the effective tax rate due to the valuation allowance. The Company recognizes interest and penalties related to unrecognized tax benefits within the income tax expense line in the accompanying consolidated financial statements. At December 31, 2021, there were no material interest and penalties on uncertain tax benefits. The Company does not anticipate any significant changes to its unrecognized tax benefits in the next 12 months.

14. Employee Benefit Plans

The Company has a 401(k) Plan for all of its employees. The 401(k) Plan allows eligible employees to defer, at the employee's discretion, up to 100% of their pretax compensation up to the Internal Revenue Service annual limit. The Company did not make any matching contributions for the years ended December 31, 2021 or 2020.

15. Net Loss Per Share Attributable to Common Stockholders

The following outstanding shares of potentially dilutive securities were excluded from the computation of the diluted net loss per share attributable to common stockholders for the periods presented because their effect would have been anti-dilutive:

	Year Ended December 31,	
	2021	2020
Non-vested RSAs	—	4,204
Non-vested RSUs	361,500	—
Stock options to purchase common stock	2,270,896	1,974,870
Employee stock purchase plan	1,277	3,995
Total	2,633,673	1,983,069

16. Immaterial Error Correction (Unaudited)

In connection with the preparation of the consolidated statements of operations and comprehensive loss for the year ended December 31, 2021, the Company identified immaterial errors in the calculation of the weighted-average number of common shares outstanding, basic and diluted, for certain of its year-to-date periods presented in its interim financial statements, resulting in an understatement in the weighted average common shares outstanding and an overstatement in the net loss per share, basic and diluted. This error was revised as shown in the table below. The error did not impact the weighted average common shares outstanding, basic and diluted, for any three-month period and had no impact on net loss, comprehensive loss, total assets, or stockholders' equity. The impact of the error was as follows:

	Six Months Ended June 30, 2021 (unaudited)		
	As Reported	Adjustment	As Adjusted
Weighted average shares outstanding, basic and diluted	33,813,104	2,685,900	36,499,004
Net loss per share, basic and diluted	$ (0.68)	$ 0.05	$ (0.63)

	Nine Months Ended September 30, 2021 (unaudited)		
	As Reported	Adjustment	As Adjusted
Weighted average shares outstanding, basic and diluted	34,315,047	2,458,053	36,773,100
Net loss per share, basic and diluted	$ (1.12)	$ 0.07	$ (1.05)

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Evaluation of disclosure controls and procedures

Our disclosure controls and procedures are designed to ensure that information we are required to disclose in reports that we file or submit under the Securities Exchange Act of 1934, as amended (the Exchange Act) is recorded, processed, summarized, and reported within the time periods specified in SEC rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Our management, with the participation and supervision of our Chief Executive Officer and our Chief Financial Officer, have evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of the end of the period covered by this Annual Report on Form 10-K. Based on such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that as of such date, our disclosure controls and procedures were, in design and operation, effective at a reasonable assurance level.

Management's annual report on internal control over financial reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f) and Rule 15d-15(f). Our management conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2021 based on the criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. As a result of that

assessment, our management has concluded that our internal control over financial reporting was effective as of December 31, 2021.

This Annual Report on Form 10-K does not include an attestation report of our independent registered public accounting firm on our internal control over financial reporting due to an exemption established by the JOBS Act for emerging growth companies.

Changes in Internal Control

There were no changes in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the period covered by this Annual Report on Form 10-K that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on the Effectiveness of Controls

The effectiveness of any system of internal control over financial reporting, including ours, is subject to inherent limitations, including the exercise of judgment in designing, implementing, operating, and evaluating the controls and procedures, and the inability to eliminate misconduct completely. Accordingly, in designing and evaluating the disclosure controls and procedures, management recognizes that any system of internal control over financial reporting, including ours, no matter how well designed and operated, can only provide reasonable, not absolute assurance of achieving the desired control objectives. Moreover, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. We intend to continue to monitor and upgrade our internal controls as necessary or appropriate for our business but cannot assure you that such improvements will be sufficient to provide us with effective internal control over financial reporting.

Item 9B. Other Information.

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this Item 10 of Form 10-K will be included in our definitive proxy statement to be filed with the SEC within 120 days after the end of the fiscal year ended December 31, 2021 in connection with the solicitation of proxies for our 2022 Annual Meeting of Stockholders ("2022 Proxy Statement") and is incorporated herein by reference.

Item 11. Executive Compensation.

The information required by this Item 11 of Form 10-K will be included in our 2022 Proxy Statement and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information required by this Item 12 of Form 10-K, including with respect to our equity compensation plans, will be included in our 2022 Proxy Statement and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by this Item 13 of Form 10-K will be included in our 2022 Proxy Statement and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

The information required by this Item 14 of Form 10-K will be included in our 2022 Proxy Statement and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) List the following documents filed as a part of the report:

(1) All financial statements;

See Index to Financial Statements in Part II, Item 8 of this Annual Report on Form 10-K.

(2) Financial Statement Schedules

All financial statement schedules have been omitted because the required information was not applicable or was not present in amounts sufficient to require submission of the schedules, or because the information required is included in the financial statements or the accompanying notes.

(3) Exhibits

The exhibits listed in the following Index to Exhibits are filed, furnished or incorporated by reference as part of this Annual Report on Form 10-K.

