

**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: 000-29959

Cassava Sciences, Inc.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

91-1911336
(I.R.S. Employer
Identification Number)

7801 N. Capital of Texas Highway, Suite 260, Austin, TX 78731
(512) 501-2444

(Address, including zip code, of registrant's principal executive offices and
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, \$0.001 par value	SAVA	NASDAQ Capital 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 Section 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. (Check one):

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 USC. 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 Act). Yes No

The aggregate market value of the voting and non-voting common equity held by non-affiliates was approximately \$3.2 billion computed by reference to the last sales price of \$85.44 as reported on the Nasdaq Capital Market, as of the last business day of the Registrant's most recently completed second fiscal quarter, June 30, 2021. The number of shares outstanding of the Registrant's common stock, par value \$0.001 per share, on February 24, 2022 was 40,016,792.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's proxy statement for its 2022 Annual Meeting of Stockholders (the "Proxy Statement"), to be filed with the U.S. Securities and Exchange Commission, no later than 120 days after the Registrant's fiscal year ended December 31, 2021, are incorporated by reference to Part III of this Annual Report on Form 10-K.

CASSAVA SCIENCES, INC.

FORM 10-K
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PART I

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K and the documents incorporated by reference contain forward-looking statements within the meaning of the Private Securities Reform Act of 1995. All statements other than statements of historical facts contained in this Annual Report are forward-looking statements. We intend that such statements be protected by the safe harbor created thereby. Forward-looking statements relate to expectations, beliefs, projections, future plans and strategies, anticipated events or trends and similar expressions concerning matters that are not historical facts. In some cases, you can identify forward-looking statements by terms such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “should,” “will” and “would” or the negatives of these terms or other comparable terminology.

The forward-looking statements are based on our beliefs, assumptions and expectations of our future performance, taking into account all information currently available to us. Forward-looking statements involve risks and uncertainties and our actual results and the timing of events may differ significantly from the results discussed in the forward-looking statements. Such forward-looking statements and our business are subject to numerous risks and uncertainties that you should consider before investing in our Company. These risks are described more fully in the section titled “Risk Factors.” Accordingly, you should not rely upon forward-looking statements as predictions of future events. Examples of such forward-looking statements include, but are not limited to statements about:

- the number of patients with Alzheimer’s disease we expect to enroll in our on-going Phase 3 studies, the enrollment rates for and the length of time to complete our studies, the geographic areas for patient enrollment, and the expected safety profile or treatment benefits of simufilam for people with Alzheimer’s disease;
- our reliance on third-party contractors to conduct the clinical trials and make drug supply on a large-scale for our Phase 3 clinical program, or their ability to do so on-time or on-budget;
- limitations around the interpretation of improvements in cognition scores observed in interim analyses in our long-term open-label study, as compared to efficacy results from a fully completed, randomized controlled study design;
- the ability of clinical scales to assess cognition or health in our trials of Alzheimer’s disease;
- announcements or plans regarding any future interim analyses of our open-label study of simufilam and our estimated timeline for doing so;
- any significant changes we may make, or anticipate making, to the design of any of our on-going studies of simufilam in patients with Alzheimer’s disease;
- our ability to initiate, conduct or analyze additional clinical and non-clinical studies with our product candidates targeted at Alzheimer’s disease and other neurodegenerative diseases;
- the interpretation of results from our early clinical studies, such as Phase 1 and Phase 2 studies;
- our plans to further develop SavaDx, our investigational blood-based diagnostic, and to evaluate a non-antibody approach for SavaDx;
- our ability or willingness to expand therapeutic indications for simufilam outside of Alzheimer’s disease
- the safety, efficacy, or potential therapeutic benefits of our product candidates;
- the utility of protection, or the sufficiency, of our intellectual property;
- our potential competitors or competitive products;
- expected future sources of revenue and capital and increasing cash needs;
- our use of a Clinical Research Organization (CRO) to conduct clinical studies of our lead product candidate;
- expectations regarding trade secrets, technological innovations, licensing agreements and outsourcing of certain business functions;
- our expenses increasing or fluctuations in our financial or operating results;
- our operating losses, anticipated operating and capital expenditures and legal expenses;;
- expectations regarding the issuance of shares of common stock to employees pursuant to equity compensation awards, net of employment taxes;
- the development and maintenance of our internal information systems and infrastructure;
- our need to hire additional personnel and our ability to attract and retain such personnel;
- existing regulations and regulatory developments in the United States and other jurisdictions in which we operate;
- our plans to expand the size and scope of our operations and physical facilities;
- the sufficiency of our current resources to continue to fund our operations;

- the accuracy of our estimates regarding expenses, capital requirements, and needs for additional financing;
- assumptions and estimates used for our disclosures regarding stock-based compensation;
- the expense, timing and outcome of pending or future litigation or other legal proceedings and claims, including U.S. government inquiries;
- litigation, claims or other uncertainties that may arise from allegations made against us or our collaborators; and
- the impact of COVID-19, a novel coronavirus first detected in 2019, on our operations and financial condition.

Drug development and commercialization involve a high degree of risk, and only a small number of research and development programs result in regulatory approval and subsequent commercialization of a product. Our clinical results from earlier-stage clinical trials may not be indicative of full results or results from later-stage or larger scale clinical trials and do not ensure regulatory approval. You should not place undue reliance on these statements or any scientific data we present or publish.

We cannot assure you that we will realize the results or developments we expect or anticipate or, even if substantially realized, that they will result in the consequences or affect us or our operations in the way we expect. The forward-looking statements included in this Annual Report on Form 10-K are made only as of the date hereof. We undertake no obligation to publicly update or revise any forward-looking statement as a result of new information, future events or otherwise, except as required by law.

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 while 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 an exhaustive 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.

Our research programs in neurodegeneration have benefited from longstanding scientific and financial support from the National Institutes of Health (NIH). The contents of this Annual Report are solely our responsibility and do not necessarily represent any official views of NIH.

Item 1. Business

Overview

Cassava Sciences, Inc. is a clinical-stage biotechnology company based in Austin, Texas. Our mission is to detect and treat neurodegenerative diseases, such as Alzheimer’s disease. Our novel science is based on stabilizing – but not removing – a critical protein in the brain.

Over the past 10 years, we have combined state-of-the-art technology with new insights in neurobiology to develop novel solutions for Alzheimer’s disease and other neurodegenerative diseases. Our strategy is to leverage our unique scientific/clinical platform to develop a first-in-class program for treating neurodegenerative diseases, such as Alzheimer’s.

We currently have two biopharmaceutical assets under development:

- our lead therapeutic product candidate, called simufilam, is a novel treatment for Alzheimer’s disease; and
- our lead investigational diagnostic product candidate, called SavaDx, is a novel way to detect the presence of Alzheimer’s disease from a small sample of blood.

Our scientific approach for the treatment of Alzheimer’s disease seeks to simultaneously suppress *both* neurodegeneration and neuroinflammation. We believe our ability to improve multiple vital functions in the brain represents a new, different and crucial approach to address Alzheimer’s disease.

Our lead therapeutic product candidate, simufilam, is a proprietary small molecule (oral) drug. Simufilam targets an altered form of a protein called filamin A (FLNA) in the Alzheimer’s brain. Published studies have demonstrated that the altered form of FLNA causes neuronal dysfunction, neuronal degeneration and neuroinflammation.

We believe simufilam improves brain health by reverting altered FLNA back to its native, healthy conformation, thus countering the downstream toxic effects of altered FLNA. We have generated and published experimental and clinical evidence of improved brain health with simufilam. Importantly, simufilam is not dependent on clearing amyloid from the brain. Since simufilam has a unique mechanism of action, we believe its potential therapeutic effects may be additive or synergistic with those of other therapeutic candidates aiming to treat neurodegeneration.

Simufilam has demonstrated a multitude of treatment effects in animal models of disease, including normalizing neurotransmission, decreasing neuroinflammation, suppressing neurodegeneration, and restoring memory and cognition.

Phase 2a Study

In 2019, we completed a small, first-in-patient, clinical-proof-of-concept, open-label Phase 2a study of simufilam in the U.S., with substantial support from the *National Institute on Aging* (NIA), a division of the NIH. Treatment with simufilam for 28 days significantly improved certain key biomarkers of Alzheimer's pathology, neurodegeneration and neuroinflammation ($p < 0.001$). Biomarkers effects were seen in all patients in both cerebrospinal fluid (CSF) and plasma.

Phase 2b Study

In September 2020, we announced final results of a Phase 2b study with simufilam in Alzheimer's disease. In this clinical study funded by the NIH, Alzheimer's patients treated with 50 mg or 100 mg of simufilam twice-daily for 28 days showed statistically significant ($p < 0.05$) improvements in CSF biomarkers of disease pathology, neurodegeneration and neuroinflammation, versus Alzheimer's patients who took placebo. In addition, Alzheimer's patients treated with simufilam showed improvements in validated tests of episodic memory and spatial working memory, versus patients on placebo. Cognitive improvements correlated most strongly with decreases in levels of P-tau181, a biomarker that suggests brain changes from Alzheimer's disease.

Open-label Study Strategy

Much of the value of our ongoing open-label study is to gain data to support simufilam's long-term safety profile in patients.

Clinical data from an open-label study has limitations compared to safety and efficacy data from a fully completed, large, randomized controlled clinical trial. However, we believe there is logic to conducting an open-label study prior to conducting a large, expensive Phase 3 clinical testing program. First, this is a standard clinical method of demonstrating drug safety. Second, we believe that if an experimental drug for Alzheimer's shows no treatment benefits in a well-designed, long-term open-label study, then there is no chance that drug will succeed in Phase 3 clinical testing. The opposite is not true: encouraging treatment effects in an open-label study is not proof of drug safety or efficacy, nor can encouraging treatment effects predict clinical success in a Phase 3 program.

We believe a well-designed, long-term, open-label study is an exercise in prudent risk-management. Clinical results may serve as a tool to help inform and manage the inherent risks and uncertainties of drug development prior to undertaking a large, expensive Phase 3 clinical testing program.

We also believe the use of interim analyses in our open-label study is a rational approach to inform the design of ongoing, pending, or future clinical studies. An interim analysis is a form of preliminary scientific enquiry that evaluates clinical data before a study is concluded, before patient enrollment has been completed and before data validation procedures are conducted to ensure the final clinical dataset is valid and accurate. Interim, "top-line" and preliminary data from our open-label clinical trial that we announce or publish from time to time are likely to change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final clinical dataset.

Open-label Study Results

In March 2020, we initiated a long-term, open-label study to evaluate simufilam, our lead drug candidate, in patients with Alzheimer's disease. This study is funded in part by a research grant award from the National Institutes of Health (NIH). The study is intended to monitor the long-term safety and tolerability of simufilam 100 mg twice daily for 12 or

more months. Another study objective is to measure changes in cognition and biomarkers. This study uses ADAS-Cog to measure changes in cognition and the Neuropsychiatric Inventory (NPI) to assess dementia-related behavior. Both scales are both standard clinical tools in trials of Alzheimer’s disease.

In September 2021, the open-label study reached its final target enrollment of approximately 200 subjects with mild-to-moderate Alzheimer’s disease. To date, drug is safe and well-tolerated.

The open-label study protocol has pre-specified interim analyses, including cognition measurements at 6, 9 and 12 months.

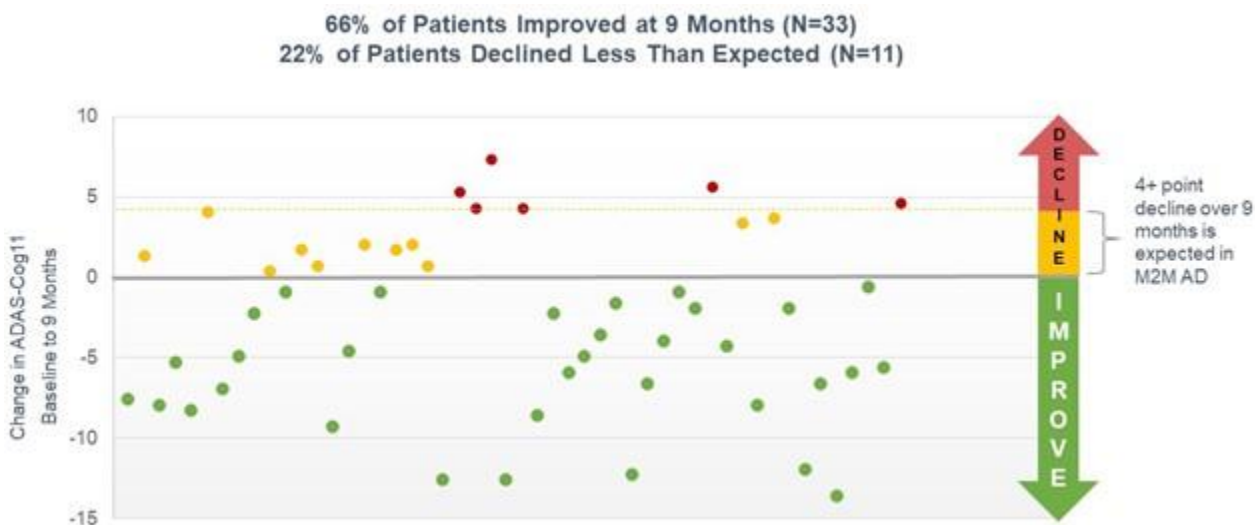
6-month Interim Analysis. In February 2021, we announced top-line results of a preplanned interim analysis of our open-label study with simufilam. This interim analysis summarized clinical data in the first 50 patients who had completed at least 6 months of drug treatment. Patients’ cognition and behavior scores improved following six months of simufilam treatment, with no safety issues. Six months of simufilam treatment improved cognition scores by 1.6 points on ADAS-Cog11, a 10% mean improvement from baseline to month 6. In these same patients, simufilam also improved dementia-related behavior, such as anxiety, delusions and agitation, by 1.3 points on the Neuropsychiatric Inventory (NPI), a 29% mean improvement from baseline to month 6.

9-month Interim Analysis. In July 2021, we announced top-line results of a second preplanned interim analysis of our open-label study with simufilam. This interim analysis summarized clinical data on the first 50 patients who had completed at least 9 months of drug treatment. Patients’ cognition and behavior scores improved following nine months of simufilam treatment, with no safety issues. Nine months of simufilam treatment improved cognition scores by 3.0 points on ADAS-Cog11, an 18% mean improvement from baseline to month 9 ($p < 0.001$). Simufilam improved ADAS-Cog scores in 66% of patients at 9 months. An additional 22% of patients declined less than reported in the science literature at 9 months. Cognition outcomes suggest simufilam’s treatment effects were broad-based (Figure 1).

12-month Interim Analysis. In September 2021, we announced top-line results of a third preplanned interim analysis of our open-label study with simufilam. This interim analysis summarized clinical data on the first 50 patients who had completed at least 12 months of drug treatment. Patients’ cognition and behavior scores both improved following twelve months of simufilam treatment, with no safety issues. Twelve months of simufilam treatment improved cognition scores by 3.2 points on ADAS-Cog11 from baseline to month 12 ($p < 0.001$). Sixty-eight percent (68%) of study subjects improved on ADAS-Cog at 12 months; these study subjects improved an average of 6.8 points (S.D. \pm 3.8). An additional 20% of study subjects declined less than 5 points on ADAS-Cog at 12 months; these study subjects declined an average of 2.5 points (S.D. \pm 1.3).

In 2022, we may conduct one or more *ad hoc* interim analyses as the open-label study progresses.

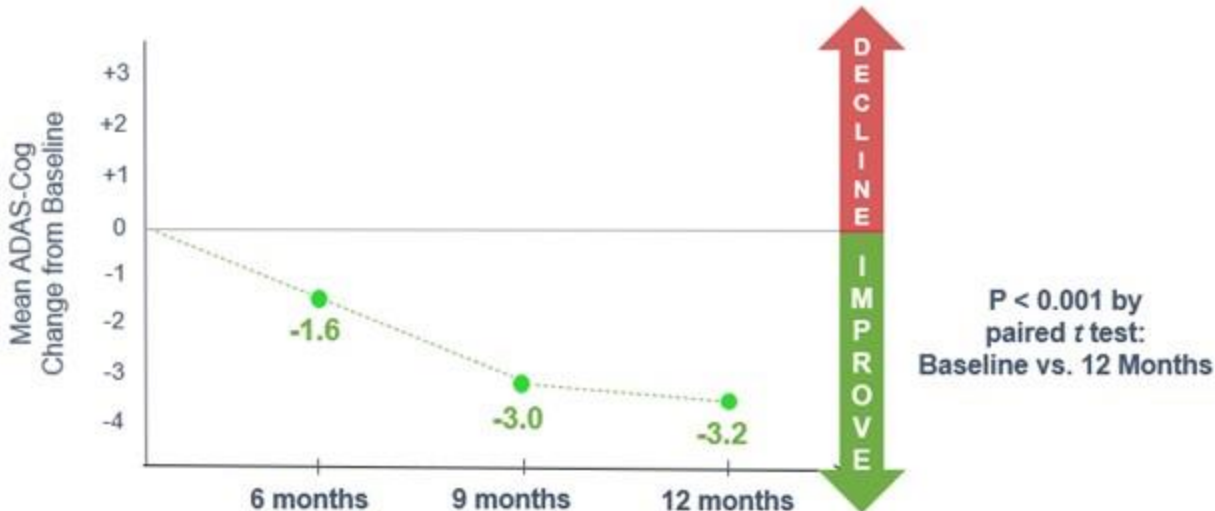
Figure 1. Individual Patient Changes in ADAS-Cog (N=50) at 9 months



Interim analyses summarize clinical data on the first 50 patients who have completed 6, 9, and 12 months of open-label treatment. Baseline values for cognition for each 50-patient cohort will not be the same at months 6, 9 and 12 because some study participants may drop out of the open-label study in-between interim analyses and dropouts are replaced, such that each interim analysis collects data from the first 50 patients who complete each specified time point.

Figure 2. Changes in ADAS-Cog (N=50) at 6, 9 and 12-month Interim Analyses

Cognition scores on ADAS-Cog11 observed in first 50 subjects at 6, 9 and 12 months.



Historical Rates of Cognitive Decline - Alzheimer’s is a progressive disease. Cognition will always decline over time. Historical controls indicate that in patients with mild-to-moderate Alzheimer’s disease, cognition declines an average of 5.5 points on ADAS-Cog over 12 months amongst study subjects administered placebo in randomized, controlled trials, as reported by the science literature¹. As an example of decline in an *early* Alzheimer’s disease population, in 2020, one of our competitors, Biogen, Inc., reported a 5.2-point decline over 18 months on ADAS-Cog amongst study subjects who were administered placebo in two Phase 3 randomized, controlled trials studies with their proprietary drug, aducanumab².

¹ *Disease Progression Meta-analysis Model in Alzheimer’s disease (Ito, et al., Pfizer Global Research), Alzheimer’s & Dementia 6 (2010) 39-53*

² *EMERGE and ENGAGE Topline Results (2020), available on-line.*

Alzheimer's is often accompanied by behavior disorders, such as anxiety, agitation or delusions. Such disorders may come and go over time, but they typically emerge or become more frequent as disease progresses. Simufilam reduced dementia-related behavior at 12 months on the Neuropsychiatric Inventory (NPI), a clinical tool used to measure changes in dementia-related behavior.

- At baseline, 34% of study subjects had no neuropsychiatric symptoms.
- At month 6, 38% of study subjects had no neuropsychiatric symptoms.
- At month 9, over 50% of study subjects had no neuropsychiatric symptoms.
- At month 12, over 50% of study subjects had no neuropsychiatric symptoms.

Biomarker Analysis. Biomarkers are objective biological data. There are no known placebo effects. A key objective of this study is to measure changes in levels of biomarkers in patients before and after 6 months and 12 months of open-label treatment with simufilam.

In July 2021, we announced positive biomarker data from our open-label study. Six months of open label treatment with simufilam robustly improved CSF biomarkers in a cohort of 25 patients with mild-to-moderate Alzheimer's disease. Biomarker data were analyzed from cerebrospinal fluid (CSF) collected from 25 study participants in the open-label study who agreed to undergo a lumbar puncture at baseline and again after 6 months of treatment. CSF bioanalyses were conducted blind by City University of New York (CUNY).

Cerebrospinal fluid (CSF) biomarkers of disease pathology, t-tau and p-tau181, decreased 38% and 18%, respectively (both $p < 0.00001$). CSF biomarkers of neurodegeneration, neurogranin and NfL, decreased 72% and 55%, respectively (both $p < 0.00001$). CSF biomarkers of neuroinflammation, sTREM2 and YKL-40, decreased 65% and 44% (both $p < 0.00001$). All p-values are baseline vs. 6-month levels by paired *t*-test. Figure 3.

Core markers of Alzheimer's pathology are total tau (T-tau), phosphorylated tau (P-tau181), and amyloid beta42 ($A\beta_{42}$). In Alzheimer's, tau levels are elevated and $A\beta_{42}$ is low.

- T-tau decreased 38% ($p < 0.00001$)
- P-tau181 decreased 18% ($p < 0.00001$)
- CSF $A\beta_{42}$ increased 84% ($p < 0.00001$)

Elevated CSF levels of two proteins, neurogranin (Ng) and neurofilament Light Chain (NfL) indicate neurodegeneration.

- Ng decreased 72% ($p < 0.00001$)
- NfL decreased 55% ($p < 0.00001$)

Elevated levels of marker YKL-40 indicate neuroinflammation.

- YKL-40 decreased 44% ($p < 0.00001$)

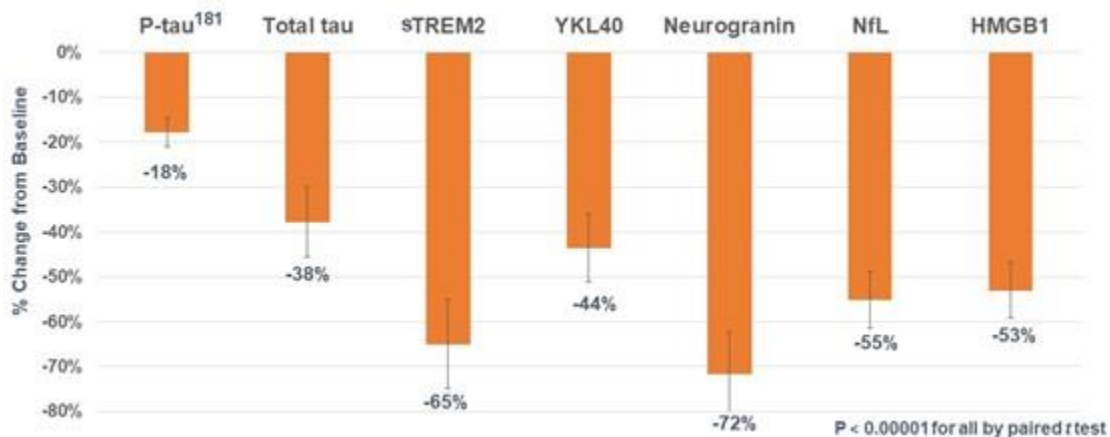
sTREM2 is a biomarker of microglia-induced neuroinflammation that has commanded substantial recent attention from researchers for its role in Alzheimer's and frontotemporal dementia.

- sTREM2 decreased 65% ($p < 0.00001$)

HMGB1 protein, is a damage-related protein sometimes called a 'danger molecule' because it triggers additional neuroinflammation and loss of neurons.

- HMGB1 decreased 53% ($p < 0.00001$)

Figure 3. Significant Decreases in CSF Biomarkers at Month 6



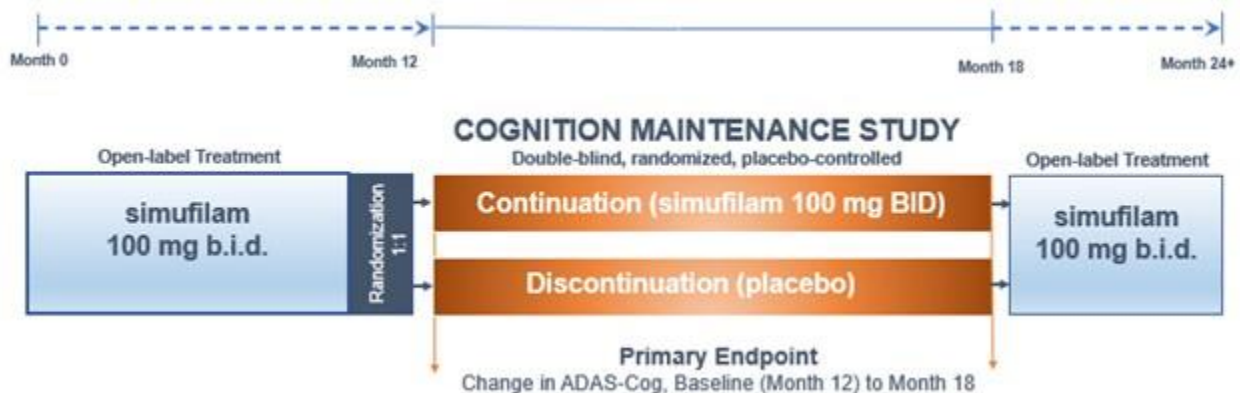
In 2022, we expect to measure CSF biomarkers in approximately 25 study participants who complete 12 months of treatment with open label simufilam.

Cognition Maintenance Study (CMS)

In May 2021, we initiated a Cognition Maintenance Study (CMS). This is a double-blind, randomized, placebo-controlled study of simufilam in patients with mild-to-moderate Alzheimer’s disease. Study subjects are randomized (1:1) to simufilam or placebo for six months. To enroll in the CMS, patients must have previously completed 12 months or more of open-label treatment with simufilam. The CMS is designed to evaluate simufilam’s effects on cognition and health outcomes in Alzheimer’s patients who continue with drug treatment versus patients who discontinue drug treatment. Figure 4.