Index to Exhibits

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
3.1	Amended and Restated Certificate of Incorporation of the Company	10-Q	001-39503	3.1	November 12, 2020
3.2	Amended and Restated Bylaws of the Company	10-Q	001-39503	3.2	November 12, 2020
4.1	Specimen Common Stock Certificate of the Registrant	S-1/A	333-248428	4.1	September 14, 2020
4.2	Investors' Rights Agreement, dated May 29, 2020, as amended, by and among the Registrant and the Investors and Key Holders party thereto	S-1/A	333-248428	4.2	September 9, 2020
4.3	Description of Capital Stock	10-K	001-39503	4.3	March 25, 2021
10.1**	Form of Director and Executive Officer Indemnification Agreement	S-1	333-248428	10.1	August 26, 2020
10.2**	2014 Equity Incentive Plan, as amended	S-1/A	333-248428	10.2	September 9, 2020
10.3**	2020 Equity Incentive Plan	S-1/A	333-248428	10.5	September 9, 2020
10.4**	Form of Stock Option Agreement under the 2020 Equity Incentive Plan	S-1/A	333-248428	10.6	September 9, 2020
10.5**	Form of Restricted Stock Award Agreement under the 2020 Equity Incentive Plan	S-1/A	333-248428	10.7	September 9, 2020
10.6**	Form of RSU Agreement under the 2020 Equity Incentive Plan	S-1/A	333-248428	10.8	September 9, 2020

10.7†	Amended and Restated Standard Exclusive Licensing Agreement with Sublicensing Terms, dated October 28, 2015, by and between the Registrant and Washington State University, and amendments thereto	S-1	333-248428	10.9	August 26, 2020
10.8**	2020 Employee Stock Purchase Plan and Form of Subscription Agreement Thereunder	S-1/A	333-248428	10.10	September 9, 2020
10.9	Lease agreement, dated July 20, 2020, by and between the Registrant and North Creek Parkway Center Investors, LP	S-1/A	333-248428	10.11	September 9, 2020
10.10**	Outside Director Compensation Policy, as amended	8-K	001-39503	10.2	January 31, 2022
10.11**	Executive Incentive Compensation Plan	S-1/A	333-248428	10.13	September 9, 2020
10.12**	Confirmatory Employment Letter between the Registrant and Leen Kawas, Ph.D.	S-1/A	333-248428	10.14	September 9, 2020
10.13**	Confirmatory Employment Letter between the Registrant and Mark Litton, Ph.D.	S-1/A	333-248428	10.15	September 9, 2020
10.14**	Confirmatory Employment Letter between the Registrant and Kevin Church, Ph.D.	S-1/A	333-248428	10.16	September 9, 2020
10.15**	Confirmatory Employment Letter between the Registrant and Glenna Mileson	S-1/A	333-248428	10.17	September 9, 2020
10.16**	Change in Control and Severance Agreement between the Registrant and Leen Kawas, Ph.D.	S-1/A	333-248428	10.18	September 9, 2020
10.17**	Amended and Restated Change in Control and Severance Agreement between the Registrant and Mark Litton, Ph.D.	8-K	001-39503	10.1	January 31, 2022
10.18**	Change in Control and Severance Agreement between the Registrant and Glenna Mileson	S-1/A	333-248428	10.20	September 9, 2020
10.19**	Employment Offer Letter between the Registrant and Hans Moebius, Ph.D.	S-1/A	333-248428	10.21	September 14, 2020
10.20**	Change in Control and Severance Agreement between the Registrant and Hans Moebius, Ph.D.	S-1/A	333-248428	10.22	September 14, 2020
10.21**	Employment Offer Letter between the Registrant and Rachel Lenington	10-Q	001-39503	10.1	August 16, 2021
10.22**	Change in Control and Severance Agreement between the Registrant and Rachel Lenington	10-Q	001-39503	10.2	August 16, 2021
10.23**	Employment Offer Letter between the Registrant and Mark Worthington	10-Q	001-39503	10.3	August 16, 2021
10.24**	Change in Control and Severance Agreement between the Registrant and Mark Worthington	10-Q	001-39503	10.4	August 16, 2021

10.25	First Amendment to Lease by and between the Registrant and Nitrogen Propco 2020, L.P., as successor-in-interest to North Creek Parkway Center Investors, L.P., dated June 28, 2021	10-Q	001-39503	10.5	August 16, 2021
10.26**	Separation Agreement dated October 18, 2021 between the Registrant and Leen Kawas	8-K	001-39503	10.1	October 21, 2021
10.27**	Amendment to Employment Agreement between the Registrant and Hans Moebius, Ph.D.				
10.28**	Change in Control and Severance Agreement between the Registrant and Kevin Church				
21.1	List of subsidiaries of the Registrant	S-1/A	333-24828	21.1	September 9, 2020
23.1	Consent of Independent Registered Public Accounting Firm				
24.1	Power of Attorney (included in signature pages hereto)				
31.1	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
31.2	Certification of Principal Accounting and Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
32.1*	Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
32.2*	Certification of Principal Accounting and Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
101.INS	Inline XBRL Instance Document				
101.SCH	Inline XBRL Taxonomy Extension Schema Document				
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document				
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document				
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document				

101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (formatted in Inline XBRL and included in Exhibit 101)

* The certifications filed as Exhibits 32.1 and 32.2 are not deemed “filed” for purposes of Section 18 of the Securities Exchange Act of 1934 and are not to be incorporated by reference into any filing of the Company under the Securities Act of 1933 or the Securities Exchange Act of 1934, whether made before or after the date hereof irrespective of any general incorporation by reference language contained in any such filing, except to the extent that the registrant specifically incorporates it by reference.

** Indicates a management contract or compensatory plan.

† Pursuant to Item 601(b)(10) of Regulation S-K, certain portions of this exhibit have been omitted by means of marking such portions with asterisks because the Registrant has determined that the information is not material and would likely cause competitive harm to the Registrant if publicly disclosed.

Item 16. Form 10-K Summary

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized.

Athira Pharma, Inc.