The target enrollment for the CMS is approximately 100 subjects or more. As of February 2022, over 60 subjects have been enrolled in the CMS and 35 have completed the study.

Figure 4. Cognition Maintenance Study Design



End-of-Phase 2 (EOP2) Meeting with FDA

In January 2021, we held an End-of-phase 2 (EOP2) meeting for simufilam with the U.S. Food and Drug Administration (FDA). The purpose of this EOP2 meeting was to gain general agreement around key elements of a pivotal Phase 3 program to treat Alzheimer’s disease dementia. FDA attendees included Robert Temple, MD, Deputy Center Director for Clinical Science and Senior Advisor in the Office of New Drugs; Billy Dunn, MD, Director, Office of Neuroscience; Eric Bastings, MD, Director, Division of Neurology, and others.

In February 2021, we announced the successful completion of our EOP2 meeting. Official meeting minutes confirm that we and FDA are aligned on key elements of a Phase 3 clinical program for simufilam. FDA has agreed that the completed Phase 2 program, together with an ongoing and well-defined Phase 3 clinical program, are sufficient to show evidence of clinical efficacy for simufilam in Alzheimer’s disease. There is also agreement that the use of separate clinical scales to assess cognition (ADAS-cog¹) and function (ADCS-ADL²) are appropriate co-primary endpoints of efficacy. A clinical scale that combines cognition and function, such as iADRS³, is a secondary efficacy endpoint.

¹ ADAS-Cog = *The Alzheimer’s Disease Assessment Scale – Cognitive Subscale, a measure of cognition*

² ADCS-ADL = *Alzheimer’s Disease Cooperative Study – Activities of Daily Living, a measure of health function*

³ iADRS = *integrated Alzheimer’s Disease Rating Scale, a composite measure of cognition and health function*

Special Protocol Assessments

In August 2021, we announced we had reached agreement with FDA under a Special Protocol Assessment (SPA) for both Phase 3 studies. These SPA agreements document that FDA has reviewed and agreed upon the key design features of our Phase 3 study protocols of simufilam for the treatment of patients with Alzheimer’s disease.

An SPA agreement indicates concurrence by the FDA with the adequacy and acceptability of specific critical elements of overall protocol design (e.g., entry criteria, dose selection, endpoints, etc.). These elements are critical to ensure that our planned Phase 3 studies of simufilam in Alzheimer’s disease can be considered adequate and well-controlled studies in support of a future regulatory submission and marketing application.

The first clinical study protocol under the SPA is titled “A Phase 3, Randomized, Double-Blind, Placebo-Controlled, Parallel-Group, 52-Week Study Evaluating the Safety and Efficacy of One Dose of Simufilam in Subjects with Mild-to-Moderate Alzheimer’s Disease.”

The second clinical study protocol under the SPA is titled “A Phase 3, Randomized, Double-Blind, Placebo-Controlled, Parallel-Group, 76-Week Study Evaluating the Safety and Efficacy of Two Doses of Simufilam in Subjects with Mild-to-Moderate Alzheimer’s Disease.”

Phase 3 Drug Supply

In March 2021, we announced we had entered into a drug supply agreement with Evonik Industries AG for simufilam. Under the agreement, Evonik will supply us with large-scale, clinical-grade quantities of simufilam. Evonik is one of the world’s largest contract development and manufacturing organizations for pharmaceutical ingredients. Other vendors supply excipients, the finished dosage form (i.e., simufilam tablets), drug packaging, package labeling and other critical steps in the supply chain for Phase 3 drug supply.

Phase 3 Clinical Program Overview

The Phase 3 program consists of two large, double-blind, randomized, placebo-controlled studies of simufilam in patients with mild-to-moderate Alzheimer’s disease dementia. Figure 5. In 2021, the FDA granted each study a Special Protocol Assessment (SPA). In June 2021, we announced the selection of Premier Research International as our clinical research organization (CRO) to help conduct the Phase 3 clinical program of simufilam for Alzheimer’s disease.

Figure 5.

	Enrollment Target	Simufilam Treatment	Length of Treatment	Co-Primary Endpoints		Secondary Endpoints	
				Cognition Scale	Function Scale	Cognition + Function Scale	Dementia-related Behavior Scale
RETHINK-ALZ	~ 750 Subjects	100 mg	52 Weeks	ADAS-Cog12	ADCS-ADL	iADRS	NPI ₁₂
REFOCUS-ALZ	~ 1,000 Subjects	100 mg or 50 mg	76 Weeks	ADAS-Cog12	ADCS-ADL	iADRS	NPI ₁₂

RETHINK-ALZ and REFOCUS-ALZ

On October 6, 2021, and November 18, 2021, we announced initiation of our two Phase 3 studies of simufilam, respectively.

The first Phase 3 study, called RETHINK-ALZ, is designed to evaluate the safety and efficacy of oral simufilam 100 mg in enhancing cognition and slowing cognitive and functional decline over 52 weeks. Secondary objectives include the assessment of simufilam’s effect on neuropsychiatric symptoms and caregiver burden. This randomized, double-blind, placebo-controlled study plans to enroll approximately 750 patients with mild-to-moderate Alzheimer’s disease in the U.S. and Canada and, eventually, overseas.

Details of the RETHINK-ALZ Phase 3 study include:

- Approximately 750 subjects with mild-to-moderate Alzheimer's disease to be enrolled.
- Subjects to be randomized (1:1) to simufilam 100 mg or placebo twice daily.
- Subjects to be treated for 12 months.
- The co-primary efficacy endpoints are ADAS-Cog¹, a cognitive scale, and ADCS-ADL², a functional scale; both are standard clinical tools in trials of Alzheimer's disease.
- A secondary efficacy endpoint is iADRS³, a standard clinical tool in trials of Alzheimer's disease that combines cognitive and functional scores from ADAS-Cog & ADCS-ADL.
- Other secondary endpoints include plasma biomarkers of disease and NPI⁴, a clinical tool that assesses the presence and severity of dementia-related behavior.

On November 18, 2021, we announced initiation of a second Phase 3 study, called REFOCUS-ALZ, designed to evaluate the safety and efficacy of oral simufilam 100 mg and 50 mg over 76 weeks. This randomized, double-blind, placebo-controlled study plans to enroll approximately 1,000 patients with mild-to-moderate Alzheimer's disease in the U.S. and Canada and, eventually, overseas.

Details of the REFOCUS-ALZ Phase 3 study include:

- Approximately 1,000 subjects with mild-to-moderate Alzheimer's disease to be enrolled.
- Subjects to be randomized (1:1:1) to simufilam 100 mg, 50 mg, or placebo BID.
- Subjects to be treated for 76 weeks.
- The co-primary efficacy endpoints are ADAS-Cog¹, a cognitive scale, and ADCS-ADL², a functional scale; both are widely used clinical tools in trials of Alzheimer's disease.
- A secondary efficacy endpoint is iADRS³, a widely used clinical tool in trials of Alzheimer's disease that combines cognitive and functional scores from ADAS-Cog & ADCS-ADL.
- Other secondary endpoints include CSF, plasma and imaging biomarkers of disease and NPI⁴, a clinical tool that assesses the presence and severity of dementia-related behavior.

¹ ADAS-Cog = *The Alzheimer's Disease Assessment Scale – Cognitive Subscale, a measure of cognition*

² ADCS-ADL = *Alzheimer's Disease Cooperative Study – Activities of Daily Living, a measure of health function*

³ iADRS = *integrated Alzheimer's Disease Rating Scale, a composite measure of cognition and health function*

⁴ Neuropsychiatric Inventory (NPI)

SavaDx

Our investigational product candidate, called SavaDx, is early-stage program focused on detecting the presence of Alzheimer's disease from a small sample of blood. For business, technical and personnel reasons, we continue to prioritize the development of simufilam, our novel drug candidate, over SavaDx, our novel diagnostic candidate.

The regulatory pathway for SavaDx may eventually include formal analytical validation studies and clinical studies that support evidence of sensitivity, specificity and other variables in various healthy and diseased patient populations. We have not conducted such studies and do not expect to conduct such studies in 2022.

SavaDx is currently designed as an antibody-based detection system for altered filamin A (FLNA). In 2022, we plan to evaluate a new approach to detect FLNA without the use of antibodies.

About Alzheimer's Disease

Alzheimer's disease is a progressive neurodegenerative disorder that affects cognition, function and behavior. As of 2021, there were approximately 55 million people worldwide living with dementia, a figure expected to increase to 139 million by 2050 according to outside sources. The annual global cost of dementia is now above \$1 trillion, according to Alzheimer's Disease International, a charitable organization. If this occurs, there is potential for Alzheimer's disease to cause a major financial drain on the national economy.

Our Scientific Approach is Different

Over the last ten years, we have developed a new and promising scientific approach for the treatment and diagnosis of neurodegenerative diseases, such as Alzheimer's disease. Importantly, we do not seek to clear amyloid out of the brain. Rather, we seek to stabilize a critical protein in the brain that has many downstream effects.

Our scientific approach is to treat neurodegeneration by targeting an altered form of a scaffold protein called FLNA. Through years of basic research, we and our academic collaborators identified FLNA as a structurally altered protein in the Alzheimer's brain. We have shown that the altered form of FLNA is pervasive in the Alzheimer's brain and undetectable in healthy control brains.

Using scientific insight and advanced techniques in molecular biochemistry, bioinformatics and imaging, we have elucidated this protein dysfunction. Through this work, we have produced experimental evidence that altered FLNA plays a critical role in Alzheimer's disease. We engineered a family of high-affinity, small molecules to target this structurally altered protein and restore its normal shape and function. This family of small molecules, including our lead therapeutic candidate, simufilam, was designed in-house and characterized by our academic collaborators.

Our lead therapeutic product candidate, simufilam, is a small molecule (oral) drug with a novel mechanism of action. The target of simufilam is altered FLNA, the brain protein we seek to stabilize. Importantly, since simufilam has a unique mechanism of action, we believe its potential therapeutic effects may be additive or synergistic with those of other therapeutic candidates aiming to treat neurodegeneration.

Given the biopharmaceutical industry's challenging track record in Alzheimer's research, we believe there is an urgent need to consider more recent and innovative approaches to combat this disease. We believe our scientific approach may broaden the range of possible treatment approaches for this complex disease.

Our science is based on stabilizing a critical protein in the brain

Proteins are essential for cell function because they participate in virtually every biological process. If protein function is impaired, the health consequences can be devastating. Technological advances in medicine and improvements in lifestyle are making our lives longer. But with age, genetic mutations and other factors conspire against healthy cells, resulting in altered proteins. Sometimes a cell can rid itself of altered proteins. However, when disease changes the shape and function of critical proteins, multiple downstream processes are impaired. There are many clinical conditions in which proteins become structurally altered and impair the normal function of cells, tissues and organs, leading to disease. Conversely, restoring altered proteins back to health –called proteostasis – is a well-accepted therapeutic strategy in clinical medicine.

For over 100 years, scientists have ascribed various neurodegenerative diseases to proteins that misfold and are rendered pathological. In Alzheimer's disease, certain proteins, such as amyloid and tau, lose their normal shape and function. Such misfolded proteins can breakdown or aggregate in clumps and form plaque or tangles in the brain. Destruction of neuronal synapses, accelerated nerve cell death, and dysfunction of the brain support cells, are all widely believed to be direct consequences of misfolded proteins.

FLNA is a scaffolding protein found in high levels in the brain. A healthy scaffolding protein brings multiple proteins together, coordinating their interaction. However, an altered form of FLNA protein is found in the Alzheimer's brain. Our experimental evidence shows that altered FLNA protein contributes to Alzheimer's disease by disrupting the normal function of neurons, leading to neurodegeneration and brain inflammation. Our product candidate, simufilam, aims to counter the altered and toxic form of FLNA in the brain, thus restoring the normal function of this critical protein. Our novel science is based on stabilizing – but not removing – a critical protein in the brain.

One drug, multiple effects

Our lead therapeutic candidate, simufilam, binds to altered FLNA with very high (femtomolar) affinity. This drug effect restores the normal shape of FLNA and the normal function of key brain receptors, including: the alpha-7 nicotinic acetylcholine receptor; the N-methyl-D-aspartate (NMDA) receptor; and the insulin receptor. These receptors have pivotal roles in brain cell survival, cognition and memory.

In animal models, treatment with simufilam resulted in dramatic improvements in brain health, such as reduced amyloid and tau deposits, improved receptor signaling and improved learning and memory. In addition, simufilam has another beneficial treatment effect of significantly reducing inflammatory cytokines in the brain. In animal models of disease, treatment with simufilam greatly reduced levels of IL-6 and suppressed TNF-alpha and IL-1beta levels by 86% and 80%, respectively, illustrating a powerful anti-neuroinflammatory effect.

By restoring function to multiple receptors and exerting powerful anti-inflammatory effects, we believe our approach has potential to slow the progression of neurodegeneration in patients. Thus, we have designed simufilam to slow or, potentially, even reverse the deterioration of brain cells.

Our science is published in multiple peer-reviewed journals. In addition, our research has been supported by NIH under multiple research grant awards. Each grant was awarded following an in-depth, peer-reviewed evaluation of our approach for scientific and technical merit by a panel of outside experts in the field. Strong, long-term support from NIH has allowed us to advance our two product candidates for neurodegeneration, simufilam and SavaDx, into clinical development.

Currently marketed drug therapies for Alzheimer's disease have limited therapeutic effect

There are currently no disease-modifying drug therapies to treat Alzheimer's disease. The FDA has not approved any new drugs for Alzheimer's disease since 2003, except, however, in June 2021, aducanumab received marketing approval from FDA for the treatment of Alzheimer's disease using the accelerated approval pathway "based on the drug's effect on a surrogate endpoint that is reasonably likely to predict a clinical benefit to patients, with a required post-approval trial to verify that the drug provides the expected clinical benefit."¹ Aducanumab has been beset by controversy about whether the drug is effective in patients. Aducanumab is a proprietary drug of Biogen, Inc., a large biopharmaceutical company.

¹ See: FDA Grants Accelerated Approval for Alzheimer's Drug, June 07, 2021, <https://www.fda.gov/news-events/press-announcements/fda-grants-accelerated-approval-alzheimers-drug>

Currently marketed drug therapies focus solely on treating symptoms, mostly in patients with mild-to-moderate Alzheimer's disease. At the time of diagnosis, patients are initiated on a class of drugs called cholinesterase inhibitors. The Alzheimer's brain has low levels of a neurotransmitter called acetylcholine. Cholinesterase inhibitors prevent an enzyme in the brain, called acetylcholinesterase, from breaking down acetylcholine. Currently marketed cholinesterase inhibitors include donepezil (marketed by Eisai Co., Ltd. and Pfizer, Inc. as Aricept[®]), rivastigmine (marketed by Novartis AG as Exelon[®]) and galantamine (marketed by Janssen Pharmaceuticals, Inc. as Razadyne[®]). Cholinesterase inhibitors may benefit some patients for several months, after which the targeted brain receptors are desensitized, and drug efficacy is lost. To our knowledge, no drug for Alzheimer's has shown an ability to stabilize cognition in patients, much less improve cognition, beyond a few months.

Simufilam is our Proprietary Drug Candidate for the Treatment of Alzheimer's Disease.

We have generated and published experimental evidence of improved brain health by restoring altered FLNA with simufilam, our lead therapeutic product candidate. Simufilam is a proprietary small molecule (oral) drug that represents an entirely new scientific approach to treat neurodegeneration. Published studies have demonstrated that simufilam targets an altered form of a protein called FLNA that is pervasive in the Alzheimer's brain. Altered FLNA causes neuronal dysfunction, neuronal degeneration and neuroinflammation. We believe our lead drug candidate, simufilam, improves brain health by reverting altered FLNA back to its native, healthy conformation, thus countering downstream toxic effects of altered FLNA. Importantly, simufilam is not dependent on clearing amyloid from the brain. The following is additional detail on simufilam's drug development program.

IND submission to FDA

Over the past ten years, we successfully conducted basic research, in vitro studies and preclinical studies in support of an Investigational New Drug (IND) submission to FDA for simufilam, including requisite studies around safety pharmacology, toxicology, genotoxicity and bioanalytical methods. In 2017 we filed an IND with FDA for simufilam.

Clinical safety of simufilam in a Phase 1 study

Following FDA acceptance of our IND in 2017, we investigated the safety, dosing and pharmacokinetic profile of simufilam in healthy human volunteers. The design of our first-in-human Phase 1 study was based on regulatory feedback, clinical and scientific rationale and observations from previously conducted preclinical and in vitro studies.

In a Phase 1 study, simufilam was evaluated in 24 healthy human volunteers in a single site in the U.S. for safety, tolerability and pharmacokinetics. Study subjects were administered a single oral dose of 50, 100 or 200 mg of simufilam. Drug was well-tolerated in all subjects. Importantly, simufilam showed no treatment-related adverse effects and no dose-limiting safety findings. Pharmacokinetic measurements demonstrated that simufilam, a small molecule, was rapidly absorbed. Dose-proportionality was observed over the full dose range of 50 to 200 mg.

Given the absence of any observable dose-limiting effects in healthy adults in a Phase 1 study, a strong scientific rationale, and multiple peer-reviewed publications and research grant awards, we believe this program demonstrated favorable proof-of-principle for the development of simufilam in Alzheimer's disease.

Phase 2a Clinical Study

In 2019, we completed a first-in-patient, clinical proof-of-concept study of simufilam in the U.S. Our Phase 2a was an open-label, multi-center, safety and pharmacokinetic study of simufilam. Thirteen (13) patients with mild-to-moderate Alzheimer's disease, age 50-85, received 100 mg oral simufilam twice daily for 28 days. A diagnosis of Alzheimer's disease was confirmed with Mini-Mental State Examination (MMSE) ≥ 16 and ≤ 24 and a cerebrospinal fluid (CSF) T-tau/ $A\beta_{42}$ ratio ≥ 0.30 . Safety was assessed by ECGs, clinical labs, adverse event monitoring and physical examinations. CSF was drawn from patients before dosing started and again after 28 continuous days of dosing with simufilam. CSF samples were then analyzed for biomarkers of Alzheimer's pathology (T-tau, P-tau, $A\beta_{42}$); neurodegeneration (NfL, neurogranin); and neuroinflammation (YKL-40, IL-6, IL-1 β and TNF α). A consulting biostatistician conducted an independent analysis of the data set.

A key objective of our Phase 2a study was to measure levels of CSF biomarkers in the brain. Key results of this study include (Figure 6):

- Total tau (T-tau) decreased 20% ($p < 0.001$)
- Phosphorylated tau (P-tau) decreased 34% ($p < 0.0001$)
- Neurofilament light chain (NfL), a marker for neurodegeneration, decreased 22% ($p < 0.0001$)
- Neurogranin, a marker for cognitive decline, decreased 32% ($p < 0.0001$)
- Neuroinflammatory marker YKL-40, an indicator of microglial activation, decreased 9% ($p < 0.0001$)
- Proinflammatory Interleukin 6 (IL-6) decreased 14% ($p < 0.0001$)
- Proinflammatory Interleukin 1 beta (IL-1 β) decreased 11% ($p < 0.0001$)
- Proinflammatory Tumor Necrosis Factor alpha (TNF α) decreased 5% ($p < 0.001$)
- The ratio of CSF P-tau to A β_{42} , a widely accepted biochemical value of Alzheimer’s disease, improved in all patients ($p < 0.001$)

Figure 6: Simufilam treatment reduces levels of CSF biomarkers in patients with Alzheimer’s in a Phase 2a study.

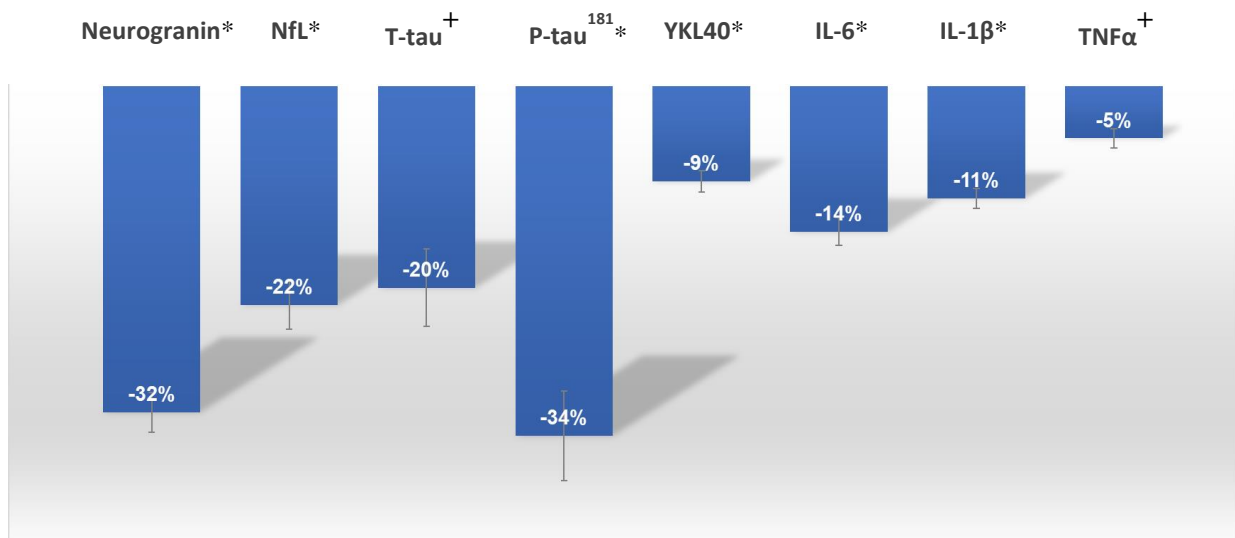


Figure 6. Percent change from baseline in CSF biomarkers measured by ELISA. Eight CSF biomarkers of disease in Alzheimer’s patients were significantly reduced with simufilam treatment. * $p < 0.0001$, + $p < 0.001$ in paired t test comparing Day 28 to pre-dose baseline.

Consistent with over 10 years of basic research and preclinical data, we believe our Phase 2a study showed clinical evidence of simufilam's mechanism of action and drug-target engagement, including:

- Improvements in biomarkers of Alzheimer's disease in CSF, plasma and lymphocytes;
- Consistency across biomarker improvements in CSF, plasma, and lymphocytes;
- Significant reductions ($p < 0.01$) in both nitrated and phosphorylated forms of tau protein;
- Evidence that each individual patient showed biomarker responses to simufilam;
- Evidence that simufilam reversed the shape of altered filamin A in lymphocytes;
- Evidence that simufilam reduced levels of amyloid bound to alpha 7 nicotinic receptors in lymphocytes;
- Early clinical validation of the drug target – altered filamin A – as a facilitator protein between amyloid beta and both neuroinflammation and tau pathology.

Cognition and function were not assessed in this small Phase 2a study. However, independent research has shown that high levels of CSF biomarkers of P-tau and total tau/ $A\beta_{42}$ ratio correlate with worse performance on a wide range of memory and attention tests. Conversely, we believe lowering a panel of CSF biomarkers of disease may benefit patients.

Phase 2b Clinical Study

In March 2020, we announced the completion of a double-blind, randomized, placebo-controlled, multi-center clinical study of simufilam. Sixty-four patients with mild-to-moderate Alzheimer's disease, age 50-85, were randomized (1:1:1) to 100 mg or 50 mg oral simufilam or matching placebo. Treatment was administered twice daily for 28 days. Nine U.S. study sites enrolled patients. A clinical diagnosis was confirmed with the MMSE ≥ 16 and ≤ 26 and a CSF T-tau/ $A\beta_{42}$ ratio ≥ 0.28 . Safety was assessed by ECGs, clinical labs, adverse event monitoring and physical examinations. This study was substantially funded by a research grant award from NIH.

The Phase 2b clinical study was designed to evaluate safety, tolerability and drug effects of simufilam on biomarkers of Alzheimer's disease. The primary endpoint was improvement in biomarkers of Alzheimer's disease from baseline to Day 28. CSF was drawn from patients before dosing started and again after 28 continuous days of dosing with simufilam. CSF samples were then analyzed for biomarkers of Alzheimer's pathology (T-tau, P-tau, $A\beta_{42}$); neurodegeneration (NfL, neurogranin); and neuroinflammation (YKL-40, IL-6, sTREM2, HMGB1) and BBB integrity (IgG, albumin). A consulting biostatistician conducted an independent analysis of the data set.

In May 2020, we announced that an outside lab with whom we had no prior work experience conducted a bioanalysis of CSF samples from our Phase 2b study. The data set from this initial bioanalysis showed unnaturally high variability and other problems. Overall, we believe data from the initial bioanalysis can be interpreted as anomalous and highly improbable. With its validity in question, we believe the initial bioanalysis serves no useful purpose. Backup CSF samples were subsequently sent to City University of New York (CUNY) for bioanalysis. All bioanalyses were conducted under blinded conditions to eliminate any possibility of bias.

In September 2020, we reported final positive Phase 2b clinical study results. Drug was safe and well-tolerated in this study. Simufilam significantly ($P < 0.05$) improved an entire panel of biomarkers of disease in patients with Alzheimer's disease compared to a placebo group. In addition, Alzheimer's patients treated with simufilam showed directional improvements in validated tests of episodic memory and spatial working memory, versus patients on placebo. Cognitive improvements correlated most strongly ($R = 0.5$) with decreases in levels of P-tau181 in CSF. The study achieved a 98% response rate, defined as the proportion of study participants taking simufilam who showed improvements in biomarkers. Importantly, we believe these data are consistent with prior clinical and preclinical results, the drug's mechanism of action and over 10 years of basic research.

To our knowledge, no drug candidate has demonstrated the ability to reduce an entire panel of biomarkers of disease in patients with Alzheimer's disease. For this reason, clinical data generated in our Phase 2a and Phase 2b studies may not be directly comparable to results generated by our competitors.