Date: March 28, 2022

By: /s/ Mark Litton
Mark Litton
President and Chief Executive Officer (*Principal Executive Officer*)

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Mark Litton and Glenna Mileson, and each one of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in their name, place and stead, in any and all capacities, to sign any amendments to this Annual Report on Form 10-K and to file the same, with Exhibits thereto and other documents in connection therewith with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact, or substitute or substitutes may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Annual Report on Form 10-K has been signed below by the following persons on behalf of the Registrant in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Mark Litton Mark Litton	President, Chief Executive Officer and Director (*Principal Executive Officer*)	March 28, 2022
/s/ Glenna Mileson Glenna Mileson	Chief Financial Officer (*Principal Financial and Accounting Officer*)	March 28, 2022
/s/ Kelly A. Romano Kelly A. Romano	Chairwoman of the Board of Directors	March 28, 2022
/s/ Joseph Edelman Joseph Edelman	Director	March 28, 2022
/s/ John M. Fluke, Jr. John M. Fluke, Jr.	Director	March 28, 2022
/s/ James A. Johnson James A. Johnson	Director	March 28, 2022
/s/ Barbara Kosacz Barbara Kosacz	Director	March 28, 2022
/s/ Michael Panzara Michael Panzara	Director	March 28, 2022
/s/ Grant Pickering Grant Pickering	Director	March 28, 2022

18706 NORTH CREEK PARKWAY
SUITE 104
BOTHELL, WA 98011

November 17, 2021

Hans Moebius, M.D., Ph. D.

Via Email

Re: Amendment to Employment Agreement

Dear Hans:

Reference is made to that certain employment offer letter dated September 13, 2020 (the "Offer Letter") between you and Athira Pharma, Inc. (the "Company"). As discussed, the Compensation Committee of the Board of Directors of the Company has approved amendments to the terms of your employment as set forth below. Except as otherwise amended hereby, the terms of the Offer Letter remain in full force and effect. Capitalized terms in this letter have the same definitions as the Offer Letter. The amendments are effective retroactive to October 1, 2021.

Base Salary. Section 3 of the Offer Letter entitled "Base Salary" is amended to increase the stated annual base salary to US$430,000 from US$339,500.

Annual Bonus. Section 4 of the Offer Letter entitled "Annual Bonus" is amended to change the reference in the first sentence from the Company's 2020 fiscal year to "each Company fiscal year", and to add the following at the end of the existing paragraph: "In addition, you will be entitled to receive an additional stipend equal to 8.465% of each cash bonus amounts earned, whether pursuant to the prior portions of this paragraph or otherwise, which stipend shall be payable, less any applicable withholdings, at the same time as the related bonus is paid, subject to your continued employment through and until the date of the applicable stipend payment. This stipend is intended to help defray the costs of your benefit contributions, but may be used by you for any purpose."

Employee Benefits. Section 6 of the Offer Letter entitled "Employee Benefits" is amended to increase the stated monthly mandatory and elective benefit-related stipend to US$5,200 from US$4,625. For the avoidance of doubt, this monthly stipend will be paid to you, less applicable withholding, and may be used by you for any purpose. In addition the fourth sentence in such Section 6 is amended in its entirety to read as follows: "The Company will reimburse you for reasonable travel or other expenses incurred by you in the furtherance of or in connection with the performance of your duties under this Agreement, pursuant to the terms of the Company's expense reimbursement policy as may be in effect from time to time; provided, however, that upon the lifting of any applicable travel bans related to COVID-19 as well as a determination in the Company's reasonable discretion that it is safe to travel in light of the COVID-19 pandemic, you will be required to travel to the location of the Company's headquarters (currently Seattle, Washington) once per calendar quarter at the Company's expense for a length of stay to be mutually agreed between you and the Company's Chief Executive Officer; and provided further that in the event you are unable to travel to the Company's headquarters in a given quarter, you

18706 NORTH CREEK PARKWAY
SUITE 104
BOTHELL, WA 98011

shall seek authorization to waive the requirement for such calendar quarter from the Company's Chief Executive Officer (which authorization shall not be unreasonably withheld)."

Please acknowledge, by signing below, that you have accepted this amendment.

Very truly yours,

By: /s/ Mark Litton_____

Mark Litton, Ph.D.

President and Chief Executive Officer

I have read and accepted this amendment:

/s/ Hans Moebius_____

Hans Moebius, M.D., Ph.D.

Dated: November 18, 2021_____

ATHIRA PHARMA, INC.

CHANGE IN CONTROL AND SEVERANCE AGREEMENT

This Change in Control and Severance Agreement (the "Agreement") is made by and between Athira Pharma, Inc., a Delaware corporation (the "Company"), and Kevin Church ("Executive"), effective as of January 31, 2022 (the "Effective Date").

This Agreement provides certain protections to Executive in connection with an involuntary termination of Executive's employment with the Company under the circumstances described in this Agreement, including in connection with a change in control of the Company. Certain capitalized terms used in this Agreement are defined in Section 7 below.

The Company and Executive agree as follows:

1. Term of Agreement. This Agreement will continue indefinitely until terminated by written consent of the parties hereto, or if earlier, upon the date that all of the obligations of the parties hereto with respect to this Agreement have been satisfied.

2. At-Will Employment. The Company and Executive acknowledge that Executive's employment is and will continue to be at-will, as defined under applicable law. No payments, benefits, or provisions under this Agreement will confer upon Executive any right to continue Executive's employment with the Company, nor will they interfere with or limit in any way the right of the Company or Executive to terminate such relationship at any time, with or without cause, to the extent permitted by applicable laws.

3. Severance Benefits.

3.1. Qualifying Termination Outside of the Change in Control Period. In the event of a Qualifying Termination that occurs other than during the Change in Control Period, Executive will receive the following payments and benefits from the Company, subject to the requirements of this Agreement:

(a) Salary Severance. A single, lump sum, cash payment equal to seventy-five percent (75%) of Executive's Salary.