Key biomarker results include the following (all p-values versus placebo) (Figure 7):

- Core markers of Alzheimer’s pathology are total tau (T-tau), phosphorylated tau (P-tau181), and amyloid beta42 (A β ₄₂). In Alzheimer’s, tau and P-tau levels are elevated and A β ₄₂ is low.
 - T-tau decreased 15% (p<0.01) for patients in the 50 mg drug group.
 - T-tau decreased 18% (p<0.01) for patients in the 100 mg drug group.
 - P-tau decreased 8% (p<0.01) for patients in the 50 mg drug group.
 - P-tau decreased 11% (p<0.01) for patients in the 100 mg drug group.
 - A β ₄₂ increased 17% (p<0.01) for patients in the 50 mg drug group.
 - A β ₄₂ increased 14% (p<0.01) for patients in the 100 mg drug group.
- Elevated CSF levels of two proteins, Neurogranin (Ng) and Neurofilament Light Chain (NfL) indicate neurodegeneration.
 - Ng decreased 36% (p<0.01) for patients in the 50 mg drug group.
 - Ng decreased 43% (p<0.01) for patients in the 100 mg drug group.
 - NfL decreased 28% (p<0.05) for patients in the 50 mg drug group.
 - NfL decreased 34% (p<0.01) for patients in the 100 mg drug group.
- Proinflammatory IL-6 (Interleukin 6) is produced in response to tissue stress and injury.
 - IL-6 decreased 10% (p<0.01) for patients in the 50 mg drug group.
 - IL-6 decreased 11% (p<0.01) for patients in the 100 mg drug group.
- Elevated levels of neuroinflammatory marker YKL-40 indicate microglial activation.
 - YKL-40 decreased 10% (p<0.01) for patients in the 50 mg drug group.
 - YKL-40 decreased 12% (p<0.01) for patients in the 100 mg drug group.
- sTREM2 is a neuroinflammation biomarker that has commanded substantial recent attention from researchers for its role in Alzheimer’s disease and frontotemporal dementia.
 - sTREM2 decreased 43% (p<0.01) for patients in the 50 mg drug group.
 - sTREM2 decreased 46% (P<0.01) for patients in the 100 mg drug group.
- Simufilam Significantly Reduced Levels of HMGB1 in CSF.
 - HMGB1 decreased 33% (p<0.01) in patients treated with 50 mg simufilam
 - HMGB1 decreased 32% (p<0.01) in patients treated with 100 mg simufilam
- Simufilam Significantly Improved the Integrity of the Blood-brain Barrier (BBB).
 - CSF IgG decreased 30% (p<0.05) in patients treated with 50 mg simufilam
 - CSF IgG decreased 30% (p<0.05) in patients treated with 100 mg simufilam
 - CSF albumin decreased 15% (p<0.05) in patients treated with 50 mg simufilam
 - CSF albumin decreased 28% (p<0.05) in patients treated with 100 mg simufilam
- Simufilam Improved the Albumin Ratio, a Test of Blood-brain Barrier (BBB) Permeability:
 - BBB permeability can be clinically evaluated by comparing levels of albumin in CSF and plasma. The albumin ratio is a test for BBB permeability because albumin protein is not synthesized in CSF. Hence, albumin in CSF necessarily comes from plasma through the BBB. The albumin ratio is frequently elevated in patients with dementia and various other disorders.
 - In the Phase 2b study, the albumin ratio was unchanged for Alzheimer’s patients on placebo. The albumin ratio improved by approximately 5 and 7 points for patients treated with simufilam, 50 mg and 100 mg, respectively, over 28 days.

Changes in the Albumin Ratio by Treatment Group

Treatment	Day 0	Day 28	Change-Day 0 to 28
Placebo	24	24	No change
50 mg simufilam	25	20	- 20%
100 mg simufilam	25	18	- 28%

Figure 7. Simufilam improved levels of CSF biomarkers in patients with Alzheimer’s in a Phase 2b study.

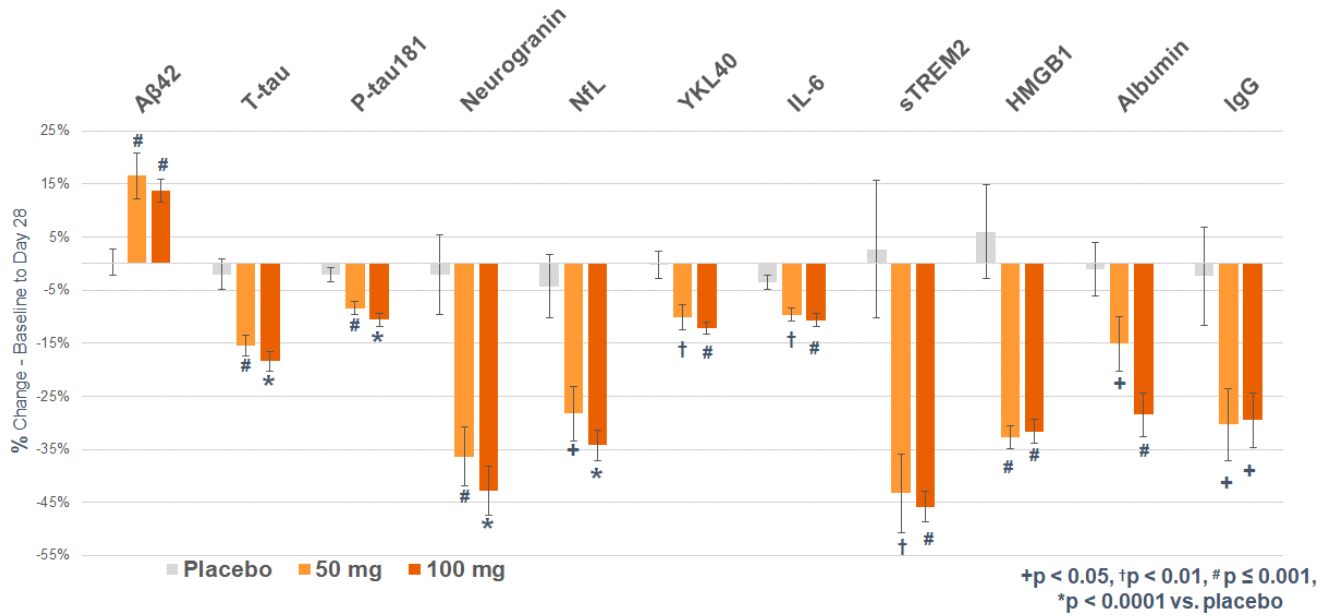
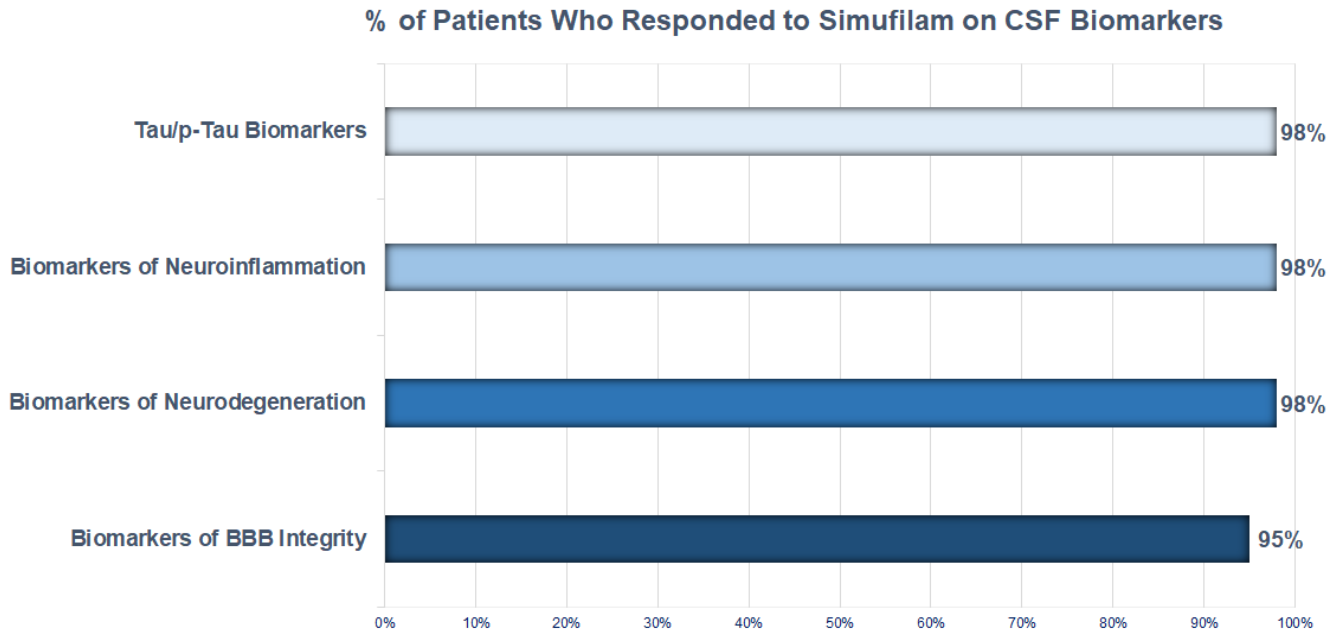


Figure 8. Study response rate, defined as the proportion of study participants taking simufilam who showed improvements in biomarkers.

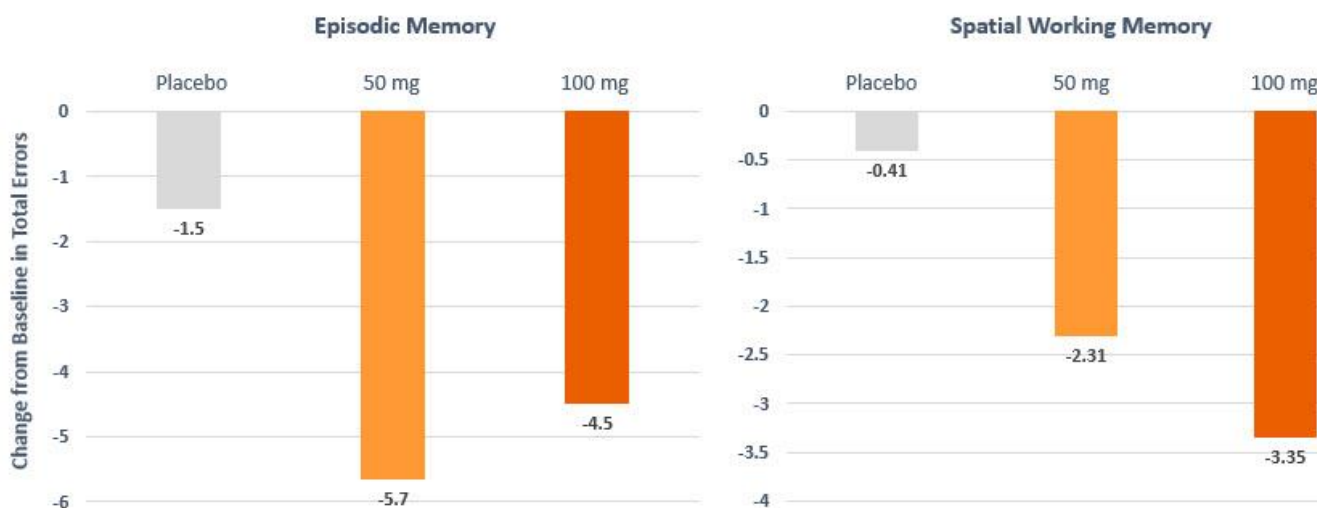


A further objective of this study was to measure drug effects on cognition. Patients were tested at baseline and again on Day 28. Changes in episodic memory and spatial working memory were assessed on CANTAB, a validated, computer-based battery of tests. CANTAB is designed to measure cognitive skills regardless of the subject’s language skills, speed, gender or education.

Only directional trends are observed in memory improvements, due to limitations around study size (N=64). The final data analysis shown in Figure 9 excludes three patients who we subsequently learned showed no detectable level of simufilam in plasma and two patients who missed 25% or more of their doses by pill counts. In addition, outlier subjects with the most and fewest errors (by baseline score cutoffs) were removed from the final analysis of episodic memory (Figure 9):

- Alzheimer’s patients in both drug groups showed directional improvements on tests of episodic memory and spatial memory after 28 days of treatment, versus patients on placebo.
- Episodic memory improved by -5.7 (lower score is better) for Alzheimer’s patients in the 50 mg drug group, versus -1.5 for patients on placebo.
- Episodic memory improved by -4.5 (lower score is better) for Alzheimer’s patients in the 100 mg drug group, versus -1.5 for patients on placebo.
- Spatial memory improved by -2.31 (lower score is better) for Alzheimer’s patients in the 50 mg drug group, versus -0.4 for patients on placebo.
- Spatial memory improved by -3.35 (lower score is better) for Alzheimer’s patients in the 100 mg drug group, versus -0.4 for patients on placebo.
- Improvements in cognition correlated most strongly (statistical R=0.5) with decreases in CSF P-tau181, a biomarker that, when elevated, leads to tangles in the brain. Simufilam decreased brain levels of Ptau-181 by 8-11%, versus placebo.

Figure 9. Episodic Memory and Spatial Working Memory Improvements



SavaDx

Our investigational diagnostic product candidate, called SavaDx, is early-stage program focused on detecting the presence of Alzheimer’s disease from a small sample of blood based. For business, technical and personnel reasons, we continue to prioritize the development of simufilam, our novel drug candidate, over SavaDx, our novel diagnostic candidate.

The regulatory pathway for SavaDx may eventually include formal analytical validation studies and clinical studies that support evidence of sensitivity, specificity and other variables in various healthy and diseased patient populations. We have not conducted such studies and do not expect to conduct such studies in 2022.

SavaDx is currently designed as an antibody-based detection system for altered filamin A (FLNA). In 2022, we plan to evaluate a new approach to detect FLNA without the use of antibodies.

Over the past ten years, we discovered that altered FLNA is a hallmark feature of brain pathology in patients with Alzheimer's disease. We believe SavaDx may reveal early traces of the disease, potentially even before the overt appearance of disease symptoms, such as memory loss.

A diagnostic test usually measures one or more biomarkers, which are biological indicators of disease. A deep understanding of the biology of disease is required to identify and develop a diagnostic. A valid diagnostic has certain baseline characteristics to be functional and useful for clinical practice. It must detect disease in patients and, conversely, not detect disease in healthy subjects; and it is preferably quantitative, giving some indication of severity or stage of disease. Collectively, the ability to selectively detect disease indicators can be useful to provide diagnostic information (i.e., detect the disease) or prognostic information (i.e., predict the disease or its future course).

Currently, the most definitive method to diagnose Alzheimer's disease is through autopsy after death, which is not particularly helpful. Methods to detect Alzheimer's disease during its course can be expensive, invasive, subjective, risky or uncomfortable. Importantly, because of the expense and invasiveness of current tests, most people are not tested until they show obvious cognitive decline.

Current approaches for diagnosing Alzheimer's disease include measurement of amyloid- β (specifically, A β ₄₂), total tau (T-tau) or phosphorylated tau (P-tau) levels in CSF or plasma; structural neuroimaging techniques, including magnetic resonance imaging (MRI) or computerized tomography (CT); positron-emission tomography (PET) imaging of brain amyloid (AmyVid[®]); and batteries of cognitive tests. Usually, a combination of more than one test is necessary to provide a working diagnosis. When such tests and techniques are used together, the totality of data can be sensitive and specific for the detection of Alzheimer's disease. In practice, however, such tests and techniques are only used after overt symptoms of impaired memory.

We believe there is a profound need for a blood-based diagnostic test for Alzheimer's disease. A quick, simple, inexpensive test may benefit the medical community in many ways. Advantages may include confirming the presence of Alzheimer's disease earlier, when lifestyle changes and potential therapeutics may have the most impact, or conversely, to rule out Alzheimer's disease at such early stages. Other potential benefits include discriminating Alzheimer's disease from other causes of dementias; helping to identify stage of Alzheimer's disease; selection and enrollment of appropriate patients into clinical studies of experimental product candidates; and better alignment of a patient's specific diagnosis with a targeted therapeutic.

It is widely accepted that in Alzheimer's disease, pathological changes in the brain occur at least 10-15 years before clinical symptoms appear. These "pre-symptomatic" changes include deposits of certain misfolded or impaired proteins in the brain. Our long-term goal with SavaDx is to identify people with Alzheimer's disease, potentially long before clinical symptoms occur. Early detection may be critical for any intervention to cease - or at least slow down - brain damage before it is too late. Importantly, a non-invasive screen for latent Alzheimer's disease prior to overt symptoms could be conducted as a general health screen, not just in patients at risk by family history or in patients already showing cognitive impairment. Once a disease-modifying treatment is found, early detection is likely to be critically important. Early detection and treatment may also be critical in identifying such a disease-modifying treatment, as many believe one reason for clinical study failures in Alzheimer's disease is that treatment has routinely started too late in the course of disease to make any impact.

Moreover, with repeat measurements over time, SavaDx may provide a probability of cognitive decline or disease progression. Even if SavaDx does not provide a precise numerical cutoff value for Alzheimer's disease, we believe it may be important to incorporate data from SavaDx into the overall diagnostic framework for neurodegeneration, and Alzheimer's disease in particular. As with any diagnosis of disease, some people may embrace a way to detect Alzheimer's disease long before clinical symptoms appear, while others may prefer not to know – at least until a treatment is found.

Diagnostic development program.

Diagnostic development differs from drug development in many important ways. As a result, diagnostic development requires substantial differences in planning, study design and study execution.

Some of the ways that diagnostic development differs from drug development include the following:

- We may need to choose among a wider range of regulatory pathways for approval of SavaDx, depending on factors such as intended use and user, test type and complexity and role in patient-care decisions;
- Drug studies usually deal primarily with one office within FDA, but the regulatory pathway for SavaDx may require us to consider the policies of multiple federal or state regulatory agencies and offices;
- Unlike drug programs, statistical analysis with SavaDx does not focus on efficacy and safety endpoints. Rather, study endpoints for SavaDx will focus on sensitivity (true positives), specificity (true negatives), positive predictive value (percentage of correct positive diagnoses of known positive cases) and negative predictive value (percentage of correct negative diagnoses of known negative cases).

SavaDx is an investigational diagnostic product candidate that has not yet been reviewed by FDA. Clinical testing consists of collecting blood samples on a limited scale to test and validate SavaDx using antibodies. Our ability to test such samples depends on multiple factors, many of which are beyond our control. For example, optimal sample collection depends on risk of sample degradation, storage requirements to preserve samples, cost of sample storage and actual vs. predicted time of assay validation.

Over the past five years, we have conducted early validation tests using SavaDx. In three blinded studies of test samples, SavaDx detected more than a 10-fold separation between Alzheimer's patients and normal healthy control subjects (N=232 test samples). In these three proof-of-concept studies, SavaDx demonstrated nearly 100% accuracy and specificity. The three studies deployed a research grade antibody manufactured by an outside vendor.

A fourth blinded study of SavaDx failed to generate meaningful diagnostic data. We believe the fourth study deployed a faulty research antibody sourced from an outside vendor. Commercially available research antibodies can present certain technical flaws, such as improper validation, significant batch-to-batch variations or inconsistent storage, any of which can jeopardize results of studies and experiments. For these reasons, and in order to increase consistency of quality, reliability and availability, we have attempted to develop and validate a proprietary, fit-for-purpose, monoclonal antibody system for use with SavaDx. This effort remains a work-in-progress.

In July 2021, we announced positive clinical data with SavaDx when used to measure plasma levels of altered filamin A before and after simufilam treatment in patients with Alzheimer's disease. In a Phase 2b randomized, controlled trial sponsored by the National Institutes of Health (NIH), simufilam significantly reduced plasma levels of altered filamin A in Alzheimer's patients treated for 28 days. Plasma levels of p-tau181 also dropped significantly in these same patients.

The legal system for intellectual property around diagnostic methods is highly complex and uncertain. In the U.S., patent courts have struggled to define a clear means of patent eligibility for modern age diagnostics. Generally, a simple process involving correlations between blood test results and patient health is not eligible for patent claims because such processes incorporate "laws of nature". However, different outcomes from different courts, including Federal Circuit, district court and Patent Trial and Appeal Board decisions, have continued to create a sometimes vague or conflicting legal framework for determining the eligibility of patent claims for diagnostic methods. As a result, we cannot be certain how SavaDx fits into the current U.S. legal framework for obtaining effective patent claims. Furthermore, claims for diagnostic methods can be complicated to enforce.

We currently have no issued patents in the United States with respect to SavaDx, which we believe may be protected in the United States by trade secrets, know-how and other proprietary rights technology.

Expansion of our science to other indications.

It is well-known that protein misfolds occur in a wide variety of biological processes and diseases. We may leverage our scientific insights in neurodegeneration and advanced tools in biochemistry, bioinformatics and imaging to expand our science

to other diseases. New indications and new drug development approaches may complement our initial focus on Alzheimer's disease.

Preclinical programs are always visionary, sometimes innovative and often of high biomedical potential. However, by definition such programs are exploratory and risky. Moreover, most preclinical programs fail for scientific or other reasons, regardless of the amount of effort or resources that are brought to bear upon such programs. For these reasons, in general we do not intend to disclose our preclinical programs until such time as they become material to our pipeline of product candidates.

We own worldwide rights to our neurodegeneration program.

We own intellectual property, including patents, patent applications, technology, trade secrets and know-how in the U.S. and other countries. The protection of patents, designs, trademarks and other proprietary rights that we own or license is critical to our success and competitive position. We consider the overall protection of our patents and other intellectual property rights to be of material value and act to protect these rights from infringement.

We seek to protect our technology by, among other methods, filing and prosecuting U.S. and foreign patents and patent applications with respect to our technology and products and their uses. The focus of our patent strategy is to secure and maintain intellectual property rights to technology for our program in neurodegeneration.

Simufilam and SavaDx were both discovered and designed in-house and were characterized by our academic collaborators during research activities that were conducted from approximately 2008 to date. We own exclusive, worldwide rights to these drug assets and related technologies, without royalty obligations to any third party. Our patent protection with respect to simufilam and use of simufilam for Alzheimer's disease and other neurodegenerative disease currently runs through 2033 and includes six issued patents and related patent filings and applications. In addition, we have patent protection with respect to simufilam for use in treating certain cancers that runs through 2034. We currently have no issued patents in the United States with respect to SavaDx, which we believe may be protected in the United States by trade secrets, know-how and other proprietary rights technology.

Our Development Team

Our product development team is led by seasoned professionals with a proven track record of innovation in drug discovery and development, as well as substantial business expertise.

Our Founder and Chief Executive Officer, Remi Barbier, has over 25 years of biopharmaceutical industry experience and has led teams responsible for pioneering several pharmaceutical innovations, including abuse-deterrent drugs; the clinical development of multiple pain drugs; an innovative antibody program in cancer; and other programs in neuroscience and other therapeutics areas. Before founding Cassava Sciences, he held leadership roles and was founder or co-founder of four life science companies, three of which are now publicly traded or acquired.

Our Chief Medical Officer, Nadav Friedmann PhD, MD, has eight prior FDA drug approvals and previously served as CEO of Daiichi Pharmaceuticals USA and Head of Johnson & Johnson's Biotechnology Research Center.

Our Chief Clinical Development Officer, James Kupiec, MD, has two prior FDA drug approvals and previously served as VP, Global Clinical Leader for Parkinson's Disease and Clinical Head of the Neuroscience Research Unit for Pfizer, Inc. and also held leadership roles at Sanofi and Ciba-Geigy Pharmaceuticals.

Lindsay Burns, PhD, SVP, Neuroscience, worked on the development of several product candidates in neuroscience and other therapeutics areas while at Neurex (acquired by Elan Pharmaceuticals) and Abgenix (acquired by Amgen).

Michael Zamloot, SVP of Technology Operations, has four prior FDA drug approvals and has worked in drug operations and supply chain management at Boehringer Mannheim (acquired by Roche Diagnostics), Athena Neuroscience (acquired by Elan Pharmaceuticals) and Ciba-Geigy (acquired by Novartis).

Michael Marsman, PharmD, SVP of Regulatory Affairs previously held senior positions at Impax Laboratories, Millennium Pharmaceuticals, and Syntex, where he had shared responsibility for the regulatory approval of several high-profile drugs. He also previously led regulatory affairs for our Company for nearly a decade until 2019.

George (Ben) Thornton, PhD, SVP of Technology, has led research and development teams at Johnson & Johnson as well as translated basic science to the clinical setting at biotechnology start-ups such as GeneMedicine and Apovia.

Our management team is further supported by scientific advisors who are leading experts in the field and share our commitment to advancing new treatments for neurodegenerative diseases, including Alzheimer's disease.

Our Strategy

Our goal is to develop product candidates to diagnose and treat neurodegeneration, such as Alzheimer's disease. Key elements of our business strategy to achieve this mission include:

- building a lean company that is narrowly focused on developing innovative product candidates for Alzheimer's disease and other areas of neurodegeneration;
- validating our unique scientific approach with competitive research grants and publishing our scientific data in peer-reviewed journals;
- applying our development capabilities to advance our product candidates through clinical proof-of-concept studies and beyond;
- using our expertise and experience to continue to focus on discovering new indications and product candidates, validated by experimental evidence and leading experts in the field; and
- continuing to outsource preclinical studies, clinical studies and formulation development activities in order to allow more efficient deployment of our resources

We also conduct basic research and development in collaboration with academic and other partners. Our research and development expenses were \$24.8 million and \$3.1 million for the year ended December 31, 2021 and 2020, respectively. These amounts are net of significant reimbursement received from NIH. See "*Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations*" for additional details regarding our research and development activities.

Competition

The drug discovery and development industry is characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. We face potential competition from many different sources, including pharmaceutical and biotechnology companies, academic institutions and governmental agencies and public and private research institutions. Any product candidates that we successfully develop and commercialize, such as simufilam or SavaDx, may compete with existing therapies and new therapies that may become available in the future.