(b) COBRA Severance. Subject to Executive timely electing continuation coverage under the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("COBRA") and further subject to Section 5.3, Executive will receive Company-paid group health, dental and vision coverage for Executive and any of Executive's eligible dependents, as applicable (the "COBRA Severance"), following the Qualifying Termination until the earliest of: (i) nine (9) months following the date of the Qualifying Termination, (ii) the date on which Executive and Executive's eligible dependents (as applicable) become covered under similar plans, or (iii) the expiration of Executive's (and any of Executive's eligible dependents', as applicable) eligibility for continuation coverage under COBRA.

3.2. Qualifying Termination During the Change in Control Period. In the event of a Qualifying Termination that occurs during the Change in Control Period, Executive will receive the following payments and benefits from the Company, subject to the requirements of this Agreement:

(a) Salary Severance. A single, lump sum, cash payment equal to one hundred percent (100%) of Executive's Salary.

(b) Bonus Severance. A single, lump sum, cash payment equal to one hundred percent (100%) of Executive's Target Bonus.

(c) COBRA Severance. Subject to Executive timely electing continuation coverage under COBRA and further subject to Section 5.3, Executive will receive COBRA Severance until the earliest of: (i) twelve (12) months following the date of the Qualifying Termination, (ii) the date on which Executive and Executive's eligible dependents (as applicable) become covered under similar plans, or (iii) the expiration of Executive's (and any of Executive's eligible dependents, as applicable) eligibility for continuation coverage under COBRA.

(d) Vesting Acceleration of Service-based Awards. Vesting acceleration of one hundred percent (100%) of any Service-based Awards that are outstanding and unvested as of the date of the Qualifying Termination.

For the avoidance of doubt, in the event of Executive's Qualifying Termination that occurs prior to a Change in Control, any then outstanding and unvested portion of Executive's Awards will remain outstanding (and unvested) until the earlier of (x) one (1) month following the Qualifying Termination, or (y) a Change in Control that occurs within one (1) month following the Qualifying Termination, solely so that any benefits due on a Qualifying Termination can be provided if the Qualifying Termination occurs during the Change in Control Period (provided that in no event will Executive's stock option Awards or similar Awards remain outstanding beyond the Award's maximum term to expiration). If no Change in Control occurs within one (1) month following a Qualifying Termination, any unvested portion of Executive's Awards automatically and permanently will be forfeited on the date one (1) month following the date of the Qualifying Termination without having vested.

3.3. Termination Other Than a Qualifying Termination. If the termination of Executive's employment does not constitute a Qualifying Termination, then Executive will not be entitled to receive any severance or other benefits in connection with such termination except for those, if any, as may then be established under the Company's then existing severance and benefits plans or programs.

3.4. Non-duplication of Payment or Benefits. For purposes of clarity, in the event of a Qualifying Termination that occurs during the period within one (1) month prior to a Change in Control, any severance payments and benefits to be provided to Executive under Section 3.2 will be reduced by any amounts that already were provided to Executive under Section 3.1. Notwithstanding any provision of this Agreement to the contrary, if Executive is entitled to any cash severance, continued health coverage benefits, vesting acceleration of any Awards, or other severance or separation benefits similar to those provided under this Agreement, by operation of

applicable law or under a plan, policy, contract, or arrangement sponsored by or to which the Company is a party other than this Agreement ("Other Benefits"), then the corresponding severance payments and benefits under this Agreement will be reduced by the amount of Other Benefits paid or provided to Executive.

3.5. Death of Executive. In the event of Executive's death before all payments or benefits Executive is entitled to receive under this Agreement have been provided, the unpaid amounts will be provided to Executive's designated beneficiary, if living, or otherwise to Executive's personal representative in accordance with the terms of this Agreement.

4. Accrued Compensation. On any termination of Executive's employment with the Company, Executive will be entitled to receive all accrued but unpaid vacation, expense reimbursements, wages, and other benefits due to Executive under any Company-provided plans, policies, and arrangements.

5. Conditions to Receipt of Severance.

5.1. Separation Agreement and Release of Claims. Executive's receipt of any severance payments or benefits upon a Qualifying Termination under Sections 3.1 and 3.2 is subject to Executive signing and not revoking the Company's then standard separation agreement and release of claims with the Company (the "Release"), which must become effective and irrevocable no later than the sixtieth (60th) day following the date of the Qualifying Termination (the "Release Deadline Date"). If the Release does not become effective and irrevocable by the Release Deadline Date, Executive will forfeit any right to severance payments or benefits under Section 3.

5.2. Payment Timing. Any lump sum cash severance payments under Section 3 relating to salary severance and any bonus severance will be provided to Executive on the first regularly scheduled payroll date of the Company following the date the Release becomes effective and irrevocable, provided that any additional amounts of such cash severance payments that become payable as a result of a Change in Control occurring within one (1) month after Executive's Qualifying Termination will be paid on the later of (x) the first regularly scheduled payroll date of the Company following the date the Release becomes effective and irrevocable, or (y) the date of the Change in Control, in each case subject to any delay required by Section 5.4 below. Any Service-based Awards that are restricted stock units, performance shares, performance units, and/or similar full value awards ("Full Value Awards") that accelerate vesting under Section 3.2(d) will be settled, subject to any delay required by Section 5.4 below (or the terms of the Full Value Award agreement or other Company plan, policy, or arrangement governing the settlement timing of the Full Value Award to the extent such terms specifically require any such delay in order to comply with the requirements of Section 409A, as applicable), (a) on a date within ten (10) days following the date the Release becomes effective and irrevocable, or (b) if later, in the event of a Qualifying Termination that occurs prior to a Change in Control, on a date on or before the date of completion of the Change in Control.

5.3. COBRA Severance Limitations. If the Company determines in its sole discretion that it cannot provide the COBRA Severance without potentially violating, or being subject to an excise tax under, applicable law (including, without limitation, Section 2716 of the

Public Health Service Act), then in lieu of such COBRA Severance, subject to any delay required by Section 5.4 below, the Company will provide to Executive a taxable monthly payment payable on the last day of a given month (except as provided below in this Section 5.3), in an amount equal to the monthly COBRA premium that Executive would be required to pay to continue Executive's group health coverage in effect on the date of the Qualifying Termination (which amount will be based on the premium rates applicable for the first month of COBRA Severance for Executive and any eligible dependents of Executive) (each, a "COBRA Replacement Payment"), which COBRA Replacement Payments will be made regardless of whether Executive elects COBRA continuation coverage and will end on the earlier of (a) the date upon which Executive obtains other employment, or (b) the date the Company has paid an amount totaling the number of COBRA Replacement Payments equal to the number of months in the applicable COBRA Severance period set forth in clause (i) of Section (b) or Section (c), as applicable. For the avoidance of doubt, the COBRA Replacement Payments may be used for any purpose, including, but not limited to continuation coverage under COBRA, and will be subject to any applicable withholdings. Notwithstanding the foregoing, any COBRA Replacement Payments that otherwise would be payable prior to the date that the Release becomes effective and irrevocable shall be paid in a single lump sum on the first regularly scheduled payroll date of the Company following the date the Release becomes effective and irrevocable, and any remaining COBRA Replacement Payments will be paid in accordance with the schedule described further above in this Section 5.3, in each case subject to any delay required by Section 5.4 below). Notwithstanding anything to the contrary under this Agreement, if the Company determines in its sole discretion at any time that it cannot provide the COBRA Replacement Payments without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), Executive will not receive the COBRA Replacement Payments or any further COBRA Severance.

5.4. Section 409A. The Company intends that all payments and benefits provided under this Agreement or otherwise are exempt from, or comply with, the requirements of Section 409A so that none of the payments or benefits will be subject to the additional tax imposed under Section 409A, and any ambiguities and ambiguous terms in this Agreement will be interpreted in accordance with this intent. No payments or benefits to be provided to Executive, if any, under this Agreement or otherwise, when considered together with any other severance payments or separation benefits that are considered deferred compensation under Section 409A (together, the "Deferred Payments") will be paid or otherwise provided until Executive has a "separation from service" within the meaning of Section 409A. To the extent required to be exempt from or comply with Section 409A, references to the termination of Executive's employment or similar phrases used in this Agreement will mean Executive's "separation from service" within the meaning of Section 409A.

(a) Any payments or benefits paid or provided under this Agreement that satisfy the requirements of the "short-term deferral" rule under Treasury Regulations Section 1.409A-1(b)(4), or that qualify as payments made as a result of an involuntary separation from service under Treasury Regulations Section 1.409A-1(b)(9)(iii) that is within the limit set forth thereunder, will not constitute Deferred Payments for purposes of this Section 5.4.

(b) Notwithstanding any provisions to the contrary in this Agreement, if Executive is a "specified employee" within the meaning of Section 409A at the time of Executive's

separation from service (other than due to death), then any payments or benefits under this Agreement that constitute Deferred Payments payable within the first six (6) months after Executive's separation from service instead will be payable on the date six (6) months and one (1) day after Executive's separation from service; provided that in the event of Executive's death within such six (6) month period, any payments delayed by this subsection (b) will be paid to Executive in a lump sum as soon as administratively practicable after the date of Executive's death. To the extent that Executive is not a specified employee but Executive's Qualifying Termination occurs at a time during the year whereby the Release Deadline Date will occur in the year immediately following the year in which the Qualifying Termination occurs, then any payments or benefits under this Agreement that constitute Deferred Payments that otherwise would be payable prior to the Release Deadline Date instead will be paid on the first regularly scheduled payroll date of the Company following the Release Deadline Date.

(c) The Company reserves the right to amend this Agreement as it considers necessary or advisable, in its sole discretion and without the consent of Executive or any other individual, to comply with any provision required to avoid the imposition of the additional tax imposed under Section 409A or to otherwise avoid income recognition under Section 409A prior to the actual payment of any benefits or imposition of any additional tax. Each payment, installment, and benefit payable under this Agreement is intended to constitute a separate payment for purposes of Treasury Regulations Section 1.409A-2(b)(2). In no event will Executive have any discretion to choose Executive's taxable year in which any payments or benefits are provided under this Agreement. In no event will the Company or any parent, subsidiary or other affiliate of the Company have any responsibility, liability or obligation to reimburse, indemnify or hold harmless Executive for any taxes, penalties or interest that may be imposed, or other costs that may be incurred, as a result of Section 409A.

6. Limitation on Payments.

6.1. Reduction of Severance Benefits. If any payment or benefit that Executive would receive from the Company or any other party whether in connection with the provisions in this Agreement or otherwise (the "Payments") would (a) constitute a "parachute payment" within the meaning of Section 280G of the Code and (b) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "Excise Tax"), then the Payments will be either delivered in full, or delivered as to such lesser extent that would result in no portion of the Payments being subject to the Excise Tax, whichever of the foregoing amounts, taking into account the applicable federal, state and local income taxes and the Excise Tax, results in Executive's receipt, on an after-tax basis, of the greatest amount of Payments, notwithstanding that all or some of the Payments may be subject to the Excise Tax. If a reduction in Payments is made in accordance with the immediately preceding sentence, the reduction will occur, with respect to the Payments considered parachute payments within the meaning of Code Section 280G, in the following order: (i) reduction of cash payments in reverse chronological order (that is, the cash payment owed on the latest date following the occurrence of the event triggering the Excise Tax will be the first cash payment to be reduced); (ii) cancellation of equity awards that were granted "contingent on a change in ownership or control" within the meaning of Section 280G of the Code in the reverse order of date of grant of the equity awards (that is, the most recently granted equity awards will be cancelled first); (iii) reduction of the accelerated vesting of equity awards in the

reverse order of date of grant of the equity awards (that is, the vesting of the most recently granted equity awards will be cancelled first); and (iv) reduction of employee benefits in reverse chronological order (that is, the benefit owed on the latest date following the occurrence of the event triggering the Excise Tax will be the first benefit to be reduced). In no event will Executive have any discretion with respect to the ordering of Payment reductions. Executive will be solely responsible for the payment of all personal tax liability that is incurred as a result of the payments and benefits received under this Agreement, and neither the Company nor any parent, subsidiary or other affiliate of the Company have any responsibility, liability or obligation to reimburse, indemnify or hold harmless Executive for any of those payments of personal tax liability.