Historically, the drug industry has attempted to treat Alzheimer's disease by developing drugs that block the synthesis of, or remove or dis-aggregate, beta amyloid and, more recently, another protein in the brain called tau. Essentially, the prevailing doctrine says amyloid (or tau) must be cleared out of the brain. This scientific approach – known as the amyloid hypothesis - has been repeatedly tested by our competitors in late-stage clinical studies using a variety of antibody backbones, epitopes, target conformations, biomarkers and in various stages of disease. While this approach may yet work, to date the amyloid hypothesis has failed to generate unambiguous therapeutic benefit in patients with Alzheimer's disease. More recent competitors in Alzheimer's research are focused on modulating proteins in the brain that have anti-inflammatory or other properties, an approach known as immunotherapy.

In contrast, our scientific approach seeks to simultaneously improve neurodegeneration and neuroinflammation. We believe improving multiple vital functions in the brain represents a new, different and crucial approach to address Alzheimer's disease.

Regardless of scientific approach, improvements in cognition and function remains a key criterion for FDA approval of a new drug in Alzheimer's disease, a hurdle which, to date, no drug candidate has met with clear and compelling clinical data in nearly two decades.

Our competitors may have significantly greater financial resources, an established presence in the market, expertise in research and development, manufacturing, preclinical and clinical testing, obtaining regulatory approvals and reimbursement and marketing-approved products. These competitors also compete with us in recruiting and retaining qualified scientific and

technical personnel, establishing clinical study sites and patient registration for clinical studies, as well as in acquiring or developing technologies complementary to, or necessary for, our programs. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

The key competitive factors affecting the success of simufilam, and any other product candidates that we develop to address neurodegenerative disorders, if approved, are likely to be their efficacy, safety, convenience, price, the level of generic competition, patient and physician acceptance and the availability of reimbursement from government and other third-party payors. Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop.

Our competitors also may obtain FDA approval for their products more rapidly than we may obtain approval for ours. For example, in June 2021, Biogen, Inc., a large biopharmaceutical company, received FDA approval for aducanumab (human monoclonal antibody) for the treatment of Alzheimer's disease using an accelerated approval pathway. Aducanumab's safety and efficacy profile is complex and subject to debate. Since its approval in 2021, aducanumab has had modest clinical utilization due to its high cost, lack of widespread reimbursement and other reasons. We are also aware that Eli Lilly, a large biopharmaceutical company, has announced that in 2022 it plans to petition the FDA for accelerated approval of donanemab, its monoclonal antibody drug candidate for the proposed treatment of Alzheimer's disease.

In recent years, we have observed ramped-up worldwide efforts aimed at developing blood-based techniques to detect and monitor Alzheimer's disease. The key competitive factors affecting the success of SavaDx, and any other product candidates that we develop to diagnose neurodegeneration, if approved, are likely to be their measure of accuracy, such as specificity and sensitivity, as well as their convenience, patient acceptance, price and the availability of reimbursement from government and other third-party payors. Our competitors in the diagnostic area are pharmaceutical and biotechnology companies, academic institutions and governmental agencies and public and private research institutions. Despite increased research effort, the field has generally been hampered by lack of reproducibility and an unclear path on how to move academic discoveries into clinical utilization.

In addition to blood-based techniques to detect Alzheimer's disease, competitors are examining the use of novel tracing agents and imaging techniques to map the course of neurodegeneration. In 2012, FDA approved Amyvid® (Eli Lilly Pharmaceuticals), which is a radioactive diagnostic agent for brain imaging of amyloid plaque. Amyvid can rule out Alzheimer's disease but does not confirm its presence. That is, a negative scan means little or no plaque is present; however, a positive scan does not necessarily indicate Alzheimer's disease. In addition, Amyvid cannot be used to stage Alzheimer's disease because some people take years to show cognitive decline after amyloid plaque develops, while other others rapidly develop advanced Alzheimer's disease within months. Since its approval in 2012, Amyvid has had modest clinical utilization due to its high cost, lack of widespread reimbursement and need for specialized training.

Manufacturing

We do not own or lease any manufacturing facilities. We outsource formulation, manufacturing and related activities to third parties. For the foreseeable future, we will continue to rely on third parties to conduct certain quality control and assurance testing, shipping or storage of our product candidates.

We currently rely on one non affiliated contract development and manufacturing organization (CDMO) to manufacture simufilam and expect to continue to do so.

We believe our manufacturing strategy is on-track to ensure sufficient drug supply for a Phase 3 program, including both drug substance (i.e., active ingredient) and drug product (i.e., oral tablets). In March 2021, we entered into an agreement with Evonik Corporation to supply large-scale, clinical-grade quantities of drug substance for simufilam. The goal is to ensure the integrity of the drug supply chain on a worldwide basis, in compliance with FDA standards.

We believe raw materials for our drug product are readily available from reliable sources. To date, we have experienced minimal drug supply chain disruption due to COVID-19 but this may change at any time.

Our suppliers must comply with current good manufacturing practices (cGMP) enforced by FDA and other government agencies. Our suppliers are subject to unannounced inspection by regulators, including pre-approval inspections by FDA, to

ensure they are in strict compliance with government regulations and standards. Our suppliers may be forced to stop producing, storing, shipping or testing our drug products if they fall out of compliance with government regulations and standards.

We have no control over our suppliers' compliance, or lack thereof, with the multitude of regulations and standards that affect our drug products. We cannot control decisions by our suppliers that affect their ability or willingness to continue to supply us on acceptable terms, or at all.

Government Regulation

Our operations are subject to various levels of governmental controls and regulations in the United States and in Canada. We attempt to comply with all legal requirements in the conduct of our operations and employ business practices that we consider to be prudent under the circumstances in which we operate. Government authorities in the U.S. at the federal, state and local level and in Canada and other countries regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, post-approval monitoring and reporting, marketing and export and import of drug and diagnostic products. Generally, before a new drug or diagnostic can be marketed, considerable data demonstrating its quality, safety and efficacy and/or specificity must be obtained, organized into a format specific for each regulatory authority, submitted for review and approved by each regulatory authority.

U.S. Drug Development

In the U.S., FDA regulates drugs under the Food, Drug, and Cosmetic Act (FDCA). Both drugs and diagnostics also are subject to other federal, state and local statutes and regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or post-market may subject an applicant to administrative or judicial sanctions. These sanctions could include, among other actions, FDA's refusal to approve pending applications, withdrawal of an approval, a clinical hold, untitled or warning letters, product recalls or market withdrawals, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement and civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

Product candidates must be approved by FDA before they may be commercialized in the U.S. The drug approval process generally involves the following:

- Completion of extensive preclinical studies in accordance with applicable regulations, including studies conducted in accordance with good laboratory practice;
- Submission to FDA of an IND, which must become effective before human clinical studies may begin;
- Approval by an independent institutional review board (IRB) or ethics committee before each study may be initiated;
- Performance of adequate and well-controlled human clinical studies in accordance with applicable IND regulations, code of good clinical practice (cGCP), requirements and other clinical trial-related regulations to establish the safety and efficacy of the investigational product for each proposed indication;
- Submission to FDA of an NDA;
- A determination by FDA within 60 days of its receipt of an NDA to accept the filing for review;
- Satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities where the drug will be produced to assess compliance with cGMP, requirements to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity;
- Potential FDA audit of the preclinical study and/or clinical study sites that generated the data in support of the NDA;
- FDA review and approval of the NDA, including consideration of the views of any FDA advisory committee, prior to any commercial marketing or sale of the drug in the U.S.; and
- Compliance with any post-approval requirements, including the potential requirement to conduct post-approval studies.

The data required to support an NDA are generated in two distinct developmental stages: preclinical and clinical. The preclinical and clinical testing and approval process requires substantial time, effort and financial resources, and we cannot be certain that any approvals for any future product candidates will be granted on a timely basis, or at all.

Preclinical Studies and IND

The preclinical developmental stage generally involves laboratory evaluations of drug chemistry, formulation and stability, as well as studies to evaluate toxicity in animals, which support subsequent clinical testing. As sponsor, we must submit the results of the preclinical studies, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to FDA as part of the IND. An IND is a request for authorization from FDA to administer an investigational product to humans and must become effective before human clinical studies may begin.

Preclinical studies include laboratory evaluation of product chemistry and formulation, as well as in vitro and animal studies to assess the potential for adverse events and in some cases to establish a rationale for therapeutic use. The conduct of preclinical studies is subject to federal regulations and requirements, including cGCP regulations for safety/toxicology studies. An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical studies, among other things, to FDA as part of an IND. Some long-term preclinical testing, such as long-term toxicity tests, animal tests of reproductive adverse events and carcinogenicity, may continue after the IND is submitted. An IND automatically becomes effective 30 days after receipt by FDA, unless before that time FDA raises concerns or questions about any aspect of the program. In such a case, the IND sponsor and FDA must resolve any outstanding concerns before the clinical study can begin.

Clinical Studies

The clinical stage of development involves the administration of the investigational product to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the study sponsor's control, in accordance with cGCP requirements, which include the requirement that all research subjects provide their informed consent for their participation in any clinical trial. Clinical studies are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria and the parameters to be used to monitor subject safety and assess efficacy. Each protocol, and any subsequent amendments to the protocol, must be submitted to FDA as part of the IND. Furthermore, each clinical study must be reviewed and approved by an IRB for each institution at which the clinical study will be conducted to ensure that the risks to individuals participating in the clinical studies are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the informed consent form that must be provided to each clinical study subject or his or her legal representative and must monitor the clinical study until completed. There also are requirements governing the reporting of ongoing clinical studies and completed clinical study results to public registries.

A sponsor who wishes to conduct a clinical study outside of the U.S. may, but need not, obtain FDA authorization to conduct the clinical study under an IND. If a foreign clinical study is not conducted under an IND, the sponsor may submit data from the clinical study to FDA in support of an NDA. The FDA may accept a well-designed and well-conducted foreign clinical study not conducted under an IND if the study was conducted in accordance with cGCP requirements and FDA is able to validate the data through an onsite inspection if deemed necessary. We launched clinical sites in Canada in 2021 and plan to perform additional clinical studies outside of the U.S. and Canada in the future.

Clinical studies in the U.S. generally are conducted in three sequential phases, known as Phase 1, Phase 2 and Phase 3, and may overlap.

- Phase 1 clinical studies generally involve a small number of healthy volunteers or disease-affected patients who are initially exposed to a single dose and then multiple doses of the product candidate. The primary purpose of these clinical studies is to assess the metabolism, pharmacologic action, tolerability and safety of a drug candidate.
- Phase 2 clinical studies involve studies in disease-affected patients to determine the proper dose required to produce the desired benefits. At the same time, safety and further pharmacokinetic and pharmacodynamic information is collected, possible adverse effects and safety risks are identified, and a preliminary evaluation of efficacy may be observed.
- Phase 3 clinical studies generally involve many patients at multiple sites and are designed to provide the data necessary to demonstrate the effectiveness of the product for its intended use, its safety in use and to establish the overall benefit/risk relationship of the product and provide an adequate basis for product approval. These studies may include comparisons with placebo and/or other comparator treatments. The duration of treatment is often extended to mimic the actual use of a product during marketing.

Post-approval studies, sometimes referred to as Phase 4 clinical studies, may be conducted after initial marketing approval. These studies are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, FDA may mandate the performance of Phase 4 clinical studies as a condition of approval of an NDA.

Progress reports detailing the results of the clinical studies, among other information, must be submitted at least annually to FDA. Written safety reports and the investigators for serious and unexpected adverse events, or any other findings suggesting a significant risk to humans exposed to the drug must be submitted to FDA.

Phase 1, Phase 2, and Phase 3 clinical studies may not be completed successfully within any specified period, if at all. The FDA or the sponsor may suspend or terminate a clinical study 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 study at its institution if the clinical study is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients. Additionally, some clinical studies are overseen by an independent group of qualified experts organized by the clinical study sponsor, known as a data safety monitoring board. This group provides authorization for whether a study may move forward at designated check-points based on access to certain data from the trial. Concurrent with clinical studies, companies usually complete additional animal studies and must develop additional information about the chemistry and physical characteristics of the drug as well as 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 and, among other things, companies must develop methods for testing the identity, strength, quality and purity of the final product. Additionally, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that our product candidates do not undergo unacceptable deterioration over their shelf life.

NDA Review Process

Following completion of the clinical studies, data is analyzed to assess whether the investigational product is safe and effective for the proposed indicated use or uses. The results of preclinical studies and clinical studies are then submitted to FDA as part of an NDA, along with proposed labeling, chemistry and manufacturing information to ensure product quality and other relevant data. In short, the NDA is a request for approval to market a drug for one or more specified indication and must contain proof of safety and efficacy for a drug's purity and potency. The application may include both negative and ambiguous results of preclinical studies and clinical studies, as well as positive findings. Data may come from company-sponsored clinical studies intended to test the safety and efficacy of a product's use or from several alternative sources, including studies initiated by investigators. To support marketing approval, the data submitted must be sufficient in quality and quantity to establish the safety and efficacy of the investigational product to the satisfaction of FDA. FDA approval of an NDA must be obtained before a drug may be marketed in the U.S.

Under the Prescription Drug User Fee Act (PDUFA), as amended, each NDA must be accompanied by a user fee. FDA adjusts the PDUFA user fees on an annual basis. According to FDA's fiscal year 2022 fee schedule, effective through September 30, 2022, the user fee for an application requiring clinical data, such as an NDA, is approximately \$3.1 million. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. 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 all submitted NDAs before it accepts them for filing and may request additional information rather than accept the NDA for filing. The FDA must decide on accepting an NDA for filing within 60 days of receipt. Once the submission is accepted for filing, FDA begins an in-depth review of the NDA. Under the goals and policies agreed to by FDA under PDUFA, FDA has 10 months, from the filing date, in which to complete its initial review of a new molecular-entity NDA and respond to the applicant, and six months from the filing date of a new molecular-entity NDA designated for priority review. The FDA does not always meet its PDUFA goal dates for standard and priority NDAs, and the review process is often extended by FDA requests for additional information or clarification.

Before approving an NDA, FDA may conduct a pre-approval inspection of the manufacturing facilities for the new product to determine whether they comply with cGMP requirements. The FDA will not approve the product unless it determines that the manufacturing processes and facilities fully comply with cGMP requirements and are adequate to assure

consistent production of the product within required specifications. The FDA also may audit data from clinical studies to ensure compliance with cGCP requirements. Additionally, FDA may refer applications for novel product candidates which present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions, if any. The FDA is not bound by recommendations of an advisory committee, but it considers such recommendations when making decisions on approval. The FDA likely will reanalyze the clinical study data, which could result in extensive discussions between FDA and the applicant during the review process. After FDA evaluates an NDA, it will issue either an approval letter or a Complete Response Letter (CRL). An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. A CRL indicates that FDA's review of the application is complete and the application cannot be approved in its present form. A CRL usually describes the specific deficiencies in the NDA identified by FDA. The CRL may require additional clinical data, additional pivotal Phase 3 clinical trial(s) and/or other significant and time-consuming requirements related to clinical studies, preclinical studies or manufacturing. If a CRL is issued, the applicant may either resubmit the NDA, addressing all the deficiencies identified in the CRL, or withdraw the application. Even if such data and information are submitted, FDA may decide that the NDA does not satisfy the criteria for approval. Data obtained from clinical studies are not always conclusive and FDA may interpret data differently than we interpret the same data.

Advertising and Promotion

The FDA and other federal regulatory agencies closely regulate the marketing and promotion of drugs through, among other things, standards and regulations for direct-to-consumer advertising, communications regarding unapproved uses, industry-sponsored scientific and educational activities, and promotional activities involving the Internet. None of our product candidates can be commercially promoted before receiving FDA approval. After approval, product promotion can include only those claims relating to safety and effectiveness that are consistent with the labeling approved by FDA. Healthcare providers are permitted to prescribe drugs for "off-label" uses — that is, uses not approved by FDA and therefore not described in the drug's labeling — because FDA does not regulate the practice of medicine. However, FDA regulations impose stringent restrictions on manufacturers' communications regarding off-label uses. Failure to comply with applicable FDA requirements and restrictions in this area may subject us to adverse publicity and enforcement action by FDA, the U.S. Department of Justice, or the Office of the Inspector General of Health and Human Services, as well as state authorities. This could subject us to a range of penalties that could have a significant commercial impact, including civil and criminal fines and agreements that materially restrict the manner in which we promote or distribute our product candidates.

Post-Approval Requirements

After a product candidate receives regulatory approval, it is often subject to pervasive and continuing regulation by FDA, including, among other things, requirements relating to drug listing and registration, recordkeeping, periodic reporting, product sampling and distribution, adverse event reporting and advertising, marketing and promotion restrictions.

Adverse event reporting and submission of periodic reports is required following FDA approval of an NDA. The FDA also may require post-market testing, known as Phase 4 testing, or FDA may place conditions on an approval that could restrict the distribution or use of the product. In addition, quality control, drug manufacture, packaging, and labeling procedures must continue to conform to cGMP after approval. Drug manufacturers and certain of their subcontractors are required to register their establishments with FDA and certain state agencies. Registration may result in periodic announced or unannounced inspections by FDA or these state agencies, during which the agency inspects manufacturing facilities to assess compliance with cGMP. Accordingly, manufacturers must continue to expend time, money, and effort in the areas of production and quality control to maintain compliance with cGMP. Regulatory authorities may withdraw product approvals or request product recalls if a company fails to comply with regulatory standards, if it encounters problems following initial marketing, or if previously unrecognized problems are subsequently discovered. In addition, other regulatory actions may be taken, including, among other things, warning letters, the seizure of products, injunctions, consent decrees placing significant restrictions on or suspending manufacturing operations, refusal to approve pending applications or supplements to approved applications, civil penalties, and criminal prosecution.

The FDA may require post-approval clinical studies to help assure continued safety or effectiveness of the approved drug. The FDA may also require a labeling change if it becomes aware of new safety information that it believes should be included in the labeling of a drug.

The Hatch-Waxman Amendments

Orange Book Listing

In seeking approval for our product candidates through an NDA, we will be required to list with FDA each patent whose claims cover the drug product. Upon receiving regulatory approval, each of the patents listed in the application for this drug is then published in FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, commonly known as the "Orange Book". Drugs listed in the Orange Book can, in turn, be cited by potential generic competitors in support of approval of an abbreviated NDA, or ANDA. An ANDA provides for marketing of a drug product that has the same active ingredient in the same strengths and dosage form as the listed drug and has been shown through bioequivalence testing to be therapeutically equivalent to the listed drug. Other than the requirement for bioequivalence testing, ANDA applicants are not required to conduct, or submit results of, preclinical or clinical tests to prove the safety or efficacy of their drug product. Drugs approved in this way are commonly referred to as "generic equivalents" to the listed drug, and can often be substituted by pharmacists under prescriptions written for the original listed drug.

The ANDA applicant is required to make certain certifications to FDA concerning any patents listed for the approved product in FDA's Orange Book. Specifically, the applicant must certify that: (i) the required patent information has not been filed; (ii) the listed patent has expired; (iii) the listed patent has not expired but will expire on a particular date and approval is sought after patent expiration; or (iv) the listed patent is invalid or will not be infringed by the new product. The ANDA applicant may also elect to submit a section viii statement certifying that its proposed ANDA label does not contain (or carves out) any language regarding the patented method-of-use rather than make certifications concerning a listed method-of-use patent. If the applicant does not challenge the listed patents, the ANDA application will not be approved until all the listed patents claiming the referenced product have expired.

A certification that the new product will not infringe the already approved product's listed patents, or that such patents are invalid, is called a Paragraph IV certification. If the ANDA applicant has provided a Paragraph IV certification to FDA, the applicant must also send notice of the Paragraph IV certification to the NDA and patent holders once the ANDA has been accepted for filing by FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days of the receipt of a Paragraph IV certification automatically prevents FDA from approving the ANDA until the earlier of 30 months, expiration of the patent, settlement of the lawsuit, or a decision in the infringement case that is favorable to the ANDA applicant. The ANDA application also will not be approved until any applicable non-patent exclusivity listed in the Orange Book for the referenced product has expired.

Disclosure of Clinical Study Information

Sponsors of clinical studies of FDA-regulated products, including drugs, are required to register and disclose certain clinical study information. Information related to the product, patient population, phase of investigation, clinical study sites and investigators, and other aspects of the clinical study is then made public as part of the registration. Sponsors are also obligated to post certain information regarding the results of their clinical studies after completion. Disclosure of the results of these studies can be delayed until the new product or new indication being studied has been approved. Competitors may use this publicly available information to gain knowledge regarding the progress of development programs.

Other Regulatory Requirements

We may be subject to federal, state and local environmental laws and regulations, including the Environmental Protection Act and the Clean Air Act. Although we believe that our safety procedures for handling and disposing of controlled materials comply with the standards prescribed by state and federal regulations, accidental contamination or injury from these materials may occur. In the event of such an occurrence, we could be held liable for any damages that result and any such liability could exceed our resources.

We may also be subject to regulations under other federal, state, and local laws, including the Occupational Safety and Health Act, national restrictions on technology transfer, and import, export, and customs regulations. It is possible that any portion of the regulatory framework under which we operate may change and that such change could have a negative impact on our current and anticipated operations. Failure to comply with these requirements could result, among other things, in suspension of regulatory approval, recalls, injunctions or civil or criminal sanctions.

Third-Party Payor Coverage and Reimbursement

The commercial success of our product candidates, if approved, will depend, in part, upon the availability of coverage and adequate reimbursement from third-party payors at the federal, state and private levels. Third-party payors include governmental programs such as Medicare or Medicaid, private insurance plans and managed care plans. These third-party payors may deny coverage or reimbursement for our product candidates in whole or in part if they determine that our product candidates are not medically appropriate or necessary. Also, third-party payors attempt to control costs by limiting coverage through the use of formularies and other cost-containment mechanisms and the amount of reimbursement for particular procedures or drug treatments.

Some third-party payors also require pre-approval of coverage for new or innovative devices or drug therapies before they will reimburse healthcare providers who use such therapies. While we cannot predict whether any proposed cost-containment measures will be adopted or otherwise implemented in the future, these requirements or any announcement or adoption of such proposals could have a material adverse effect on our ability to obtain adequate prices for our approved product candidates to operate profitably.

Human Capital

Our approach to human capital resource management starts with our mission to detect and treat neurodegenerative diseases, such as Alzheimer's disease. Our industry exists in a complex regulatory environment. The unique demands of our industry, together with the challenges of running an enterprise focused on the discovery, development, manufacture and commercialization of innovative medicines, require talent that is highly educated and/or has significant industry experience. Additionally, for certain key functions, we require specific scientific expertise to oversee and conduct research and development activities and the complex manufacturing requirements for biopharmaceutical products.

We consider our ability to recruit, retain and motivate our employees to be critical to our success. We are an equal opportunity employer, and we are fundamentally committed to creating and maintaining a work environment in which employees are treated with respect and dignity. All human resources policies, practices and actions related to hiring, promotion, compensation, benefits and termination are administered in accordance with the principal of equal employment opportunity, meaning that they are made on the basis of individual skills, knowledge, abilities, job performance and other legitimate criteria and without regard to race, color, religion, sex, sexual orientation, gender expression or identity, ethnicity, national origin, ancestry, age, mental or physical disability, genetic information, any veteran status, any military status or application for military service, or membership in any other category protected under applicable law. By focusing on employee retention and engagement, we also improve our ability to support our clinical trials, our pipeline, business and operations, and also protect the long-term interests of our stockholders. Our success also depends on our ability to attract, engage and retain a diverse group of employees.

Our base pay program aims to compensate management and staff members relative to the value of the contributions of their role, which takes into account the skills, knowledge and abilities required to perform each position, as well as the experience brought to the job. We also provide cash incentive programs to reward our management team and staff members in alignment with achievement of Company-wide goals that are designed to drive aspects of our strategic priorities that support and advance our strategy across our Company. Our management team and staff members are eligible for the grant of equity awards under our long-term incentive program that are designed to align the experience of these staff with that of our stockholders.

Our benefit programs are also generally broad-based, promote health and overall well-being and emphasize saving for retirement. All management team and regular staff members are eligible to participate in the same core health and welfare and retirement savings plans. Other employee benefits include medical plans, dental plans, vacation and sick-pay plans, flexible spending accounts, life and accident insurance and short and long-term disability benefits.

Our Compensation Committee provides oversight of our executive compensation plans, policies and programs.

As of December 31, 2021, we had 24 full-time employees. None of our employees are represented by a labor union or covered under a collective bargaining agreement. We also engage numerous consultants to perform services on retainer, per diem or an hourly basis.

Impact of COVID-19 on our Business

During the COVID-19 pandemic, our top priorities are to protect the health, well-being, and safety of our employees and partners, while still focusing on the key drivers of our business. Despite COVID-19, we believe we may be on-track to achieve our major strategic objectives for 2022 with simufilam. We have generally not experienced major disruptions across our drug manufacturing operations or supply of materials. We have experienced some disruptions across certain investigational clinical study sites because of pandemic effects on job-loss, employment and other factors. Our broad spectrum of technical consultants, scientific advisors and service providers continue to provide timely services. We have adapted flexible business practices, such as remote work arrangements and temporary travel restrictions, to insure we continue to operate safely and cautiously while also meeting our public health responsibilities. We recognize the pandemic has created a dynamic and uncertain situation in the national economy. We continue to closely monitor the latest information to make timely, informed business decisions and public disclosures regarding the potential impact of pandemic on our operations. However, the scope of pandemic is unprecedented and its long-term impact on our operations cannot be reasonably estimated at this time.

Publication Corrections

An erratum or corrigendum is a correction of a published text, generally a production or author's error, that was not caught in proofing. Such errors generally do not impact data conclusions. We note the following corrections in our published works.