6.2. Determination of Excise Tax Liability. Unless the Company and Executive otherwise agree in writing, any determinations required under this Section 6 will be made in writing by a nationally recognized accounting or valuation firm (the "Firm") selected by the Company, whose determinations will be conclusive and binding upon Executive and the Company for all purposes. For purposes of making the calculations required by this Section 6, the Firm may make reasonable assumptions and approximations concerning applicable taxes and may rely on reasonable, good faith interpretations concerning the application of Sections 280G and 4999 of the Code. The Company and Executive will furnish to the Firm such information and documents as the Firm reasonably may request in order to make determinations under this Section 6. The Company will bear the costs and make all payments required to be made to the Firm for the Firm's services that are rendered in connection with any calculations contemplated by this Section 6. The Company will have no liability to Executive for the determinations of the Firm.

7. Definitions. The following terms referred to in this Agreement will have the following meanings:

7.1. "Award" means stock options and other equity awards covering shares of Company common stock granted to Executive.

7.2. "Board" means the Company's Board of Directors.

7.3. "Cause" means Executive's: (a) indictment or conviction of any felony or any crime involving dishonesty or moral turpitude; (b) participation in any fraud against the Company or other dishonesty which is not the result of an innocent or inadvertent mistake by Executive with respect to the Company; (c) willful violation of Executive's obligations to the Company after there has been delivered to Executive a written demand for performance from the Board which describes the basis for the Board's belief that Executive has not substantially satisfied Executive's obligations to the Company; (d) continued violation or breach of any material written Company policy, agreement with the Company, or any statutory or fiduciary duty to the Company after there has been delivered to you a written notification of such violation or breach; or (e) damaging or misappropriating or attempting to damage or misappropriate any property, including intellectual property, of the Company.

7.4. "Change in Control" means the first occurrence of any of the following events on or after the Effective Date:

(a) Change in Ownership of the Company. A change in the ownership of the Company which occurs on the date that any one person, or more than one person acting as a group ("Person"), acquires ownership of the stock of the Company that, together with the stock held by such Person, constitutes more than fifty percent (50%) of the total voting power of the stock of the Company; provided, however, that for purposes of this subsection, the acquisition of additional stock by any one Person, who is considered to own more than fifty percent (50%) of the total voting power of the stock of the Company will not be considered a Change in Control; provided, further, that any change in the ownership of the stock of the Company as a result of a private financing of the Company that is approved by the Board also will not be considered a Change in Control. Further, if the stockholders of the Company immediately before such change in ownership continue to retain immediately after the change in ownership, in substantially the same proportions as their ownership of shares of the Company's voting stock immediately prior to the change in ownership, direct or indirect beneficial ownership of fifty percent (50%) or more of the total voting power of the stock of the Company or of the ultimate parent entity of the Company, such event shall not be considered a Change in Control under this subsection (a). For this purpose, indirect beneficial ownership shall include, without limitation, an interest resulting from ownership of the voting securities of one or more corporations or other business entities which own the Company, as the case may be, either directly or through one or more subsidiary corporations or other business entities; or

(b) Change in Effective Control of the Company. If the Company has a class of securities registered pursuant to Section 12 of the U.S. Securities Exchange Act of 1934, as amended, a change in the effective control of the Company which occurs on the date that a majority of members of the Board is replaced during any twelve (12) month period by Directors whose appointment or election is not endorsed by a majority of the members of the Board prior to the date of the appointment or election. For purposes of this subsection (b), if any Person is considered to be in effective control of the Company, the acquisition of additional control of the Company by the same Person will not be considered a Change in Control; or

(c) Change in Ownership of a Substantial Portion of the Company's Assets. A change in the ownership of a substantial portion of the Company's assets which occurs on the date that any Person acquires (or has acquired during the twelve (12) month period ending on the date of the most recent acquisition by such Person or Persons) assets from the Company that have a total gross fair market value equal to or more than fifty percent (50%) of the total gross fair market value of all of the assets of the Company immediately prior to such acquisition or acquisitions; provided, however, that for purposes of this subsection (c), the following will not constitute a change in the ownership of a substantial portion of the Company's assets: (i) a transfer to an entity that is controlled by the Company's stockholders immediately after the transfer, or (ii) a transfer of assets by the Company to: (A) a stockholder of the Company (immediately before the asset transfer) in exchange for or with respect to the Company's stock, (B) an entity, fifty percent (50%) or more of the total value or voting power of which is owned, directly or indirectly, by the Company, (C) a Person, that owns, directly or indirectly, fifty percent (50%) or more of the total value or voting power of all the outstanding stock of the Company, or (D) an entity, at least fifty percent (50%) of the total value or voting power of which is owned, directly or indirectly, by a Person described in this subsection (c)(ii)(C). For purposes of this subsection (c), gross fair market

value means the value of the assets of the Company, or the value of the assets being disposed of, determined without regard to any liabilities associated with such assets.

For purposes of this definition, persons will be considered to be acting as a group if they are owners of a corporation that enters into a merger, consolidation, purchase or acquisition of stock, or similar business transaction with the Company.