In July 2021, we presented clinical data for SavaDx in a poster presentation titled, “*SavaDx, a Novel Plasma Biomarker to Detect Alzheimer’s Disease, Confirms Mechanism of Action of Simufilam*” at the Alzheimer’s Association International Conference (AAIC) in Denver, CO and virtually. Publication correction: the AAIC data and data analysis are correct, however, visual errors that were not caught in proofing were disclosed by the Company in September 2021. This error does not impact data conclusions.

In 2017, we published in *Neurobiology of Aging* an article titled “PTI-125 binds and reverses an altered conformation of filamin A to reduce Alzheimer’s disease pathogenesis” (Vol 55, July 2017, Pages 99–114). Publication correction: Figure 12 contains an image showing 12 control bands. It should show 13. The data analysis was based on all 13 control bands. Other human errors in this publication have been noted and are expected to be corrected and published. These errors do not impact data conclusions.

In 2012, we published in the *Journal of Neuroscience* an article titled, “*Reducing Amyloid-Related Alzheimer’s Disease Pathogenesis by a Small Molecule Targeting Filamin A*” (*JNeurosci* 2012;32:9773-9784). Publication correction: a duplicated panel appears in Figure 8B of the article. This error does not impact data conclusions and the publisher is expected to print a correction.

Citizen Petitions Filed with FDA

Four Citizen Petitions regarding our research program in Alzheimer’s disease were submitted to FDA during August through November 2021, by various third parties.

In August 2021, an attorney representing anonymous clients submitted a Citizen Petition to the FDA requesting an immediate halt to the clinical development of simufilam, our lead drug candidate. The attorney subsequently disclosed in a press release that his clients are “short-sellers”, that is, investors who earn a profit from a decline in our stock price. FDA did not halt the clinical development of simufilam. In February 2022, FDA denied this Citizen Petition and its four supplements.

In September 2021, the same attorney representing short-sellers clients submitted a Citizen Petition requesting that FDA immediately rescind previously granted Special Protocol Assessments (SPAs) for our Phase 3 clinical program with simufilam. FDA did not rescind our SPAs. In February 2022, FDA denied this Citizen Petition and its supplement.

In October 2021, an individual not previously known to us submitted a Citizen Petition to FDA requesting “*FDA [approve] Simufilam and immediate initiation of Phase 4 trials for further efficacy, safety assessment and, most critically, to address one of the greatest needs in modern science.*” FDA has not ruled on this Citizen Petition.

In November 2021, an academic physician not previously known to us submitted a Citizen Petition to FDA requesting “*Accelerated Approval of Simufilam for the most significant medical need in the United States of America.*” The FDA has not ruled on this Citizen Petition.

No assurance can be given that FDA will grant, deny, dismiss, defer or otherwise act upon these or any other Citizen Petition or supplements within any timeframe, if ever.

Corporate Information

We were incorporated as a Delaware corporation in May 1998 under the name Pain Therapeutics, Inc. In March 2019, we changed our company name to Cassava Sciences, Inc. Our principal offices are located at 7801 N. Capital of Texas Highway, Suite 260, Austin, TX, 78731. Our telephone number is 512-501-2444. Our website address is www.CassavaSciences.com. Information contained on our website is not a part of this Annual Report on Form 10-K and the inclusion of our website address in this Annual Report on Form 10-K is an inactive textual reference only.

We use Cassava Sciences, the Cassava Sciences logo, artwork and other marks as trademarks in the United States and other countries. Solely for convenience, trademarks and trade names referred to in this Annual Report, including logos, artwork, and other visual displays, may appear without the ® or TM symbols, but such references are not intended to indicate in any way that we will not assert, to the fullest extent under applicable law, our rights, or the rights of the applicable licensor to these trademarks and trade names. We do not intend our use or display of other entities' trade names, trademarks, or service marks to imply a relationship with, or endorsement or sponsorship of us by, any other entity.

We file electronically with the Securities and Exchange Commission, or SEC, our annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934. The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. The address of the site is <http://www.sec.gov>.

You may obtain a free copy of our annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K and amendments to those reports on the day of filing with the SEC on our website at <http://www.cassavasciences.com>, by contacting our corporate offices by calling 512-501-2450 or by sending an e-mail message to IR@cassavasciences.com.

Item 1A. Risk Factors

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the risks described below, as well as other information contained in this Annual Report on Form 10-K, including our consolidated financial statements and the related notes and the section titled “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” before deciding whether to invest in our common stock. The occurrence of any of the events or developments described below could harm our business, financial condition, results of operations, and growth prospects. In such an event, the market price of our common stock could decline, and you may lose all or part of your investment.

Below is a summary of the principal factors that make an investment in our common stock speculative or risky. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations and the market price of our common stock.

Risks Related to the Discovery, Development, and Commercialization of Our Product Candidates

- *Since 2017, we have concentrated a substantial portion of our research and development efforts on the treatment of Alzheimer’s disease, an area of research that has seen significant failure rates. Further, our product candidates are based on new scientific approaches and novel technology, which makes it difficult to predict the time and cost of product candidate development and likelihood of success.*
- *We are heavily dependent on the success of simufilam, our product candidate which is still under development. If this product candidate does not receive regulatory approval, we will be unable to generate product revenue and our business will be harmed.*
- *We have a limited operating history in our business targeting Alzheimer’s disease and no history of product approvals for commercial sale, which may make it difficult to evaluate our current business and predict our future success and viability.*
- *We cannot give any assurance that any of our product candidates will receive regulatory approval, which is necessary before they can be commercialized.*
- *There can be no assurance that results of smaller Phase 1 and Phase 2 clinical trials or open-label study with simufilam will be reproduced in our large Phase 3 studies that are required to demonstrate safety and efficacy in order to potentially receive regulatory approval.*
- *We may encounter substantial delays in our clinical studies or may not be able to conduct or complete our clinical studies on the timelines we expect, if at all.*
- *If physicians and patients do not accept and use our drugs, we will not achieve sufficient product revenues and our business will suffer.*

Risks Related to Government Regulation and Other Legal Compliance Matters

- *Our financial condition and operating results could be adversely impacted by unfavorable results of legal proceedings, government investigations or allegations and other claims.*
- *If we are ultimately unable to obtain regulatory approval for our product candidates, we will be unable to generate product revenue and our business will be substantially harmed.*
- *Our ability to market and promote our product candidates will be determined and limited by FDA-approved labeling.*
- *Our employees, independent contractors, consultants, commercial partners, and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.*
- *If we fail to comply with the complex federal, state, local and foreign laws and regulations that apply to our business, we could suffer severe consequences that could materially and adversely affect our operating results and financial condition.*
- *Government agencies may establish and promulgate usage guidelines that could limit the use of our product candidates.*

Risks Related to Our Intellectual Property

- *If we are unable to obtain and maintain sufficient patent protection for any product candidates we develop, our competitors could develop and commercialize products similar or identical to ours, and our ability to successfully commercialize any product candidates we may develop may be adversely affected.*
- *U.S. intellectual property rights around diagnostic methods is a complex, evolving area of law and effective patent claims may not be available to us for our investigational diagnostic product candidate, SavaDx, in the United States.*
- *Issued patents covering our product candidates and other technologies could be found invalid or unenforceable if challenged in court or before administrative bodies in the U.S. or abroad.*
- *If we do not obtain patent term extension and data exclusivity for any product candidates we may develop, our business may be materially harmed.*
- *If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be materially harmed.*

Risks Related to Our Business and Operations

- *Our reputation and operations could be adversely impacted by allegations, regardless of their merits.*
- *Our ability to continue to operate without any significant disruptions will, in part, depend on our ability to source raw materials and clinical supplies via our product supply chains.*
- *The worldwide outbreak of the COVID-19 virus and associated mutations or variants may materially and adversely affect our business operations and our ability to conduct clinical studies.*
- *Our reliance on third parties for both the supply and manufacture of materials for our product candidates carries the risk that we will not have sufficient quality or quantities of such materials or product candidates, or that such supply will not be available to us at an acceptable cost, which could delay, prevent, or impair our development or commercialization efforts.*
- *We expect to grow the size and capabilities of our organization, including accessing new physical facilities, and we may experience difficulties in effectively managing this growth.*
- *Ownership of our corporate headquarters and property leasing to third parties are subject to numerous risks and uncertainties.*
- *Our internal computer systems, or those used by third parties on whom we rely, may fail or suffer other breakdowns, cyberattacks, or information security breaches that could compromise the confidentiality, integrity, and availability of such systems and data, result in material disruptions of our development programs and business operations, risk disclosure of confidential, financial, or proprietary information, and affect our reputation.*
- *Our business involves environmental risks that may result in liability for us.*
- *Business disruptions and lack of appropriate levels of commercial insurance could seriously harm our future revenue and financial condition and increase our costs and expenses.*
- *Social media platforms present risks and challenges.*

Risks Related to Financial Condition and Capital Requirements

- *We have incurred significant net losses in each period since our inception and anticipate that we will continue to incur net losses for the foreseeable future.*
- *We have broad discretion in the use of the net proceeds from any of our financing transactions and may not use them effectively.*
- *We have no product revenues and may never achieve revenues or profitability based on product revenues.*

Risks Related to the Ownership of Our Common Stock

- *We do not know whether a sufficient market will continue to develop for our common stock or what the market price of our common stock will be, and, as a result, it may be difficult for investors to sell shares of our common stock.*
- *The market price of our common stock has historically been highly volatile and we expect it to continue to be volatile, which could result in substantial losses for investors who purchase our shares.*
- *If we are unable to maintain effective internal controls, our business, financial position, and results of operations could be adversely affected.*

- *Anti-takeover provisions in our charter documents and Delaware law may prevent or delay removal of incumbent management or a change of control.*
- *Changes in our ownership could limit our ability to utilize net operating loss carryforwards.*

Risks Related to the Discovery, Development, and Commercialization of Our Product Candidates

Since 2017, we have concentrated a substantial portion of our research and development efforts on the treatment of Alzheimer’s disease, an area of research that has seen significant failure rates. Further, our product candidates are based on new scientific approaches and novel technology, which makes it difficult to predict the time and cost of product candidate development and likelihood of success.

Since 2017, we have concentrated a substantial portion of our research and development efforts on experimental methods for the treatment of Alzheimer’s disease. Prior efforts by biopharmaceutical companies to develop new treatments for Alzheimer’s disease have seen very limited clinical success. Since 2003, several large Phase 3 clinical studies in Alzheimer’s disease have been completed, yet no drug candidate has shown clear evidence of safety and clinical efficacy. There are no FDA-approved disease modifying therapeutics available for patients with Alzheimer’s disease. Notwithstanding these substantial challenges to date, we seek to improve brain health by addressing the neurodegeneration and neuroinflammation components of Alzheimer’s disease. Our lead drug candidate for Alzheimer’s disease is based on a new approach of stabilizing – but not removing – a critical protein in the brain. We cannot be certain that our novel technologies will lead to an approvable or marketable product. In addition, because FDA has limited comparators to evaluate our lead drug candidate, we could experience a longer than expected regulatory review process and increased development costs.

We are heavily dependent on the success of simufilam, our product candidate which is still under development. If this product candidate does not receive regulatory approval, we will be unable to generate product revenue and our business may be harmed.

Since inception, we have not succeeded in getting regulatory approval for our product candidates and we may never do so. In recent years, we have invested a significant portion of our efforts and financial resources in the development of simufilam and, to a lesser extent, SavaDx, for the treatment and detection of Alzheimer’s disease, respectively. Our future success is substantially dependent on our ability to successfully complete clinical development and obtain regulatory approval for simufilam, which may never occur. We expect that a substantial portion of our efforts and expenditures over the next few years will be devoted to simufilam and, to a lesser extent, SavaDx. This will require additional clinical development, management of clinical and manufacturing activities, regulatory approval in one or more national jurisdictions and obtaining commercial-scale manufacturing supply. Substantial investment and significant efforts will be required before we can generate any revenues from any commercial sales. We cannot be certain that we will be able to successfully complete any of these activities.

We have a limited operating history in our business targeting Alzheimer’s disease and no history of product approvals for commercial sale, which may make it difficult to evaluate our current business and predict our future success and viability.

We are a clinical-stage biopharmaceutical company with a limited operating history in our business targeting Alzheimer’s disease. Since we commenced operations in 1998, we have had no product candidates approved for commercial sale and have not generated any revenue from product sales. Drug development is a highly uncertain undertaking and involves a substantial degree of risk. To date, we have not completed a pivotal clinical study involving Alzheimer’s disease, obtained marketing approval for any product candidates, or conducted sales and marketing activities necessary for successful product commercialization. Our long operating history as a company without product revenue makes any assessment of our future success and viability subject to significant uncertainty.

We will continue to encounter risks and difficulties frequently experienced by clinical-stage biopharmaceutical companies in rapidly evolving fields. We have not yet demonstrated an ability to successfully overcome such risks and difficulties. If we do not successfully address these risks and difficulties, our business, results of operations and financial condition will suffer materially.

We cannot give any assurance that any of our product candidates will receive regulatory approval, which is necessary before they can be commercialized.

To date, we have invested substantial effort and financial resources to identify, procure intellectual property for, and develop our programs in neurodegeneration, including conducting preclinical and clinical studies for our product candidates, simufilam and SavaDx, and providing general and administrative support for these operations. Our future success is dependent on our ability to successfully develop, obtain regulatory approval for, and then successfully commercialize our product candidates, and we may fail to do so for many reasons, including the following:

- our product candidates may not successfully complete preclinical studies or clinical studies;
- a product candidate may, on further study, be shown to have harmful side effects or other characteristics that indicate it is unlikely to be effective or otherwise does not meet applicable regulatory criteria;
- our competitors may develop products that render our product candidates obsolete or less attractive;
- the product candidates that we develop may not be sufficiently covered by intellectual property;
- the product candidates that we develop may be challenged by third parties' patents or other intellectual property or exclusive rights;
- the market for our product candidates may change so that the continued development of a product candidate is no longer reasonable or commercially attractive;
- our product candidates may not be capable of being produced in commercial quantities at an acceptable cost, or at all;
- if a product candidate obtains regulatory approval, we may be unable to establish sales and marketing capabilities, or successfully market such approved product candidate, to gain market acceptance; and
- a product candidate may not be accepted as safe, effective or useful by patients, the medical community or third-party payors, if applicable.

If any of these events occur, we may be forced to abandon our development efforts for a program or programs, which would have a material adverse effect on our business and could potentially cause us to cease operations.

We may not be successful in our efforts to further develop our product candidates. We are not permitted to market or promote any of our product candidates before we receive regulatory approval from FDA or comparable foreign regulatory authorities, and we may never receive such regulatory approval for any of our product candidates. SavaDx is in the early stages of development. Simufilam, our late-stage product candidate, will require significant additional clinical development, management of preclinical, clinical, and manufacturing activities, regulatory approval, adequate manufacturing supply, a commercial organization, and significant marketing efforts before we generate any revenue from product sales, if at all.

We have never completed a product development program in neurodegeneration. Further, we cannot be certain that any of our product candidates will be successful in clinical studies. We may in the future advance product candidates into clinical studies and terminate such studies prior to their completion.

If any of our product candidates successfully complete clinical studies, we may seek regulatory approval to market our product candidates in the U.S., Japan, Canada, the United Kingdom or the European Union, and in additional foreign countries where we believe there is a viable commercial opportunity. We may never receive regulatory approval to market any product candidates anywhere even if such product candidates successfully complete clinical studies, which would adversely affect our viability. To obtain regulatory approval in countries outside the U.S., we would need to comply with numerous and varying regulatory requirements of such other countries regarding safety, efficacy, manufacturing and controls, clinical studies, commercial sales, pricing, and distribution of our product candidates. Even if we are successful in obtaining approval in one jurisdiction, we cannot ensure that we will obtain approval in any other jurisdictions. If we are unable to obtain approval for our product candidates in multiple jurisdictions, our business, financial condition, results of operations, and our growth prospects could be negatively affected.

Even if we receive regulatory approval to market any of our product candidates, whether for the treatment or diagnosis of neurodegenerative diseases or other diseases, we cannot provide assurance that any such product candidate will be successfully commercialized, widely accepted in the marketplace or more effective than other commercially available alternatives.

Investment in biopharmaceutical product development involves significant risk that any product candidate will fail to demonstrate adequate efficacy or an acceptable safety profile, gain regulatory approval, and become commercially viable. We cannot provide any assurance that we will be able to successfully advance any of our product candidates through the development process or, if approved, successfully commercialize any of our product candidates.

There can be no assurance that results of smaller Phase 1 and Phase 2 clinical trials or open-label study with simufilam will be reproduced in our large Phase 3 studies that are required to demonstrate safety and efficacy in order to potentially receive regulatory approval.

Results of our Phase 1, Phase 2 and open-label safety studies with simufilam may not be predictive of the results of later-stage clinical trials. Simufilam may fail to show the desired safety and efficacy in later clinical trials despite having progressed through preclinical studies and initial clinical trials. Many companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or adverse safety profiles, notwithstanding promising results in earlier trials. In addition, conclusions based on data from analyses of Phase 1 and Phase 2 clinical studies and open-label results may not be reproduced when implemented in large, well-controlled, randomized clinical trials. Even if our clinical trials for simufilam are completed as planned, we cannot be certain that their results will support the safety and efficacy sufficient to obtain regulatory approval.

We may encounter substantial delays in our clinical studies or may not be able to conduct or complete our clinical studies on the timelines we expect, if at all.

Clinical testing is expensive, time consuming, and subject to uncertainty. We cannot guarantee that any clinical studies will be conducted as planned, enroll patients as planned or be completed on schedule, if at all. Moreover, even after our studies begin, safety or other issues may arise that could suspend or terminate such clinical studies. A failure of one or more clinical studies can occur at any stage of testing, and our future clinical studies may not be successful. Events that may prevent successful or timely initiation or completion of clinical studies include:

- inability to generate sufficient preclinical, toxicology, or other in vivo or in vitro data to support the initiation or continuation of clinical studies;
- delays in confirming target engagement, patient selection, or other relevant biomarkers to be utilized in preclinical and clinical product candidate development;
- delays in reaching a consensus with regulatory agencies on study design;
- delays in reaching an agreement on acceptable terms with prospective and clinical study sites, the terms of which can be subject to extensive negotiation and may vary significantly among different clinical study sites;
- delays in identifying and recruiting suitable clinical investigators;
- delays in obtaining required IRB approval for each clinical study site;
- a new safety finding that presents unreasonable risk to clinical study participants;
- a negative finding from an inspection of our clinical research organization (CRO), clinical study operations or study sites; or
- the finding that the investigational protocol or plan is deficient to meet its stated objectives;
- delays in identifying, recruiting, and enrolling suitable patients to participate in our clinical studies, and delays caused by patients withdrawing from clinical studies, or failing to return for post-treatment follow-up;
- delays caused by disease epidemics or pandemics, such as COVID-19;
- difficulty collaborating with patient groups and investigators;

- failure by our CRO or other third parties, or us to adhere to clinical study requirements;
- failure to perform in accordance with FDA's or any other regulatory authority's Code of Good Clinical Practice (GCPs) requirements, or other regulatory guidelines in other countries;
- occurrence of adverse events associated with the product candidate that are viewed to outweigh its potential benefits;
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols;
- changes in the standard of care on which a clinical development plan was based, which may require new or additional studies;
- the cost of clinical studies of our product candidates being greater than we anticipate;
- clinical studies of our product candidates producing negative or inconclusive results, which may result in our deciding, or regulators requiring us, to conduct additional clinical studies or abandon product development programs; and
- delays in manufacturing, testing, releasing, validating, or importing/exporting sufficient stable quantities of our product candidates for use in clinical studies or the inability to do any of the foregoing.

Any inability to successfully initiate or complete clinical studies could result in additional costs to us or impair our ability to generate revenue. In addition, if we make manufacturing or formulation changes to our product candidates, we may be required to, or we may elect, to conduct additional studies to bridge our modified product candidates to earlier versions. Clinical study delays could also shorten any periods during which our products have patent protection and may allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our product candidates and may harm our business and results of operations.

We may in the future advance product candidates into clinical studies and terminate such studies prior to their completion, which could adversely affect our business.

Delays in the completion of any clinical study of our product candidates will increase our costs, slow down our product candidate development and approval process and delay, or potentially jeopardize our ability to commence product sales and generate revenue. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical studies may also ultimately lead to the denial of regulatory approval of our product candidates.

The FDA or other regulatory agency may put a clinical hold on our clinical studies and our business will suffer.

A clinical hold is an order issued by FDA or other regulatory agency to suspend an ongoing clinical trial, typically due to newly identified deficiencies with our studies or our drug candidate. For example, we are aware that in 2022, FDA has placed clinical holds on drug candidates for Alzheimer's disease from two competitors, Cortexyme Inc. and Denali Therapeutics Inc. The grounds for imposition of a clinical hold are complex, variable and somewhat arbitrary. If FDA imposes a clinical hold on us, no new subjects may be enrolled and study subjects already in a study may be taken off our drug candidate unless treatment is specifically permitted by FDA in the interest of patient safety. If we are issued a clinical hold, FDA will expect us to address the cited deficiencies and submit a detailed, written response. A clinical hold may require us to spend significant resources over many months to address the root causes of FDA's concerns. We may not find and successfully address such root causes, which could adversely affect our business. Our response may not be adequate to lift such clinical hold, or we may disagree with FDA's assessments of deficiencies. If we are on clinical hold for 1 year or longer, the FDA may consider our IND for simufilam to fall into Inactive Status, which may result in termination of the clinical program for simufilam. To the extent we are not successful in lifting an FDA clinical hold, our results of operations and business will be materially adversely affected.

If physicians and patients do not accept and use our drugs, we will not achieve sufficient product revenues and our business will suffer.

Even if FDA approves our drugs, physicians and patients may not accept and use them. Acceptance and use of our drugs will depend on a number of factors including:

- when the drug is launched into the market and related competition;
- approved label claims;
- perceptions by members of the healthcare community, including physicians, about the safety and effectiveness of our drugs;
- perceptions by physicians regarding the cost-benefit of our product candidates;
- published studies demonstrating the cost effectiveness of our drugs relative to competing products;
- availability of reimbursement for our products from government or healthcare payers;
- effectiveness of marketing and distribution efforts by us and other licensees and distributors.

Because we expect to rely on sales generated by our current lead product candidates for substantially all of our revenues for the foreseeable future, the failure of any of these drugs to find market acceptance would harm our business and could require us to seek additional financing.

We may not be successful in developing our product candidates in neurodegeneration.

Our product candidates in neurodegeneration are still in development and will take several more years to develop and must undergo extensive clinical and scientific validations. Even if we are successful in developing any of our product candidates through clinical and scientific validation, we may not be able to develop a drug or a diagnostic that:

- meets applicable regulatory standards, in a timely manner or at all;
- successfully competes with other technologies and tests;
- avoids infringing the proprietary rights of others;
- is adequately reimbursed by third-party payors;
- can be performed at commercial levels or at reasonable cost; or
- can be successfully marketed.

To the extent we are not successful in developing our new product candidates in neurodegeneration, our results of operations and business will be materially adversely affected.

Interim, “top-line” and preliminary data from our clinical trials that we announce or publish from time to time are likely to change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final dataset.

From time to time, we may publish interim, “top-line” or preliminary data from our 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. Preliminary or “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, interim and preliminary data should be viewed with caution until the final data is available. Differences between preliminary or interim data and final data could significantly harm our business prospects and may cause the trading price of our common stock to fluctuate significantly.

We currently have no in-house capabilities to manufacture or commercialize our product candidates and we rely on third-party commercial drug manufacturers for clinical drug supplies. If we are unable to develop our own manufacturing, sales, marketing and distribution capabilities, or if we are not successful in contracting with third parties for these services on favorable terms, or at all, our product revenues could be adversely impacted.

We rely on various third parties to manufacture, fill, label, store, test and ship our product candidates. We plan to continue to outsource formulation, manufacturing and related activities. These suppliers must comply with cGMP regulations enforced by FDA and other government agencies, and are subject to ongoing periodic unannounced inspection, including preapproval inspections by FDA and corresponding state and foreign government agencies to ensure strict compliance with cGMP and other standards. These manufacturers may subsequently be stopped from producing, manufacturing, filling, labeling, storing, testing and shipping our product candidates due to their non-compliance with federal, state or local regulations. We do not have control over our suppliers' compliance with these regulations and standards and we cannot control decisions by our suppliers that affect their ability or willingness to continue to supply us on acceptable terms, or at all.

Disputes in the past have arisen with some of these third parties with respect to fulfilling certain conditions and obligations. There can be no guarantee that such disputes will not arise again in the future, which may lead to termination of an agreement. If an agreement is terminated, we would not be able to commercialize our product candidates until another manufacturer is identified and we have entered into a manufacturing agreement with such manufacturer. We may not be able to replace a commercial supplier on commercially reasonable terms, or at all. Replacing any of our commercial suppliers would be expensive and time consuming. Failure by any of our suppliers to perform as expected could delay or prevent the commercialization or potential regulatory approval of our product candidates for an extended period of time, result in shortages, cost overruns or other problems and would materially harm our business.

We currently have no sales, marketing or distribution capabilities. We have not established commercial strategies regarding any of our product candidates. In order to commercialize our products, if any are approved by FDA, we will either have to develop such capabilities internally or collaborate with third parties who can perform these services for us.

If we decide to commercialize any of our drugs ourselves, we may not be able to

- hire and retain the necessary experienced personnel;
- build sales, marketing and distribution operations in a cost-effective manner which are capable of successfully launching new drugs;
- obtain access to adequate numbers of physicians to prescribe our products; or
- generate sufficient product revenues.

In addition, establishing such operations on our own will take time and involve significant expense. If our commercial operations lack complementary products, we may not be able to compete in a cost-effective manner with competitors with more products to sell. If we engage third-party collaborators to perform any commercial operations, our future revenues may depend significantly upon the performance of those collaborators.

If we decide to enter into new co-promotion or other licensing arrangements with third parties, we may be unable to locate acceptable collaborators because the number of potential collaborators is limited and because of competition from others for similar alliances. Even if we are able to identify one or more acceptable new collaborators, we may not be able to enter into any collaborative arrangements on favorable terms, or at all.

In addition, due to the nature of the market for our product candidates, it may be necessary for us to license all or substantially all of our product candidates to a single collaborator, thereby eliminating our opportunity to commercialize these other products independently. If we enter into any such new collaborative arrangements, our revenues are likely to be lower than if we marketed and sold our products ourselves.

In addition, any revenues we receive would depend upon our collaborators' efforts which may not be adequate due to lack of attention or resource commitments, management turnover, change of strategic focus, business combinations or other factors outside of our control. Depending upon the terms of our collaboration, the remedies we have against an under-performing collaborator may be limited. If we were to terminate the relationship, it may be difficult or impossible to find a replacement collaborator on acceptable terms, or at all.

Nearly every attempt at drug approval for Alzheimer's disease has failed.

Despite billions of dollars invested by NIH and the biopharmaceutical industry in research programs to develop novel therapeutics for Alzheimer's disease, the FDA has not approved any new drugs for Alzheimer's disease since 2003, except, however, that in June 2021, aducanumab (Biogen, Inc) received approval from FDA for the treatment of Alzheimer's disease using the accelerated approval pathway. Since 2003, many new types and classes of drugs have been developed and tested in Alzheimer's disease, including monoclonal antibodies, gamma secretase modulators and inhibitors, β -site amyloid precursor protein cleaving enzyme (BACE) inhibitors, receptor for advanced glycation end-products (RAGE) inhibitors, nicotinic partial agonists and allosteric modulators, serotonin subtype receptor (5HT6) antagonists, and others. Virtually all of these scientific programs have failed in clinical testing.

We may not be successful in our efforts to expand our technology or product candidates in other indications.

Our drug development strategy is to clinically test and seek regulatory approval for our product candidates in Alzheimer's disease, our primary indication. We may expand our research efforts outside of this primary indication and into other areas of clinical medicine based on genetic, biological or mechanistic overlap with the primary indication. Conducting clinical studies for additional indications for our product candidates will require substantial technical, financial and human resources and is prone to the inherent risks of failure in drug development. We cannot provide any assurance that we will be successful in our effort to expand our technology or our product candidates in additional indications, even if we obtain approval for our product candidate in Alzheimer's disease.

If we fail to successfully identify and develop additional product candidates, our commercial opportunity will be limited to Alzheimer's disease or other neurodegenerations.

Identifying, developing, obtaining regulatory approval, and commercializing additional product candidates requires substantial expertise and funding and is prone to the risks of failure inherent in drug development. We cannot provide any assurance that we will be able to successfully identify or acquire additional product candidates, advance any additional product candidates through the development process, or assemble sufficient resources to identify, acquire, or develop additional product candidates. If we are unable to successfully identify, acquire, develop, and commercialize additional product candidates, our commercial opportunity may be limited.

Early indications of safety and tolerability from our small clinical studies with simufilam may not predict the results of later studies.

Results of a Phase 1 clinical study with simufilam demonstrated safety, tolerability and pharmacokinetics in 24 healthy subjects exposed to 50-200 mg in a single ascending dose study. However, this was a small, "first-in-human" Phase 1 study designed to assess the initial safety characteristics of simufilam in healthy subjects and this study was not designed to, and did not, evaluate safety, tolerability and efficacy of simufilam in patients. Additional large, well-controlled, multi-dose studies will be required to evaluate the safety, tolerability and efficacy of simufilam to treat patients with any indication, including Alzheimer's disease. There can be no assurance that such future studies will demonstrate the safety, tolerability or efficacy of simufilam.

Phase 2 clinical studies with simufilam were designed to assess the safety characteristics of simufilam in patients. Our Phase 2 program was not designed to, and did not, evaluate large-scale or long-term safety, tolerability and efficacy of simufilam in patients. Additional large, well-controlled, multi-dose studies will be required to evaluate the safety, tolerability and efficacy of simufilam to treat patients with any indication, including Alzheimer's disease. There can be no assurance that such future studies will demonstrate the safety, tolerability or efficacy of simufilam. The failure of simufilam to show safety, tolerability or efficacy in any future clinical studies would significantly harm our business.

We have never obtained FDA approval for a diagnostic test and we may not be able to secure such approval in a timely manner or at all.

We are developing a blood-based diagnostic test for Alzheimer's disease, called SavaDx, which will require FDA approval prior to commercialization. Our diagnostic product candidate, marketing, sales and development activities and manufacturing processes are subject to extensive and rigorous regulation by FDA pursuant to the FDCA, by comparable agencies in foreign countries, and by other regulatory agencies and governing bodies. Under the FDCA, a diagnostic must

receive FDA clearance or approval before it can be commercially marketed in the U.S. The process of obtaining marketing approval or clearance from FDA or by comparable agencies in foreign countries for new products could:

- take a significant period of time;
- require the expenditure of substantial resources;
- involve rigorous preclinical testing, as well as increased post-market surveillance;
- require changes to products; and
- result in limitations on the indicated uses of products.

If we do not compete effectively with scientific and commercial competitors, we may not be able to successfully develop our diagnostic test for Alzheimer's disease.

The field of clinical laboratory testing is highly competitive. Diagnostic tests that are developed are characterized by rapid technological change. Our competitors in the U.S. and abroad are numerous and include, among others, major diagnostic companies, reference laboratories, molecular diagnostic firms, universities and other research institutions. Most of our potential competitors have considerably greater financial, technical, marketing and other resources than we do, which may allow these competitors to discover important biological markers and determine their function before we do. We could be adversely affected if we do not discover proteins or biomarkers and characterize their function, develop diagnostic and pharmaceutical and clinical services based on these discoveries, obtain required regulatory and other approvals and launch these tests and their related services before our competitors. We also expect to encounter significant competition with respect to any diagnostic tests that we may develop or commercialize. Those companies that bring to market new diagnostic tests before we do may achieve a significant competitive advantage in marketing and commercializing their tests. We may not be able to develop additional diagnostic tests successfully and we may not obtain or enforce patents, if any, covering these tests that provide protection against our competitors. Moreover, our competitors may succeed in developing diagnostic tests that circumvent our technologies or tests. Furthermore, our competitors may succeed in developing technologies or tests that are more effective or less costly than those developed by us or that would render our technologies or tests less competitive or obsolete. We expect competition to intensify in the fields in which we are involved as technical advances in these fields occur and become more widely known and changes in intellectual property laws generate challenges to our intellectual property position.

We will need to develop our own proprietary antibodies or find alternative approaches that do not involve antibodies to advance our SavaDx and our diagnostic program.

SavaDx currently relies on the use of commercially available antibodies, which are complex molecules that can recognize and bind to an intended protein. Commercially available antibodies present certain technical flaws, such as improper validation, significant batch-to-batch variations or inconsistent storage, any of which can jeopardize our studies and experiments. Because antibody underperformance can be a significant drain on time and resources, we have attempted to develop and validate our own, fit-for-purpose antibody for use with SavaDx. The complexity of developing our own antibody gives rise to many technical issues that are challenging to solve, and we cannot be certain that we will be able to successfully complete any of these activities, in which case our program may be harmed. We are also evaluating an alternative approach to detect Alzheimer's disease that does not involve antibodies. The complexity of such an alternative approach also gives rise to many technical issues that are challenging to solve. We cannot be certain that we will be able to successfully complete the development of a detection system for Alzheimer's disease that does or does not involve antibodies.

We have concentrated a substantial portion of our research and development efforts on the treatment and detection of Alzheimer's disease, an area of research that has seen significant failure rates. Further, our product candidates are based on new scientific approaches and novel technology, which makes it difficult to predict the time and cost of product candidate development.

We focus substantially all of our research and development efforts on addressing neurodegenerations, such as Alzheimer's disease. Collectively, efforts by biopharmaceutical companies in the field of neurodegenerative diseases have seen many failures and limited success in drug development. Our future success is highly dependent on the successful development of our product candidates for treating Alzheimer's disease. Developing and, if approved, commercializing our product candidates for treatment of Alzheimer's disease subjects us to many challenges, including obtaining regulatory approval from FDA and other regulatory authorities who have only a limited set of precedents to rely on. We cannot be sure that our approach will yield satisfactory therapeutic products that are safe and effective, scalable, or profitable.

Our Phase 2 clinical studies with simufilam in patients with Alzheimer’s disease are generally not designed to show a statistically meaningful difference in cognition or other health functions between those patients who receive placebo and those who receive drug.

Clinical research data is often analyzed with statistical probability (p-value) to address the question of whether a clinical observation is related to a treatment effect, a random effect or something else. This, in turn, requires a clinical study to incorporate a sufficiently large sample patient population to infer the appropriate statistical analysis. By design, our Phase 2 clinical studies with simufilam generally do not include a sufficiently large patient population to generate statistical probability on measures of cognition or other health functions. This feature may make it difficult for investors to properly interpret whether clinical observations in those Phase 2 studies with simufilam are important or meaningful. Conversely, our clinical studies may generate statistically significant data (i.e., $p < 0.05$) with regard to biomarkers, or other endpoints, that have unknown or no clinical importance. In general, the distinction between statistically significant and clinically meaningful is a complex area of research that continues to evolve and may be subject to differences of opinion among scientists, clinicians and other professionals.

We may encounter difficulties enrolling patients in our clinical studies, and our clinical development activities could thereby be delayed or otherwise adversely affected.

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

- the size and severity of disease in the patient population;
- the patient eligibility criteria defined in the protocol, including biomarker-driven identification and/or certain highly-specific criteria related to stage of disease progression, which may limit the patient populations eligible for our clinical studies to a greater extent than competing clinical studies for the same indication that do not have biomarker-driven patient eligibility criteria;
- the size of the study population required for analysis of the trial’s primary endpoints;
- the design of our study protocol;
- our ability to recruit clinical study investigators with the appropriate competencies and experience;
- competing clinical studies for similar therapies or targeting patient populations meeting our patient eligibility criteria;
- clinicians’ and patients’ perceptions as to the potential advantages and side effects of the product candidate being studied in relation to other available therapies and product candidates;
- our ability to obtain and maintain patient consents;
- physicians’ patient referral practices that are out of our control;
- our ability to adequately monitor patients and their caregivers during and after treatment; and
- the risk that patients enrolled in clinical studies will not complete such studies, for any reason.

Our clinical studies may fail to demonstrate substantial evidence of the safety and efficacy of our product candidates, which would prevent, delay, or limit the scope of regulatory approval and commercialization.

Before obtaining regulatory approvals for any of our product candidates, we must demonstrate through lengthy, complex, and expensive preclinical experiments and clinical studies that our product candidates are both safe and effective for use in an intended population. Each product candidate must demonstrate an adequate risk versus benefit profile in its intended patient population and for its intended use.

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 clinical study process. The results of preclinical studies of our product candidates may not be predictive of the results of early-stage or later-stage clinical studies, and results of early clinical studies of our product candidates may not be predictive of the results of later-stage clinical studies. The results of clinical studies in one set of patients or disease indications may not be predictive of those obtained in another. In some instances, there can be significant variability in safety or efficacy results between different clinical studies of the same product candidate due to numerous factors, including changes in study procedures set forth in protocols, differences in the size and type of the patient populations, changes in and adherence to the dosing regimen, and other clinical study protocols and the rate of dropout among clinical study participants.

Open-label extension studies may also extend the timing and cost of a clinical study substantially. Product candidates in later stages of clinical studies may fail to show the desired safety and efficacy profile despite having progressed through preclinical studies and initial clinical studies. Many companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical studies due to lack of efficacy or unacceptable safety issues, notwithstanding promising results in earlier studies. This is particularly true in neurodegenerative diseases, where failure rates historically have been higher than in many other disease areas. Most product candidates that begin clinical studies are never approved by regulatory authorities for commercialization.

We have limited experience in designing clinical studies in neurodegeneration and may be unable to design and execute a clinical study to support marketing approval. We cannot be certain that our current clinical studies or any other future clinical studies will be successful. Additionally, any safety concerns observed in any one of our clinical studies in our targeted indications could limit the prospects for regulatory approval of our product candidates in those and other indications, which could have a material adverse effect on our business, financial condition, and results of operations.

In addition, even if such clinical studies are successfully completed, we cannot guarantee that FDA or foreign regulatory authorities will interpret the results as we do, and more studies could be required before we submit our product candidates for approval. To the extent that the results of the studies are not satisfactory to 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 studies 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 candidates, which may also limit its commercial potential.

If our drug candidate causes or contribute to a death or a serious injury before or after approval, we will be subject to medical reporting regulations, which can result in voluntary corrective actions or agency enforcement actions.

Our drug candidate in Alzheimer's disease is aimed at frail, elderly patients who are in a state of cognitive decline. Under FDA medical reporting regulations, we are required to report to the FDA information that our drug candidate has or may have caused or contributed to a death or serious injury. Any such serious adverse event involving our drug could result in future FDA action, such as an inspection, enforcement action or warning, or in more serious cases, a complete shutdown of our clinical program. In the context of our ongoing clinical trials, we report adverse events to the FDA in accordance with applicable national and local regulations. Any corrective action, whether voluntary or involuntary, and either pre- or post-market, needed to address any serious adverse events will require the dedication of our time and capital, distract management from operating our business, and may harm our reputation and financial results.

The market opportunities for simufilam and SavaDx, if approved, may be smaller than we anticipate.

If our clinical development programs succeed, we expect to seek regulatory approval of simufilam and SavaDx for patients with Alzheimer's disease. Our projections of the number of patients with Alzheimer's disease is based on our beliefs and estimates. These estimates have been derived from a variety of outside sources, including scientific literature, patient foundations and market research, and may prove to be incorrect. The actual number of patients may turn out to be lower than expected. Additionally, the potential patient population for our current programs or future product candidates may be limited. Even if we obtain significant market share for any product candidate, if approved, if the potential target populations are smaller than anticipated, we may never achieve profitability without obtaining marketing approval for additional indications.

We face significant competition in an environment of rapid technological and scientific change, and there is a possibility that additional competitors may achieve regulatory approval before us or develop therapies that are safer, more advanced, or more effective than ours, any of which may harm our business operations.

Drug discovery and development is highly competitive. Moreover, the neurodegenerative field is characterized by intense and increasing competition, and a strong emphasis on intellectual property. We may face competition with respect to any of our product candidates that we seek to develop or commercialize in the future from major pharmaceutical companies, specialty pharmaceutical companies, and biotechnology companies worldwide. Potential competitors also include academic institutions, government agencies, and other public and private research organizations that conduct research, seek patent protection, and establish collaborative arrangements for research, development, manufacturing, and commercialization.

In addition to Biogen and Eli Lilly, several large pharmaceutical and biotechnology companies are currently pursuing the development of products for the treatment of neurodegenerative diseases, including Alzheimer's disease. Many of these current or potential competitors, either alone or with their strategic partners, have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical studies, obtaining regulatory approvals, and marketing approved products than we do.

Our commercial opportunity could be reduced or eliminated if other competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient, or are less expensive than any products that we may develop. Furthermore, currently approved products could be discovered to have application for treatment of neurodegenerative disease indications, which could give such products significant advantages over any of our product candidates. Competitors other than Biogen 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 example, Eli Lilly, a large pharmaceutical company, announced it plans to petition the FDA for accelerated approval of donanemab, its monoclonal antibody drug candidate for the proposed treatment of Alzheimer's disease. Additionally, products or technologies developed by our competitors may render our potential product candidates uneconomical or obsolete, and we may not be successful in marketing any product candidates we may develop against competitors.

In addition, we could face litigation or other proceedings with respect to the scope, ownership, validity, and/or enforceability of our patents relating to our competitors' products and our competitors may allege that our products infringe, misappropriate, or otherwise violate their intellectual property. The availability of our competitors' products could limit the demand, and the price we are able to charge, for any products that we may develop and commercialize.

Risks Related to Government Regulation and Other Legal Compliance Matters

Our financial condition and operating results could be adversely impacted by unfavorable results of legal proceedings, government investigations or allegations and other claims.

We are subject to various claims, legal proceedings and government investigations that have arisen in the ordinary course of business and have not yet been fully resolved, and new matters may arise in the future.

We are currently managing U.S. government inquiries, as well as civil claims under federal and state laws, relating to and/or arising out of our disclosures regarding our research and development of simufilam. New claims or inquiries may arise in the future. Regardless of the merit of particular claims and inquiries, defending against litigation or responding to government investigations is expensive, time-consuming, disruptive to our operations and distracting to management. In recognition of these considerations, we may enter into agreements or other arrangements to settle such matters and resolve such challenges. No assurance can be given that such agreements can be obtained on acceptable terms or that litigation will not occur.

The outcome of legal proceedings, academic inquiries or government investigations is inherently uncertain. If one or more such matters were resolved against us, our financial condition and operating results could be materially adversely affected. Further, such an outcome could result in significant compensatory, punitive or trebled monetary damages, disgorgement of revenue or profits, remedial corporate measures or injunctive relief against us, all of which could materially adversely affect our financial condition and operating results.

While we maintain insurance coverage for certain types of claims, such insurance coverage may be insufficient to cover all losses or all types of claims that may arise.

Additional future litigation against us could be costly and time-consuming to defend.

Innovative drug development is highly litigious, and we may become subject, from time to time, to additional legal proceedings, claims and allegations that arise in the ordinary course of business or pursuant to governmental or regulatory enforcement activity. Regardless of merit, any lawsuits against us, individually or in the aggregate, may have a material adverse effect on our business, financial condition, results of operations or cash flows. In addition, any litigation to which we subsequently become a party might result in substantial costs and divert management's attention, time and resources, which

might seriously harm our business, financial condition, results of operations and cash flows. Our insurance policies might not cover such claims, might not provide sufficient payments to cover all of the costs to resolve one or more such claims, and might not continue to be available on terms acceptable to us. In particular, any claim could result in potential liability for us if the claim is outside the scope of the indemnification agreement we have with our third-party partners, or our third-party partners do not abide by the indemnification agreement as required, or the liability exceeds the amount of any applicable indemnification limits or available insurance coverage. A claim brought against us that is uninsured or underinsured could result in unanticipated costs and could have a material adverse effect on our financial condition, results of operations, cash flows or reputation.

If we are ultimately unable to obtain regulatory approval for our product candidates, we will be unable to generate product revenue and our business will be substantially harmed.

The time required to obtain approval by FDA and comparable foreign regulatory authorities is unpredictable, typically takes many years following the commencement of clinical studies, and depends upon numerous factors, including the type, complexity, and novelty of the product candidates involved. In addition, approval policies, regulations, or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions, which may cause delays in the approval or the decision not to approve an application. Regulatory authorities have substantial discretion in the approval process and may refuse to accept any application or may decide that our data are insufficient for approval and require additional preclinical, clinical, or other studies. We have not obtained regulatory approval for any product candidate, including our product candidates aimed at Alzheimer's disease, and it is possible that none of our existing product candidates or any product candidates we may seek to develop in the future will ever obtain regulatory approval.

Applications for our product candidates could fail to receive regulatory approval in an initial or subsequent indication for many reasons, including but not limited to the following:

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

This lengthy approval process, as well as the unpredictability of the results of clinical studies, 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 growth prospects.

Our ability to market and promote our product candidates will be determined and limited by FDA-approved labeling.

The commercial success of our product candidates will depend upon our ability to obtain FDA-approved labeling describing their features. Our failure to achieve FDA approval of product labeling containing such information will prevent us from advertising and promoting the key features of our product candidates in order to differentiate them from other similar products. This would make our products less competitive in the market.

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

We are exposed to the risk of fraud, misconduct, or other illegal activity by our employees, independent contractors, consultants, commercial partners, and vendors. Misconduct by these parties could include intentional, reckless, and negligent conduct that fails to:

- comply with the laws of FDA and other comparable foreign regulatory authorities;
- provide true, complete, and accurate information to FDA and other comparable foreign regulatory authorities;
- comply with manufacturing standards we have established;
- comply with healthcare fraud and abuse laws in the U.S. and similar foreign fraudulent misconduct laws; or
- report financial information or data accurately or to disclose unauthorized activities to us.

Activities subject to laws also involve the improper use of information obtained in the course of patient recruitment for clinical studies, which could result in regulatory sanctions and cause serious harm to our reputation. Further, it is not always possible to identify and deter misconduct by employees and third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with such laws. 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 fines or other sanctions.

If we fail to comply with the complex federal, state, local and foreign laws and regulations that apply to our business, we could suffer severe consequences that could materially and adversely affect our operating results and financial condition.

Our operations are subject to extensive federal, state, local and foreign laws and regulations, all of which are subject to change. These laws and regulations currently include, among other things:

- The Clinical Laboratory Improvement Amendments (CLIA) of 1988, which are United States federal regulatory standards that apply to all clinical laboratory testing performed on humans in the United States, requires that laboratories obtain certification from the federal government, and state licensure laws;
- FDA laws and regulations;
- The Health Insurance Portability and Accountability Act (HIPAA), which imposes comprehensive federal standards with respect to the privacy and security of protected health information and requirements for the use of certain standardized electronic transactions, including penalties for violators, enforcement authority to state attorneys general and requirements for breach notification;
- state laws regulating testing and protecting the privacy of test results, as well as state laws protecting the privacy and security of health information and personal data and mandating reporting of breaches to affected individuals and state regulators;
- the federal anti-kickback law, or the Anti-Kickback Statute, which prohibits knowingly and willfully offering, paying, soliciting, receiving, or providing remuneration, directly or indirectly, in exchange for or to induce either the referral of an individual, or the furnishing, arranging for, or recommending of an item or service that is reimbursable, in whole or in part, by a federal health care program;
- the federal False Claims Act (FCA), which imposes liability on any person or entity that, among other things, knowingly presents, or causes to be presented, a false or fraudulent claim for payment to the federal government;
- the federal Civil Monetary Penalties Law, which prohibits, among other things, the offering or transfer of remuneration to a Medicare or state health care program beneficiary if the person knows or should know it is likely to influence the beneficiary's selection of a particular provider, practitioner, or supplier of services reimbursable by Medicare or a state health care program, unless an exception applies;
- other federal and state fraud and abuse laws, such as anti-kickback laws, prohibitions on self-referral, and false claims acts, which may extend to services reimbursable by any third-party payor, including private insurers;
- the federal Physician Payments Sunshine Act, which requires manufacturers to track and report to the federal government certain payments and other transfers of value made to physicians and teaching hospitals and ownership or investment interests held by physicians and their immediate family members;

- Section 216 of the federal Protecting Access to Medicare Act of 2014 (PAMA), which requires applicable laboratories to report private payer data in a timely and accurate manner every three years (and in some cases annually);
- state laws that impose reporting and other compliance-related requirements; and
- similar foreign laws and regulations that will apply to us in foreign countries in which we may choose to operate in the future.

Government agencies may establish and promulgate usage guidelines that could limit the use of our product candidates.

Government agencies, professional and medical societies, and other groups may establish usage guidelines that apply to our product candidates. These guidelines could address such matters as usage and dose, among other factors. Application of such guidelines could limit the clinical use or commercial appeal of our product candidates.

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

During the conduct of clinical trials, study participants report changes in their health to their doctor, including illnesses, injuries and discomforts. Often, it is not possible to determine whether our product candidate caused these conditions. Regulatory authorities may draw different conclusions and may require us to pause our clinical trials or require additional testing to confirm these determinations, if they occur. In addition, we have not yet completed long-term safety studies with simufilam to determine if this product candidate is safe for humans. Adverse events or other undesirable side effects caused by simufilam could cause us or regulatory authorities to interrupt, delay, or halt clinical studies and could result in a more restrictive label or the delay or denial of regulatory approval by FDA or other comparable foreign regulatory authorities. Drug-related side effects could affect patient recruitment, the ability of enrolled patients to complete the study, and/or result in potential claims.

Our insurance policies may be inadequate and potentially expose us to unrecoverable risks.

Although we maintain product liability insurance coverage, such insurance may not be adequate to cover all liabilities that we may incur. We anticipate that we will need to increase our insurance coverage each time we commence a clinical trial and if we successfully commercialize any product candidate. Insurance availability, coverage terms and pricing continue to vary with market conditions. We endeavor to obtain appropriate insurance coverage for insurable risks that we identify; however, we may fail to correctly anticipate or quantify insurable risks, we may not be able to obtain appropriate insurance coverage and insurers may not respond as we intend to cover insurable events that may occur. Conditions in the insurance markets relating to nearly all areas of traditional corporate insurance change rapidly and may result in higher premium costs, higher policy deductibles and lower coverage limits. For some risks, we may not have or maintain insurance coverage because of cost or availability.

We are required to maintain product liability insurance pursuant to certain of our development and commercialization agreements. We may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. A successful product liability claim or series of claims brought against us could adversely affect our results of operations, business, and reputation. In addition, regardless of merit or eventual outcome, product liability claims may result in impairment of our business reputation, withdrawal of clinical study participants, costs due to related litigation, distraction of management's attention from our primary business, initiation of investigations by regulators, substantial monetary awards to patients or other claimants, the inability to commercialize our product candidates, and decreased demand for our product candidates, if approved for commercial sale.

If our product candidates receive regulatory approval, we and our collaborators will be subject to ongoing FDA obligations and continued regulatory review, such as continued safety reporting requirements, and we and our collaborators may also be subject to additional FDA post-marketing obligations or new regulations, all of which may result in significant expense and limit our and our collaborators' ability to commercialize our potential drugs.