Notwithstanding the foregoing, a transaction will not be deemed a Change in Control unless the transaction qualifies as a change in control event within the meaning of Section 409A. Further and for the avoidance of doubt, a transaction will not constitute a Change in Control if: (x) its sole purpose is to change the jurisdiction of the Company's incorporation, or (y) its sole purpose is to create a holding company that will be owned in substantially the same proportions by the persons who held the Company's securities immediately before such transaction.

7.5. "Change in Control Period" means the period beginning on the date one (1) month prior to a Change in Control and ending on (and inclusive of) the date that is the one (1) year anniversary of a Change in Control.

7.6. "Code" means the Internal Revenue Code of 1986, as amended. Reference to a specific section of the Code or regulation thereunder will include such section or regulation, any valid regulation promulgated under such section, and any comparable provision of any future legislation or regulation amending, supplementing or superseding such section or regulation.

7.7. "Confidentiality Agreement" means Executive's At-will Employment, Confidential Information, Invention Assignment, and Arbitration Agreement entered into with the Company dated September 8, 2020.

7.8. "Director" means a member of the Board.

7.9. "Disability" means total and permanent disability as defined in Code Section 22(e)(3).

7.10. "Good Reason" means Executive's termination of Executive's employment with the Company within thirty (30) days following the end of the Company's Cure Period (as defined below) as a result of the occurrence of any of the following without Executive's written consent: (a) a material reduction in Executive's duties or responsibilities that is inconsistent with Executive's position, provided that a mere change of title alone shall not constitute such a material reduction; (b) the requirement that Executive change Executive's principal office to a facility that increases Executive's commute by more than forty (40) miles from Executive's commute to the location at which Executive was employed prior to such change; or (c) a material reduction in Executive's base salary or a material reduction in Executive's employee benefits (e.g., medical, dental, insurance, short- and long-term disability insurance and 401(k) retirement plan benefits, collectively (the "Employee Benefits") to which Executive is entitled immediately prior to such reduction (other than (x) in connection with a general decrease in the annual base salary or Employee Benefits of all similarly situated employees, and (y) following the Change in Control, to the extent necessary to make Executive's annual base salary or Employee Benefits

commensurate with those of other employees of the Company or its successor entity or parent entity who are similarly situated with Executive following such Change in Control); provided, however, that Executive must provide written notice to the Board of the condition that could constitute a "Good Reason" event within ninety (90) days following the initial existence of such condition and such condition must not have been remedied by the Company within thirty (30) days (the "Cure Period") of such written notice. To the extent Executive's primary work location is not the Company's corporate offices due to a shelter-in-place order, quarantine order, or similar work-from-home requirement that applies to Executive, Executive's primary office location, from which a change in location under the foregoing clause (b) will be measured, will be considered the Company's office location where Executive's employment with the Company primarily was based immediately prior to the commencement of such shelter-in-place order, quarantine order, or similar work-from-home requirement.

7.11. "Qualifying Termination" means a termination of Executive's employment with the Company either (a) by the Company without Cause and other than due to Executive's death or Disability, or (b) by Executive for Good Reason.

7.12. "Salary" means Executive's annual base salary in effect immediately prior to Executive's Qualifying Termination (or, if the termination is due to a resignation for Good Reason based on a material reduction in Executive's base salary, then Executive's annual base salary in effect immediately prior to the reduction) or, if Executive's Qualifying Termination occurs during the Change in Control Period and the amount is greater, Executive's annual base salary in effect immediately prior to the Change in Control.

7.13. "Section 409A" means Code Section 409A and the Treasury Regulations and guidance thereunder, and any applicable state law equivalent, as each may be promulgated, amended or modified from time to time.

7.14. "Service-based Awards" means Awards that, as of the date of the Qualifying Termination, or in the case of a Qualifying Termination during the Change in Control Period, the later of the date of the Qualifying Termination or immediately prior to the Change in Control, are held by Executive and subject to continued service-based vesting criteria, but not subject to the achievement of any performance-based or other similar vesting criteria.

7.15. "Target Bonus" means Executive's annual (or annualized, if applicable) target bonus in effect immediately prior to Executive's Qualifying Termination or, if Executive's Qualifying Termination occurs during the Change in Control Period and the amount is greater, Executive's annual (or annualized, if applicable) target bonus in effect immediately prior to the Change in Control.

8. Successors. This Agreement will be binding upon and inure to the benefit of (a) the heirs, executors, and legal representatives of Executive upon Executive's death, and (b) any successor of the Company. Any such successor of the Company will be deemed substituted for the Company under the terms of this Agreement for all purposes. For this purpose, "successor" means any person, firm, corporation, or other business entity which at any time, whether by purchase, merger, or otherwise, directly or indirectly acquires all or substantially all of the assets or business of the Company. None of the rights of Executive to receive any form of compensation

payable pursuant to this Agreement may be assigned or transferred except by will or the laws of descent and distribution. Any other attempted assignment, transfer, conveyance, or other disposition of Executive's right to compensation or other benefits will be null and void.

9. Notice.

9.1. General. All notices and other communications required or permitted under this Agreement will be in writing and will be effectively given (a) upon actual delivery to the party to be notified, (b) upon transmission by email, (c) twenty-four (24) hours after confirmed facsimile transmission, (d) one (1) business day after deposit with a recognized overnight courier, or (e) three (3) business days after deposit with the U.S. Postal Service by first class certified or registered mail, return receipt requested, postage prepaid, addressed: (i) if to Executive, at the address Executive will have most recently furnished to the Company in writing, (ii) if to the Company, at the following address:

Athira Pharma, Inc.
18706 North Creek Parkway, Suite 104
Bothell, Washington 98011
Attention: Chief Executive Officer

9.2. Notice of Termination. Any termination of Executive's employment by the Company for Cause will be communicated by a notice of termination of Executive's employment to Executive, and any termination by Executive for Good Reason will be communicated by a notice of termination to the Company, in each case given in accordance with Section 9.1. The notice will indicate the specific termination provision in this Agreement relied upon, will set forth in reasonable detail the facts and circumstances claimed to provide a basis for termination under the provision so indicated, and will specify the termination date (which will be not more than thirty (30) days after the later of (a) the giving of the notice or (b) the end of any applicable cure period).

10. Resignation. The termination of Executive's employment for any reason also will constitute, without any further required action by Executive, Executive's voluntary resignation from all officer and/or director positions held at the Company or any of its subsidiaries or affiliates, and at the Board's request, Executive will execute any documents reasonably necessary to reflect the resignations.

11. Miscellaneous Provisions.

11.1. No Duty to Mitigate. Executive will not be required to mitigate the amount of any payment contemplated by this Agreement, nor will any payment be reduced by any earnings that Executive may receive from any other source except as specified in Sections 3.4, 5.4 and 6.

11.2. Waiver; Amendment. No provision of this Agreement will be modified, waived or discharged unless the modification, waiver or discharge is agreed to in writing and signed by an authorized officer of the Company (other than Executive) and by Executive. No waiver by either party of any breach of, or of compliance with, any condition or provision of this Agreement by the other party will be considered a waiver of any other condition or provision or of the same condition or provision at another time.

11.3. Headings. Headings are provided herein for convenience only, and will not serve as a basis for interpretation or construction of this Agreement.

11.4. Entire Agreement. This Agreement, together with the Confidentiality Agreement and Executive's confirmatory employment letter agreement with the Company dated September 9, 2020 constitutes the entire agreement of the parties and supersedes in their entirety all prior representations, understandings, undertakings or agreements (whether oral or written and whether expressed or implied) of the parties with respect to the subject matter of this Agreement.

11.5. Governing Law. This Agreement will be governed by the laws of the State of Washington but without regard to the conflict of law provision. To the extent that any lawsuit is permitted with respect to any provisions under this Agreement, Executive hereby expressly consents to the personal and exclusive jurisdiction and venue of the state and federal courts located in the State of Washington for any lawsuit filed against Executive by the Company.

11.6. Severability. If any provision of this Agreement is or becomes or is deemed to be invalid, illegal, or unenforceable for any reason, such invalidity, illegality, or unenforceability will not affect the remaining parts of this Agreement, and this Agreement will be construed and enforced as if the invalid, illegal, or unenforceable provision had not been included.

11.7. Withholding. The Company (and any parent, subsidiary or other affiliate of the Company, as applicable) will have the right and authority to deduct from any payments or benefits all applicable federal, state, local, and/or non-U.S. taxes or other required withholdings and payroll deductions ("Withholdings"). Prior to the payment of any amounts or provision of any benefits under this Agreement, the Company (and any parent, subsidiary or other affiliate of the Company, as applicable) is permitted to deduct or withhold, or require Executive to remit to the Company, an amount sufficient to satisfy any applicable Withholdings with respect to such payments and benefits. Neither the Company nor any parent, subsidiary or other affiliate of the Company will have any responsibility, liability or obligation to pay Executive's taxes arising from or relating to any payments or benefits under this Agreement.

11.8. Counterparts. This Agreement may be executed in counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument.

[Signature page follows]

By her, his, or its signature below, each of the parties signifies its acceptance of the terms of this Agreement, in the case of the Company by its duly authorized officer.

COMPANY **ATHIRA PHARMA, INC.**

By: /s/ Mark Litton
Mark Litton

Title: Chief Executive Officer

Date: January 31, 2022

EXECUTIVE

By: /s/ Kevin Church
Kevin Church

Date: January 31, 2022

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

(1) Form S-3 No. 333-261073 of Athira Pharma, Inc.; and

(2) Form S-8 Nos. 333-254735 and 333-248910, pertaining to the 2020 Equity Incentive Plan, the 2020 Employee Stock Purchase Plan, and the 2014 Equity Incentive Plan, as amended, of Athira Pharma, Inc.

of our report dated March 28, 2022, with respect to the consolidated financial statements of Athira Pharma, Inc., included in this Annual Report (Form 10-K) of Athira Pharma, Inc. for the year ended December 31, 2021.

/s/ Ernst & Young LLP

Seattle, Washington
March 28, 2022

Exhibit 31.1

CERTIFICATION OF THE PRINCIPAL EXECUTIVE OFFICER PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Mark Litton, certify that:

1. I have reviewed this Annual Report on Form 10-K of Athira Pharma, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d–15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 28, 2022

/s/ Mark Litton

Mark Litton
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF THE PRINCIPAL FINANCIAL OFFICER PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Glenna Mileson, certify that:

1. I have reviewed this Annual Report on Form 10-K of Athira Pharma, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d–15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 28, 2022

/s/ Glenna Mileson

Glenna Mileson
Chief Financial Officer
(Principal Financial and Accounting Officer)

Exhibit 32.1

ATHIRA PHARMA, INC.
CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Athira Pharma, Inc. (the "Company") for the fiscal year ended December 31, 2021, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Mark Litton, President and Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 28, 2022

/s/ Mark Litton
Mark Litton
President and Chief Executive Officer
(Principal Executive Officer)

This certification accompanies the Report to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Athira Pharma, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Report), irrespective of any general incorporation language contained in such filing.

Exhibit 32.2

ATHIRA PHARMA, INC.
CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Athira Pharma, Inc. (the "Company") for the fiscal year ended December 31, 2021, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Glenna Mileson, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 28, 2022

/s/ Glenna Mileson
Glenna Mileson
Chief Financial Officer
(Principal Financial and Accounting Officer)

This certification accompanies the Report to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Athira Pharma, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Report), irrespective of any general incorporation language contained in such filing.