Any regulatory approvals that our product candidates receive may also be subject to limitations on the indicated uses for which the drug may be marketed or contain requirements for potentially costly post-marketing follow-up studies. In addition,

if FDA approves any of our product candidates, the labeling, packaging, adverse event reporting, storage, advertising, promotion and record keeping for the drug will be subject to extensive regulatory requirements. The subsequent discovery of previously unknown problems with the drug, including but not limited to adverse events of unanticipated severity or frequency, or the discovery that adverse events previously observed in preclinical research or clinical studies that were believed to be minor actually constitute much more serious problems, may result in restrictions on the marketing of the drug, and could include withdrawal of the drug from the market.

The FDA's policies may change, and additional government regulations may be enacted that could prevent or delay regulatory approval of our product candidates. We cannot predict the likelihood, nature or extent of adverse government regulation that may arise from future legislation or administrative action, either in the U.S. or abroad. If we are not able to maintain regulatory compliance, we may be subject to fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution. Any of these events could prevent us from marketing our products and our business could suffer.

Enacted and future legislation may increase the difficulty and cost for us to commercialize our product candidates and may reduce the prices we are able to obtain for our product candidates.

Legislative and regulatory changes and future changes regarding the healthcare system could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities or affect our ability to profitably sell any product candidates for which we obtain marketing approval.

In the U.S., the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (the Medicare Modernization Act) established the Medicare Part D program and provided authority for limiting the number of drugs that will be covered in any therapeutic class thereunder. The Medicare Modernization Act, including its cost reduction initiatives, could limit the coverage and reimbursement rate that we receive for any of our approved products. Private payors may follow Medicare coverage policies and payment limitations in setting their own reimbursement rates resulting in similar limits in payments from private payors.

The Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the Affordable Care Act, among other things, imposes a significant annual fee on companies that manufacture or import branded prescription product candidates. It also contains substantial provisions intended to, among other things, broaden access to health insurance, reduce or constrain the growth of health care spending, enhance remedies against healthcare fraud and abuse, add new transparency requirements for the healthcare and health insurance industries, and impose additional health policy reforms, any of which could have a material adverse effect on our business. A significant number of provisions are not yet, or have only recently become, effective, but the Affordable Care Act may result in downward pressure on pharmaceutical pricing, especially under the Medicare program, and may also increase our regulatory burdens and operating costs.

The Affordable Care Act, as well as other healthcare reform measures that have been and 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, and could seriously harm our future revenues. 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 compromise our ability to generate revenue, attain profitability or commercialize our products.

The Affordable Care Act is a highly complex piece of legislation that continues to evolve. We do not and cannot understand or anticipate the full impact and potential implications of the Affordable Care Act on our business or on our drugs.

Our relationships with customers and payors will be subject to applicable anti-kickback, fraud and abuse, transparency, and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, exclusion from government healthcare programs, contractual damages, reputational harm, administrative burdens, and diminished profits and future earnings.

Healthcare providers, physicians and payors play a primary role in the recommendation and prescription of any product candidates for which we may obtain marketing approval. Our future arrangements with 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 any product candidates for which we may obtain marketing approval. Even though we do not and will not control referrals of healthcare services or bill directly to Medicare, Medicaid or other third-party payors, federal and state healthcare laws and regulations pertaining to fraud and abuse and patients' rights are and will be applicable to our business. Restrictions under applicable federal, state and foreign healthcare laws and regulations may affect our ability to operate and expose us to areas of risk, including:

- the federal Anti-Kickback Statute, which prohibits, among other things, knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under federal and state healthcare programs such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- the FCA, which imposes criminal and civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government. In addition, the government may assert that a claim including items and services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the FCA;
- HIPAA, which imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters. Similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute to defraud any healthcare benefit program or specific intent to violate it in order to have committed a violation;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 and its implementing regulations, which also imposes obligations on certain covered entity healthcare providers, health plans, and healthcare clearinghouses as well as their business associates that perform certain services involving the use or disclosure of individually identifiable health information, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- federal laws requiring drug manufacturers to report information related to payments and other transfers of value made to physicians and other healthcare providers, as well as ownership or investment interests held by physicians and their immediate family members, including under the federal Open Payments program, commonly known as the Sunshine Act, as well as other state and foreign laws regulating marketing activities; and
- state and foreign equivalents of each of the above laws, including state anti-kickback and false claims laws, which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental payors, including private insurers; state laws which 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 restricting payments that may be made to healthcare providers; 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 often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. Nonetheless, it is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion from participation in government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations.

A recent federal court ruling may mandate significant new disclosure requirements for clinical data dating back over a decade which may lead to costly or burdensome disclosures.

A federal court ruling may require all clinical study sponsors to report a decade's worth of previously exempted clinical study data to the federal government for publication on ClinicalTrials.gov. In February 2020, the U.S. District Court for the Southern District of New York invalidated a prior interpretation of NIH regulations that had exempted many clinical studies conducted between 2007 and 2017 from reporting requirements mandated by the Food and Drug Administration Amendments Act. If this court ruling takes effect without appeal, or if it is upheld on appeal, it could require us to submit an onerous amount of old clinical data to the federal government. In many cases, we were the responsible party for generating such clinical data, but such prior data may be difficult or not feasible for us to access as a result of our strategic shift away from analgesic drug development in 2019. We may no longer have control over, or access to, prior clinical data that we may legally be required to report to NIH in the future. Furthermore, it is unclear whether such new disclosure requirements apply to inactive, failed or abandoned drug development programs. As a result of these uncertainties, the government's recent ruling may leave us in a conflicted position or out of compliance with new disclosure requirements. We currently do not and cannot understand or anticipate the full impact and potential implications of this court ruling on our business.

Risks Related to Our Intellectual Property

If we are unable to obtain and maintain sufficient patent protection for any product candidates we develop, our competitors could develop and commercialize products similar or identical to ours, and our ability to successfully commercialize any product candidates we may develop may be adversely affected.

Our success depends in large part on our ability to obtain and maintain patent protection in the U.S. and other countries with respect to our proprietary product candidates and other technologies we may develop. We seek to protect our proprietary position by filing patent applications in the U.S. and abroad relating to our core programs and product candidates, as well as other technologies that are important to our business. Given that our product candidates are in early or clinical stages of development, our intellectual property portfolio with respect to certain aspects of our product candidates is also at an early stage. For example, we have filed or intend to file patent applications on aspects of our technology and core product candidates; however, there can be no assurance that any such patent applications will issue as granted patents. Furthermore, in some cases, we have only filed provisional patent applications on certain aspects of our technology and product candidates and each of these provisional patent applications is not eligible to become an issued patent until, among other things, we file a non-provisional patent application within 12 months of the filing date of the applicable provisional patent application. Any failure to file a non-provisional patent application within this timeline could cause us to lose the ability to obtain patent protection for the inventions disclosed in the associated provisional patent applications.

Furthermore, in some cases, we may not be able to obtain issued claims covering compositions relating to our core programs and product candidates, as well as other technologies that are important to our business, and instead may need to rely on filing patent applications with claims covering a method of use and/or method of manufacture for protection of such core programs, product candidates, and other technologies. There can be no assurance that any such patent applications will issue as granted patents, and even if they do issue, such patent claims may be insufficient to prevent third parties, such as our competitors, from utilizing our technology. Any failure to obtain or maintain patent protection with respect to our core programs and product candidates could have a material adverse effect on our business, financial condition, results of operations, and growth prospects.

U.S. intellectual property rights around diagnostic methods is a complex, evolving area of law and effective patent claims may not be available to us for our investigational diagnostic product candidate, SavaDx, in the United States.

The legal system for intellectual property around diagnostic methods is highly complex, remains uncertain and continues to evolve. In the U.S., patent courts have struggled to define a clear means of patent eligibility for modern age diagnostics. Case law interpretations from the U.S. Supreme Court has left certain important scientific advances in the area of diagnostics without effective patent claims. In 2012, the Supreme Court held that a simple process involving correlations between blood test results and patient health is not eligible for patent claims because such processes incorporate "laws of nature". Since then, different outcomes from different courts, including Federal Circuit, district court and Patent Trial and Appeal Board decisions, have continued to create a sometimes vague or conflicting legal framework for determining the eligibility of patent claims for diagnostic methods. As a result, we cannot be certain how SavaDx fits into the current U.S. legal framework for obtaining

effective patent claims. We currently have no U.S. patents or patent applications with respect to SavaDx, and we believe it may only be protected in the United States by trade secrets, know-how and other proprietary rights technology. Furthermore, claims for diagnostic methods can be complicated to enforce. For patent infringement to occur with a protected diagnostic, the patented method must generally either be performed by one person in its entirety or performed by multiple parties all under the control or direction of a single party. Accordingly, even if effective patent claims are issued for SavaDx, it may be impractical, impossible or even undesirable to enforce potential infringement claims.

Issued patents covering our product candidates and other technologies could be found invalid or unenforceable if challenged in court or before administrative bodies in the U.S. or abroad.

If we initiated legal proceedings against a third party to enforce a patent covering our product candidates or other technologies, the defendant could counterclaim that such patent is invalid or unenforceable. In patent litigation in the U.S., defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. Third parties may raise claims challenging the validity or enforceability of our patents before administrative bodies in the U.S. or abroad, even outside the context of litigation. Such mechanisms include re-examination, post-grant review, inter partes review, interference proceedings, derivation proceedings, and equivalent proceedings in foreign jurisdictions (e.g., opposition proceedings). Such proceedings could result in the revocation of, cancellation of, or amendment to our patents in such a way that they no longer cover our product candidates or other technologies. 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 or our licensing partners 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 product candidates or other technologies. Such a loss of patent protection would have a material adverse impact on our business, financial condition, results of operations, and growth prospects.

If we do not obtain patent term extension and data exclusivity for any product candidates we may develop, our business may be materially harmed.

Depending upon the timing, duration, and specifics of any FDA marketing approval of any product candidates we may develop, one or more of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984 (Hatch-Waxman Act). The Hatch-Waxman Act permits a patent term extension of up to five years as compensation for patent term lost during 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, only one patent may be extended and only those claims covering the approved drug, a method for using it, or a method for manufacturing it may be extended. Similar extensions as compensation for patent term lost during regulatory review processes are also available in certain foreign countries and territories, such as in Europe under a Supplementary Patent Certificate. However, we may not be granted an extension in the U.S. and/or foreign countries and territories because of, for example, failing to exercise due diligence during the testing phase or regulatory review process, 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 a patent term extension or the term of any such extension is shorter than what we request, our competitors may obtain approval of competing products following our patent expiration, and our business, financial condition, results of operations, and growth prospects could be materially harmed.

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

In addition to seeking patents for our product candidates and other technologies, we also rely on trade secrets and confidentiality agreements to protect our unpatented know-how, technology, and other proprietary information and to maintain our competitive position. We consider trade secrets and know-how to be one of our primary sources of intellectual property. Trade secrets and know-how can be difficult to protect. We expect our trade secrets and know-how to over time be disseminated within the industry through independent development, the publication of journal articles describing the methodology, and the movement of personnel from academic to industry scientific positions.

We seek to protect these trade secrets and other proprietary technology, in part, by entering into non-disclosure and confidentiality agreements with parties who have access to them, such as our employees, corporate collaborators, outside scientific collaborators, CROs, CDMOs, consultants, advisors, and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants as well as train our employees not to bring or use proprietary information or technology from former employers to us or in their work, and remind former employees when they leave their employment of their confidentiality obligations. We cannot guarantee that we have entered into such agreements with each party that may have or have had access to our trade secrets or proprietary technology and processes. Despite our efforts, 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 U.S. are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor or other third party, we would have no right to prevent them from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor or other third party, our competitive position would be materially and adversely harmed.

If any of our patent applications do not issue as patents in any jurisdiction, we may not be able to compete effectively.

Changes in either the patent laws or their interpretation in the U.S. and other countries may diminish our ability to protect our inventions, obtain, maintain, and enforce our intellectual property rights and, more generally, could affect the value of our intellectual property or narrow the scope of our patents with respect to our product candidates. With respect to our intellectual property related to our product candidates, we cannot predict whether the patent applications we are currently pursuing will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provide sufficient protection from competitors or other third parties.

The patent prosecution process is expensive, time-consuming, and complex, and we may not be able to file, prosecute, maintain, or enforce all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output in time to obtain patent protection. Although we enter into nondisclosure and confidentiality agreements with parties who have access to confidential or patentable aspects of our research and development output, such as our employees, outside scientific collaborators, CROs, CDMOs, consultants, advisors, and other third parties, any of these parties may breach the agreements and disclose such output before a patent application is filed, thereby jeopardizing our ability to seek patent protection. In addition, our ability to obtain and maintain valid and enforceable patents depends on whether the differences between our inventions and the prior art allow our inventions to be patentable. Furthermore, publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the U.S. and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot be certain that we were the first to make the inventions claimed in any of our patents or pending patent applications, or that we were the first to file for patent protection of such inventions.

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 technology and product candidates would be adversely affected.

The patent position of biotechnology and pharmaceutical 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 may not result in patents being issued which protect our product candidates or other technologies or which effectively prevent others from commercializing competitive technologies and 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 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 to which we have rights may be challenged, narrowed, circumvented, or invalidated by third parties. Consequently, we do not know whether product candidates or other technologies will be protectable or remain protected by valid and enforceable patents. Our competitors or other third parties may be able to circumvent our patents 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 growth prospects.

The issuance of a patent is not conclusive as to its inventorship, scope, validity, or enforceability, and our patents may be challenged in the courts or patent offices in the U.S. and abroad. We may be subject to a third-party pre-issuance submission of prior art to the United States Patent and Trademark Office (USPTO) or become involved in opposition, derivation, revocation, reexamination, post-grant and *inter partes* review, or interference proceedings 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, such patent rights, allow third parties to commercialize our product candidates or other technologies 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, we may have to participate in interference proceedings declared by the USPTO to determine priority of invention or in post-grant challenge proceedings, such as oppositions in a foreign patent office, that challenge our priority of invention or other features of patentability with respect to our patents and patent applications. 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 or identical technology and products, or limit the duration of the patent protection of our product candidates and other technologies. 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. If we are unsuccessful in any such proceeding or other priority or inventorship dispute, we may be required to obtain and maintain licenses from third parties, including parties involved in any such interference proceedings or other priority or inventorship disputes. Such licenses may not be available on commercially reasonable terms or at all or may be non-exclusive. If we are unable to obtain and maintain such licenses, we may need to cease the development, manufacture, and commercialization of one or more of the product candidates we may develop. The loss of exclusivity or the narrowing of our owned and licensed patent claims could limit our ability to stop others from using or commercializing similar or identical technology and products.

In addition, given the amount of time required for the development, testing, and regulatory review of new product candidates, patents protecting such product candidates might expire before or shortly after such product 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.

We may not be able to protect our intellectual property and proprietary rights throughout the world.

Filing, prosecuting, and defending patents on our product candidates and other technologies in all countries throughout the world would be prohibitively expensive, and the laws of foreign countries may not protect our rights to the same extent as the laws of the U.S.

Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the U.S., or from selling or importing products made using our inventions in and into the U.S. or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products, and, further, may export otherwise infringing products to territories where we have patent protection, but enforcement is not as strong as that in the U.S. These products may compete with our products, and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets, and other intellectual property protection, particularly those relating to biotechnology products, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our intellectual property and proprietary rights generally. Proceedings to enforce our intellectual property and proprietary 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 at risk of being invalidated or interpreted narrowly, could put our patent applications 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 and proprietary rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment, and other requirements imposed by government 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 government fees on patents and applications will be due to be paid to the USPTO and various government patent agencies outside of the U.S. over the lifetime of our owned or licensed patents and applications. The USPTO and various non-U.S. government agencies require compliance with several procedural, documentary, fee payment, and other similar provisions during the patent application process. In some cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. There are situations, however, in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in a partial or complete loss of patent rights in the relevant jurisdiction. In such an event, potential competitors might be able to enter the market with similar or identical products or technology, which could have a material adverse effect on our business, financial condition, results of operations, and growth prospects.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing our ability to protect our products.

Changes in either the patent laws or interpretation of the patent laws in the U.S. could increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of issued patents. Assuming that other requirements for patentability are met, prior to March 2013, in the U.S., the first to invent the claimed invention was entitled to the patent, while outside the U.S., the first to file a patent application was entitled to the patent. After March 2013, under the Leahy-Smith America Invents Act (the America Invents Act) enacted in September 2011, the U.S. transitioned to a first inventor to file system in which, assuming that other requirements for patentability are met, the first inventor to file a patent application will be entitled to the patent on an invention regardless of whether a third party was the 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. Since patent applications in the U.S. and most other countries are confidential for a period of time after filing or until issuance, we cannot be certain that we were the first to either (i) file any patent application related to our product candidates or other technologies or (ii) invent any of the inventions claimed in our patents or patent applications.

The America Invents Act also includes a number of significant changes that affect the way patent applications will be prosecuted and also may affect patent litigation. These include allowing third party submission of prior art to the USPTO during patent prosecution and additional procedures to attack the validity of a patent by USPTO administered post-grant proceedings, including post-grant review, *inter partes* review, and derivation proceedings. Because of a lower evidentiary standard in USPTO proceedings as compared to the evidentiary standard in U.S. 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. Therefore, the America Invents Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business, financial condition, results of operations, and growth prospects.

In addition, the patent positions of companies in the development and commercialization of pharmaceuticals are particularly uncertain. Various U.S. Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. This combination of events has created uncertainty with respect to the validity and enforceability of patents, once obtained. Depending on future actions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that could have a material adverse effect on our existing patent portfolio and our ability to protect and enforce our intellectual property in the future.

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

We may be subject to claims that former employees, scientific collaborators or other third parties have an interest in our patents, trade secrets, or other intellectual property as an inventor or co-inventor. For example, we may have inventorship

disputes arise from conflicting obligations of employees, consultants, or others who are involved in developing our product candidates or other technologies. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership of our patents, trade secrets, or other intellectual property. If the defense of any such claims fails, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, intellectual property that is important to our product candidates and other technologies. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations, and growth prospects.

We may not be successful in obtaining necessary rights to our product candidates or other technologies.

Many pharmaceutical companies, biotechnology companies, and academic institutions that compete with us in the field of neurodegeneration therapy may have patents filed and are likely filing patent applications potentially relevant to our business. In order to avoid infringing these third-party patents, we may find it necessary or prudent to obtain licenses to such patents from such third-party intellectual property holders. We may also require licenses from third parties for certain technologies for use with future product candidates. In addition, with respect to any patents we co-own with third parties, we may wish to obtain licenses to such co-owner's interest to such patents. However, we may be unable to secure such licenses or otherwise acquire any compositions, methods of use, processes, or other intellectual property rights from third parties that we identify as necessary for our future product candidates. The licensing or acquisition of third-party intellectual property rights is a competitive area, and several more established companies may pursue strategies to license or acquire third-party intellectual property rights that we may consider attractive or necessary. These established companies may have a competitive advantage over us due to their size, capital resources, and greater clinical development and commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. 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 rights or 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 growth prospects.

We may be subject to claims that our employees, consultants, or advisors have wrongfully used or disclosed alleged trade secrets of their current or former employers or claims asserting ownership of what we regard as our own intellectual property which may prevent or delay the development of our product candidates.

The field of developing innovations for neurodegenerative diseases is highly competitive and dynamic. Due to the focused research and development that is taking place by several companies, including us and our competitors, the intellectual property landscape in this field is in flux, and it may remain uncertain in the future. Additionally, no products utilizing our underlying science and technology have yet reached the market. As such, there may be significant intellectual property related litigation and proceedings relating to our, and other third party, intellectual property and proprietary rights in the future.

Many of our employees, consultants, and advisors are currently or were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors and potential competitors. Although we try to ensure that our employees, consultants, and advisors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or these individuals have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such individual's current or former employer. 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. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management.

In addition, while it is our policy to require our employees and contractors who may be involved in the conception or development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who, in fact, conceives or develops intellectual property that we regard as our own. The assignment of intellectual property rights may not be self-executing, or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property. Such claims could have a material adverse effect on our business, financial condition, results of operations, and growth prospects.

Our commercial success depends in part on our ability to develop, manufacture, market, and sell any product candidates that we develop and to use our proprietary technologies without infringing, misappropriating, and otherwise violating the patents and other intellectual property rights of third parties. There is a substantial amount of complex litigation involving patents and other intellectual property rights in the biotechnology and pharmaceutical industries, as well as administrative proceedings for challenging patents, including interference, derivation, and reexamination proceedings before the USPTO or oppositions and other comparable proceedings in foreign jurisdictions. We may become party to, or threatened with, such actions in the future, regardless of their merit. As discussed above, recently, due to changes in U.S. law referred to as patent reform, new procedures including *inter partes* review and post-grant review have been implemented. As stated above, this reform adds uncertainty to the possibility of challenge to our patents in the future.

Numerous U.S. and foreign issued patents and pending patent applications owned by third parties exist in the fields in which we are developing our product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates and other technologies may give rise to claims of infringement of the patent rights of others. Although we believe that we do not infringe on any third parties' patents or other intellectual property, we cannot assure you that our product candidates and other technologies that we have developed, are developing or may develop in the future will not infringe existing or future patents owned by third parties. We may not be aware of patents that have already been issued to a third party, such as a competitor in the fields in which we are developing product candidates, who might assert infringement of patents it may hold by our current or future product candidates or other technologies, including claims to compositions, formulations, methods of manufacture or methods of use or treatment that cover our product candidates or other technologies. It is also possible that patents owned by third parties of which we are aware, but which we do not believe are relevant to our product candidates or other technologies, could be found to be infringed by our product candidates or other technologies. In addition, 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 or other technologies may infringe.

Engaging in litigation to defend against third parties alleging that we have infringed, misappropriated, or otherwise violated their patents or other intellectual property rights is very expensive, particularly for a company of our size, and time-consuming. Some of our competitors may be able to sustain the costs of litigation or administrative proceedings more effectively than we can because of greater financial resources. Patent litigation and other proceedings may also absorb significant management time. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings against us could impair our ability to compete in the marketplace. The occurrence of any of the foregoing could have a material adverse effect on our business, financial condition, results of operations, and growth prospects.

We may become involved in lawsuits to protect or enforce our patents and other intellectual property rights, which could be expensive, time consuming, and unsuccessful.

Competitors may infringe on our patents or the patents of our licensing partners, or we may be required to defend against claims of infringement. In addition, our patents or the patents of our licensing partners also may become involved in inventorship, priority, or validity disputes. To counter or defend against such claims can be expensive and time consuming. In an infringement proceeding, a court may decide that a patent in which we have an interest is invalid or unenforceable, the other party's use of our patented technology falls under the safe harbor to patent infringement, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated or interpreted narrowly. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation.

Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses and could distract our 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 and more mature and developed intellectual property portfolios. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

Intellectual property rights do not necessarily address all potential threats.

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 make products that are similar to our product candidates or utilize similar technology but that are not covered by the claims of the patents that we may own;
- we might not have been the first to make the inventions covered by the issued patent or pending patent application that we own now or in the future;
- we 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 owned intellectual property rights;
- it is possible that our current or future pending patent applications will not lead to issued patents;
- issued patents that we hold rights to may be held invalid or unenforceable, including as a result of legal challenges by our competitors or other third parties;
- our competitors or other third parties 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 harm 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, they could have a material adverse effect on our business, financial condition, results of operations, and growth prospects.

Risks Related to Our Business and Operations

Our reputation and operations could be adversely impacted by allegations, regardless of their merits.

We believe that our reputation has significantly contributed to the success of our business. We also believe that maintaining and enhancing our reputation is critical to many of our core operations, such as conducting studies, working with outside vendors, hiring qualified employees, members of our Board of Directors or science collaborators, raising funds for future operations, or working with potential industry and government collaborators. Maintaining and enhancing our reputation will depend largely on our ability to develop innovative drug products, continue to generate credible scientific data and respond appropriately to our critics, which we may not do successfully.

Our reputation may be injured by published false statements purporting to be fact, or by hostile actions made by or paid for by parties who represent investors who seek a decline in the price of our securities (“short-sellers”). Such allegations and statements may be published on internet forums over which we have no control, such as social media, and may be adopted by the editors of scientific or technical journals that have published our research, potentially resulting in retractions or expressions of concern by the journals. Regardless of merit, allegations and false statements may spread quickly and erode confidence in our reputation. Maintaining and enhancing our reputation may require us to make substantial investments in legal actions or other activities, and these investments could be expensive, time consuming, and unsuccessful. If we fail to successfully maintain our reputation, or if we incur excessive expenses in this effort, our business, operations, future prospects, cash flows, and financial position may be adversely affected.

Our ability to continue to operate without any significant disruptions will in part depend on our ability to source raw materials and clinical supplies via our product supply chains.

The widespread outbreak of COVID-19 has generally not significantly impacted our ability to source raw materials and clinical supplies to date. However, we are broadly aware of some general supply chain disruptions in certain markets due primarily to the restriction of employee movements and, in North America, due to labor shortages, supply chain disruptions and transportation constraints. In addition, uncertainty in the duration and scope of the pandemic, the emergence of new

mutations or variants of the virus, the likelihood of a resurgence of positive cases, the speed at which treatments and vaccines are administered or mandated and governmental actions in response to the pandemic could result in an unforeseen disruption to our operations. In addition, our ability to conduct clinical trials require the use of a host of critical ancillary supplies. Clinical ancillary supplies are general consumable or disposable products, such as sample collection tubes, latex gloves, instruments and other products routinely used in a medical or clinical research setting. We rely on independent vendors globally to supply us or our clinical collaborators with ancillary supplies. Any disruptions, gaps or shortages in the global supply chain for ancillary supplies could increase the cost or complexity of our supply chain management and delay the completion of our Phase 3 clinical program.

We cannot reasonably predict disruptions, gaps or shortages across our product supply-chains. With prolonged disruptions, there exists the possibility of a material adverse impact on our business, clinical operations, future prospects, cash flows, and financial position. Should we be unable to obtain key raw materials and clinical supplies on a timely basis, it could have a material adverse effect on our business, financial condition, results of operations, and growth prospects.

The worldwide outbreak of the COVID-19 virus and associated mutations or variants may materially and adversely affect our business operations and our ability to conduct clinical studies.

A widespread outbreak of COVID-19 has been declared by the World Health Organization to be a “public health emergency of international concern”; a national emergency by the President of the U.S; and a major disaster by several states in which we operate. This unprecedented spread of disease may affect our operations by causing a period of business disruption, including the potential interruption or halt of our clinical study activities and delays or disruptions in the supply of our products and product candidates, or the inability of our employees to continue their normal course of work due to disease, quarantine or leave requirements, or the possibility of legal claims and actions against us for claims of loss arising out of COVID-19. As a small company that operates with a limited number of employees, the impact of disease may disproportionately hurt our operations. Further, our business insurance may not provide coverage against economic loss or claims specifically tied to COVID-19 or any other disease.

COVID-19 presents many challenges that are without precedent. As such, we cannot presently assess or predict all current and potential uncertainties around the scope and severity of COVID-19 on our business operations with any meaningful precision. There is no assurance that COVID-19 will not have a material adverse impact on our future results. For example, the continued spread of COVID-19 could adversely impact our clinical study operations, including our ability to recruit and retain patients and principal investigators and site staff who, as healthcare providers, may have heightened exposure to COVID-19 if an outbreak occurs in their geography. COVID-19 could also negatively affect our manufacturing operations, which could result in delays or disruptions in the supply of our product candidates. A greater number of our employees working remotely during this outbreak of disease may expose us to greater risks related to cybersecurity and cyber-liability. Our study participants, vendors, employees, suppliers or others may allege they became sick due to our negligence. In addition, there could be a potential effect of a slowdown at FDA, which could result in delays of regulatory correspondence that are necessary for us to maintain or advance our product candidates in clinical studies. Further, the COVID-19 outbreak may adversely impact our ability to file on a routine and timely basis our obligations under federal securities laws, present new data at annual scientific meetings and professional conferences, reach out to institutional investors through in-person meetings, advance simufilam in a Phase 3 efficacy program, add an international component to our clinical studies, obtain additional financing as needed, engage in partnering discussions or conduct other activities necessary to the success of our business.

The extent to which the COVID-19 pandemic may impact our business with respect to research and development and clinical trials will depend on future developments, which are highly uncertain and cannot be predicted with confidence, such as the ultimate geographic spread of the disease, vaccine distribution, variants of the virus, the duration of the outbreak, travel restrictions and social distancing in the United States and other countries, business closures or business disruptions, and the effectiveness of actions taken in the United States and other countries to contain and treat the disease. As the COVID-19 pandemic continues to spread around the globe, we will likely experience disruptions that could severely impact our business with respect to research and development and clinical trials, including:

- delays or difficulties in enrolling patients or maintaining scheduled study visits in our clinical trials;
- delays or difficulties in clinical site initiation, including difficulties in recruiting clinical site investigators and clinical site staff;
- negative impact on interactions necessary for clinical testing, due to restricted access for industry employees;

- challenges in providing clinical study education with respect to our Phase 3 program in a virtual setting, and restrictions on clinician and provider travel;
- diversion of healthcare resources, clinical staff, physicians and advanced practice providers in neurology, including clinical sites serving as our clinical trial sites, away from the conduct of our clinical trials;
- interruption of key clinical trial activities, such as clinical trial site monitoring, due to limitations on travel imposed or recommended by federal or state governments, employers and others;
- limitations in employee resources that would otherwise be focused on the conduct of our business with respect to research and development or clinical trials, including due to illness of our employees or their families, an increase in childcare responsibilities for certain employees, the desire of our employees to avoid close contact or contact with large groups of people or because of governmental imposition of stay-at-home orders or similar working restrictions;
- delays in receiving approval from local regulatory authorities to initiate our planned clinical trials;
- delays in clinical sites receiving the supplies and materials needed to conduct clinical trials;
- interruption in domestic or global shipping that may affect the transport of clinical trial materials;
- changes in regulations as part of a response to the COVID-19 pandemic, which may require us to change the ways in which our clinical trials are conducted, which may result in unexpected costs, or discontinuing clinical trials altogether;
- delays in necessary interactions and anticipated timelines with local and federal regulators (including the FDA), ethics committees and other important agencies and contractors due to limitations in employee resources or forced furlough of government employees; and
- refusal of the FDA to accept data from clinical trials in affected geographies outside the United States.

If we or any of the third parties with whom we engage were to experience shutdowns or other business disruptions related to COVID-19, our ability to conduct our business in the manner and on the timelines presently planned could be materially and negatively impacted, which could have a material adverse effect on our business, results of operations and financial condition.

Our dependence on single source suppliers for our drug substance and drug product could materially adversely affect our ability to manufacture our product candidates and materially increase our costs.

We rely on single source suppliers for materials that are critical to the manufacturing of simufilam, our lead product candidate. This reliance subjects us to risks related to our potential inability to obtain an adequate supply of required materials. Our operating results could be materially adversely affected if we were unable to obtain adequate supplies of simufilam in a timely manner or if their cost increased significantly.

Further, it would likely result in production and delivery delays if we needed to find alternative suppliers for simufilam, which could lead to delays in our clinical trials and have a material adverse effect on our business, results of operations and financial condition.

Changes in funding for the FDA and other government agencies could hinder their ability to hire and retain key leadership and other personnel, or otherwise prevent our product candidates from being developed or commercialized in a timely manner, which could negatively impact our business.

We rely on the FDA to assist with the development our product candidates. The ability of the FDA to review and approve new drug products can be affected by a variety of factors outside of our control, 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. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA and other agencies may also slow the time necessary for our product candidates to be reviewed and/or potentially approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, including for 35 days beginning on December 22, 2018, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA employees and stop critical activities. If a prolonged government shutdown occurs, 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. If the timing of FDA's

review and approval of new products is delayed, the estimated timing of our drug development program may be delayed which would materially increase costs of drug development and harm our operations or business.

Our reliance on third parties for both the supply and manufacture of materials for our product candidates carries the risk that we will not have sufficient quality or quantities of such materials or product candidates, or that such supply will not be available to us at an acceptable cost, which could delay, prevent, or impair our development or commercialization efforts.

We do not have any manufacturing facilities. We currently rely on CDMOs for all of the manufacture of our materials for preclinical studies and clinical studies and expect to continue to do so for preclinical studies, clinical studies, and for commercial supply of any product candidates that we may develop. We currently have established relationships with several CDMOs for the manufacturing of our product candidates. We may be unable to establish any further agreements with CDMOs or to do so on acceptable terms. Even if we are able to establish agreements with third-party manufacturers, reliance on CDMOs entails additional risks, including:

- the possible breach of the manufacturing agreement by the third party;
- the possible termination or nonrenewal of the agreement by the third party at a time that is costly or inconvenient for us;
- reliance on the third party for regulatory compliance, quality assurance, safety, and pharmacovigilance and related reporting; and
- the inability to produce required volume in a timely manner and to quality standards.

Third-party manufacturers may not be able to comply with cGMP regulations or similar regulatory requirements outside the U.S. Our failure, or the failure of our CDMOs, to comply with applicable regulations could result in clinical holds on our studies, sanctions being imposed on us, including fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, seizures, or recalls of product candidates or product candidates, operating restrictions, and criminal prosecutions, any of which could significantly and adversely affect supplies of our product candidates and harm our business, financial condition, results of operations, and growth prospects.

Any product candidates that we may develop may compete with other product candidates and products for access to manufacturing facilities. There are a limited number of manufacturers that operate under cGMP regulations and that might be capable of manufacturing for us.

Any performance failure on the part of our existing or future third-party manufacturers could delay clinical development or marketing approval. If any one of our current contract manufacturers cannot perform as agreed, we may be required to replace that manufacturer and may incur added costs and delays in identifying and qualifying any such replacement. Furthermore, securing and reserving production capacity with contract manufacturers may result in significant costs.

We also rely on third-parties for the supply of the raw materials required for the production of our product candidates, and 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. Our current and anticipated future dependence upon others for the manufacture of any product candidates we may develop may adversely affect our future profit margins and our ability to commercialize any medicines that receive marketing approval on a timely and competitive basis.

Our employees, principal investigators, consultants and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements and insider trading.

We are exposed to the risk of fraud or other misconduct by our employees, principal investigators, consultants and vendors. Misconduct by these parties could include intentional failures, reckless and/or negligent conduct or unauthorized activities that violate (i) the laws and regulations of FDA and other regulatory authorities, including those laws requiring the reporting of true, complete and accurate information to such authorities, (ii) manufacturing standards, (iii) federal and state data privacy, security, fraud and abuse and other healthcare laws and regulations in the United States and abroad and (iv) laws that require the true, complete and accurate reporting of financial information or data. In particular, clinical and business arrangements in the biotechnology and healthcare industries are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations restrict or prohibit a wide range of financial arrangements, incentive programs and other business arrangements. Such misconduct also could involve

the improper use of individually identifiable information, including, without limitation, information obtained in the conduct of clinical trials, creating fraudulent data in our preclinical studies or clinical trials or illegal misappropriation of drug product, which could result in regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from government investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations.

Additionally, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us and we are not successful in defending ourselves or asserting our rights, those actions could result in significant civil, criminal and administrative penalties, damages, fines, disgorgement, imprisonment, exclusion from participating in government-funded healthcare programs, such as Medicare and Medicaid, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of noncompliance with these laws, contractual damages, reputational harm and the curtailment or restructuring of our operations, any of which could have a negative impact on our business, financial condition, results of operations and prospects.

We expect to grow the size and capabilities of our organization, including accessing new physical facilities, and we may experience difficulties in effectively managing this growth.

As our development plans and strategies develop, we expect to add a significant number of additional managerial, operational, financial, and other personnel. Future growth will impose significant added responsibilities on members of management, including:

- identifying, recruiting, integrating, retaining, and motivating additional employees;
- executing a planned move to our new corporate headquarters in 2022;
- increasing employee headcount;
- managing our internal development efforts effectively, including the clinical and FDA review process for our current and future product candidates, while complying with our contractual obligations to contractors and other third parties;
- expanding our operational, financial and management controls, reporting systems, and procedures; and
- managing increasing operational and managerial complexity.

Our future financial performance and our ability to continue to develop and, if approved, commercialize our product candidates will depend, in part, on our ability to effectively manage any future growth. Our management may also have to divert a disproportionate amount of its attention away from day-to-day activities in order to manage these growth activities.

We currently rely, and for the foreseeable future will continue to rely, in substantial part on certain independent organizations, advisors, and consultants to provide certain services. There can be no assurance that the services of these independent organizations, advisors, and consultants will continue to be available to us on a timely basis when needed, or that we can find qualified replacements. In addition, if we are unable to effectively manage our outsourced activities or if the quality or accuracy of the services provided by consultants is compromised for any reason, our clinical studies may be extended, delayed, or terminated, and we may not be able to obtain regulatory approval of our product candidates or otherwise advance our business. There can be no assurance that we will be able to manage our existing consultants or find other competent outside contractors and consultants on economically reasonable terms, if at all.

If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, we may not be able to successfully implement the tasks necessary to further develop our product candidates and, accordingly, may not achieve our research, development, and commercialization goals.

Ownership of our corporate headquarters and property leasing are subject to numerous risks and uncertainties.

In August 2021, we made an all-cash purchase of an office complex in Austin, Texas, that we anticipate will serve as our corporate headquarters for the long term. Title to this property is held by Austin Innovation Park, LLC, a Texas limited liability company wholly owned by Cassava Sciences. The purchase required a substantial upfront cash investment and may require further commitments of our resources in the future. We have assumed or entered into lessor commitments with independent third parties for portions of our office complex and will continue to do so in the future. Commercial property ownership and

related leasing activity are subject to many factors that pose substantial financial risks and uncertainties, including tenant default or non-payment of lease obligations by tenants. Macro-economic or other factors outside of our control could have an adverse effect on the demand for leased office space in our locale or may cause a decline in the market value of our corporate headquarters. If we fail to lease unoccupied office space at favorable rates, or if we incur excessive expenses in this effort or incur excessive leasehold improvements or property ownership expenses, our business, operations, future prospects, cash flows, and financial position may be adversely affected.

Our internal computer systems, or those used by third parties on whom we rely, may fail or suffer other breakdowns, cyberattacks, or information security breaches that could compromise the confidentiality, integrity, and availability of such systems and data, result in material disruptions of our development programs and business operations, risk disclosure of confidential, financial, or proprietary information, and affect our reputation.

In the ordinary course of our business, we collect and store sensitive data, including legally protected patient health information, personally identifiable information about our employees, intellectual property, and proprietary business information. We manage and maintain our applications and data utilizing on-site systems. These applications and data encompass a wide variety of business-critical information including research and development information, commercial information and business and financial information. Despite the implementation of security measures, our internal computer systems and those of our current or future Clinical Research Organizations (CROs) and other contractors and consultants may be vulnerable to damage from computer viruses and unauthorized access. As the cyber-threat landscape evolves, these attacks are growing in frequency, sophistication, and intensity, and are becoming increasingly difficult to detect. Such attacks could include the use of key loggers or other harmful and virulent malware, including ransomware or other denials of service, and can be deployed through malicious websites, the use of social engineering, and/or other means. If a breakdown, cyberattack, or other information security breach were to occur and cause interruptions in our operations, it could result in a misappropriation of confidential information, including our intellectual property or financial information, and a material disruption of our development programs and our business operations. For example, the loss of clinical study data from completed, ongoing, or future clinical studies could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. Likewise, we rely on our third-party research institution collaborators for research and development of our product candidates and other third parties for the manufacture of our product candidates and to conduct clinical studies, and similar events relating to their computer systems could also have a material adverse effect on our business. 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 disclosure of confidential, financial, or proprietary information, including data related to our personnel, we could incur liability or risk disclosure of confidential, financial, or proprietary information, and the further development and commercialization of our product candidates could be delayed. There can be no assurance that we and our business counterparties will be successful in efforts to detect, prevent, or fully recover systems or data from all breakdowns, service interruptions, attacks, or breaches of systems that could adversely affect our business and operations and/or result in the loss of critical or sensitive data, which could result in financial, legal, business, or reputational harm to us.

Our business involves environmental risks that may result in liability for us.

In connection with our research and development activities, we, and our collaborators and vendors, are subject to federal, state and local laws, rules, regulations and policies governing the use, generation, manufacture, storage, air emission, effluent discharge, handling and disposal of certain materials, biological specimens, chemicals and wastes. Although we believe that we comply with such applicable laws, regulations and policies in all material respects and have not been required to correct any material noncompliance, we may incur significant costs to comply with environmental and health and safety regulations in the future. Although we believe that our safety procedures for handling and disposing of controlled materials comply with the standards prescribed by state and federal regulations, accidental contamination or injury from these materials may occur. In the event of such an occurrence, we could be held liable for any damages that result and any such liability could exceed our resources.

Business disruptions and lack of appropriate levels of commercial insurance could seriously harm our future revenue and financial condition and increase our costs and expenses.

Our operations, and those of our third-party research institution collaborators, CROs, CDMOs, suppliers, and other contractors and consultants, could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, disease epidemics or pandemics, such as COVID-19, a novel coronavirus first detected in 2019, and other natural or man-made disasters or business interruptions, for which we are partly

or entirely uninsured. In addition, we rely on our third-party research institution collaborators for conducting research and development of our product candidates, and they may be affected by government shutdowns or withdrawn funding. 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.

Our day-to-day operations are located in a single office facility in Austin, Texas. Damage or extended periods of interruption to our corporate, development, or research facilities could cause us to cease or delay development of some or all our product candidates. Our insurance might not cover losses under such circumstances and our business may be seriously harmed by such delays and interruption.

Social media platforms present risks and challenges.

As social media continues to expand, it also presents us with new challenges. The inappropriate or unauthorized use of our confidential information on media platforms could cause brand damage or information leakage, which would cause legal or regulatory issues for us. In addition, negative, inappropriate or inaccurate posts or comments about us or our product candidates on social media internet sites could quickly and irreversibly damage our reputation, brand image and goodwill. Further, the accidental or intentional disclosure of non-public sensitive information by our workforce or others through media channels could lead to information loss or could lead to legal or regulatory issues for us.

We expect to rely on third parties to conduct our studies and some aspects of our research, and such third parties may not perform satisfactorily, which could delay or harm our studies, research, and testing.

We substantially rely and expect to continue to rely on third parties, such as CROs, clinical data management organizations, medical institutions, and clinical investigators, to conduct some aspects of our research and preclinical testing and our clinical studies. Any of these third parties may terminate their engagements with us or be unable to fulfill their contractual obligations. If we need to enter into alternative arrangements, it will delay our product development activities.

Our reliance on these third parties for research and development activities reduces our control over these activities but does not relieve us of our responsibilities. For example, we remain responsible for ensuring that all of our clinical studies are conducted in accordance with the general investigational plan and protocols for the trial. Moreover, FDA requires us to comply with the norms of Good Clinical Practice (GCPs) for conducting, recording, and reporting the results of clinical studies to assure that data and reported results are credible, reproducible, and accurate and that the rights, integrity, and confidentiality of study participants are protected. We also are required to register ongoing clinical studies and post the results of completed clinical studies on a government-sponsored database within certain timeframes. Failure to do so can result in fines, adverse publicity, and civil and criminal sanctions.

If our third-party vendors do not successfully carry out their contractual duties, meet expected deadlines, or conduct studies in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, marketing approvals for any product candidates we may develop and will not be able to, or may be delayed in our efforts to, successfully commercialize our product candidates. For example, one of our vendors failed to fully comply with certain Good Laboratory Practice (GLP) norms in its research facility, which required us to repeat a lab study at a different research site.

We also rely on other third parties to label, store and distribute drug supplies for our clinical studies. Any performance failure on the part of our distributors, including with the shipment of any drug supplies, could delay clinical development or marketing approval of any product candidates we may develop or commercialization of our product candidates, producing additional losses and depriving us of potential product revenue.

We do not own any manufacturing facilities and we rely on third-party commercial drug manufacturers for clinical drug supply.

We do not own any manufacturing facilities. We plan to continue to outsource formulation, manufacturing and related activities. We rely on a limited number of third-party suppliers to formulate, manufacture, fill, label, ship or store all of our product candidates. These suppliers must comply with current cGMP regulations enforced by FDA and other government

agencies, and are subject to ongoing periodic unannounced inspection, including preapproval inspections by FDA and corresponding state and foreign government agencies to ensure strict compliance with cGMP and other government regulations and corresponding foreign standards. These manufacturers may subsequently be stopped from producing, storing, shipping or testing our drug products due to their non-compliance with federal, state or local regulations. We do not have control over our suppliers' compliance with these regulations and standards. We cannot control decisions by our suppliers that affect their ability or willingness to continue to supply us on acceptable terms, or at all. We may not be able to replace a commercial supplier on commercially reasonable terms, or at all. Replacing any of our commercial suppliers would be expensive and time consuming. Failure by any of our suppliers to perform as expected could delay or prevent commercialization of our product candidates or result in shortages, cost overruns, or other problems and would materially harm our business.

We are a small company with a limited number of employees. We are highly dependent on our key personnel, and if we are not successful in attracting, motivating, and retaining highly qualified personnel, we may not be able to successfully implement our business strategy.

Our ability to compete in the highly competitive biotechnology and pharmaceutical industries depends upon our ability to attract, motivate, and retain highly qualified managerial, scientific, and medical personnel. We are highly dependent on our management, particularly our President and Chief Executive Officer, Remi Barbier, and our scientific and technical personnel. The loss of the services provided by any of our executive officers, other key employees, and other scientific and medical advisors, and our inability to find suitable replacements, could result in delays in the development of our product candidates and harm our business.

Competition for skilled personnel is intense and the turnover rate can be high, which may limit our ability to hire and retain highly qualified personnel on acceptable terms or at all. We expect that we may need to recruit talent from outside of our region in Austin, Texas, and doing so may be costly and difficult.

To induce valuable employees to remain at our company, in addition to salary and cash incentives, we have provided equity option grants that vest over time or a cash bonus plan. The value to employees of these equity grants that vest over time or cash bonus plans may be significantly affected by movements in our stock price that are beyond our control and may at any time be insufficient to counteract more lucrative offers from other companies. Although we have employment agreements with our key employees, these employment agreements provide for at-will employment, which means that any of our employees could leave our employment at any time, with or without notice. If we are unable to attract and incentivize quality personnel on acceptable terms, or at all, it may cause our business and operating results to suffer.

We may need to cease our operations if we are unable to attract and retain key personnel.

We are engaged in developing early-stage technologies and will continue to do so for the foreseeable future. Unlike larger organizations, we rely on a very small number of highly skilled, and highly sought after, employees to continue the advancement of our development stage technologies. The knowledge and skills contributed by our key employees may be irreplaceable and the loss of a key employee may cause substantial negative financial, operational and scientific consequences for our business. As an example, our research grant awards from NIH depend in part on the continued participation of certain key employees, known as a Principal Investigator. The loss of a Principal Investigator may result in the loss of one or more research grant awards from NIH, which would have significant adverse effects on our ability to continue to conduct, conclude or fund our research programs in Alzheimer's disease. Likewise, the intellectual property that is intended to protect our development stage technologies is still evolving and its evolution remains highly dependent on a small number of employees with specific expertise. The loss of a key employee may jeopardize our existing or pending intellectual property or may prevent us from accessing the technical information and knowledge necessary to extend our portfolio of intellectual property. Furthermore, we believe the adverse effects that may result from losing a key employee's participation cannot be compensated with any specific insurance policies, such as "key person" or "business life" insurance. If we are not successful in retaining key employees, our business and financial condition will suffer, and we may need to cease our operations.

If our current research collaborators or scientific advisors terminate their relationships with us or develop relationships with a competitor, our ability to continue our business operations could be adversely affected.

We have relationships with unaffiliated research collaborators at academic and other institutions who conduct research at our request. These research collaborators are not our employees. As a result, we have limited control over their activities and,

except as otherwise required by our collaboration agreements, can expect only limited amounts of their time to be dedicated to our activities. Our ability to discover drugs and biomarkers involved in human disease and validate and commercialize diagnostic tests will depend in part on the continuation of these collaborations. If any of these collaborations are terminated, we may not be able to enter into other acceptable collaborations. In addition, our existing collaborations may not be successful. Our research collaborators and scientific advisors may have relationships with other commercial entities, some of which could compete with us. Our research collaborators and scientific advisors sign agreements which provide for the confidentiality of our proprietary information and the results of studies conducted at our request. We may not, however, be able to maintain the confidentiality of our technology and other confidential information related to all collaborations. The dissemination of our confidential information could have a material adverse effect on our business.

Our business may be impacted by political events, war, terrorism, business interruptions and other geopolitical events and uncertainties beyond our control.

War, terrorism, geopolitical uncertainties and other business interruptions could cause damage to, disrupt or cancel the conduct of our clinical studies on a global or regional basis, which could have a material adverse effect on our business, clinical sites or vendors with which we do business. Such events could also decrease patient demand to enroll in our clinical studies or make it difficult or impossible for us to deliver products and services to our clinical investigational sites. In addition, territorial invasions can lead to cybersecurity attacks on technology companies, such as ours, located far outside of the conflict zone. In the event of prolonged business interruptions due to geopolitical events, we could incur significant losses, require substantial recovery time and experience significant expenditures in order to resume our business or clinical operations. We have no operations in Russia or the Ukraine, but we do not and cannot know if the current uncertainties in these geopolitical areas, which are unfolding in real-time, may escalate and result in broad economic and security conditions or rationing of medical supplies, which could limit our ability to conduct clinical trials outside the U.S. or result in material implications for our business. In addition, our insurance policies typically contain a war exclusion of some description and we do not know how our insurers are likely to respond in the event of a loss alleged to have been caused by geopolitical uncertainties.

Risks Related to Financial Condition and Capital Requirements

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

We have incurred net losses in each reporting period since our inception, including a net loss of \$32.4 million for the year ended December 31, 2021. As of December 31, 2021, we had an accumulated deficit of \$207.3 million.

We have invested significant financial resources in research and development activities for product candidates. We do not expect to generate revenue from product sales for several years, if at all. The amount of our future net losses will depend, in part, on the level of our future expenditures and revenue. Moreover, our net losses may fluctuate significantly from quarter to quarter and year to year, such that a period-to-period comparison of our results of operations may not be a good indicator of our future performance.

We expect to continue to incur significant expenses and higher operating losses for the foreseeable future. We anticipate that our expenses will increase substantially as we:

- continue our research and discovery activities;
- advance our current and any future product candidates through preclinical and clinical development;
- initiate and conduct additional preclinical, clinical, or other studies for our product candidates;
- work with our CDMO's to scale up the manufacturing processes for our product candidates;
- seek regulatory approvals and marketing authorizations for our product candidates;
- obtain, maintain, protect, defend and enforce our intellectual property portfolio;
- attract, hire, and retain qualified personnel;
- provide additional internal infrastructure to support our continued research and development operations and any planned commercialization efforts in the future;
- experience any delays or encounter other issues related to our operations; and
- meet the requirements and demands of being a public company.

Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' equity and working capital. In any quarter, our operating results could be below the expectations of securities analysts or investors, which could cause our stock price to decline.

We have broad discretion in the use of the net proceeds from any of our financing transactions and may not use them effectively.

We have broad discretion in the application of the net proceeds from our financing transactions, and investors will not have the opportunity to assess whether the net proceeds are being used appropriately. We could spend the net proceeds from offerings in ways that vary substantially from their intended use, do not improve our results of operations or enhance the value of our common stock. Our failure to apply these funds effectively could result in financial losses that could have a material adverse effect on our business, cause the price of our common stock to decline and delay the development of our product candidates. Pending their use, we may invest the net proceeds from our financing transactions in a manner that does not produce income or that loses value.

We have no product revenues and may never achieve revenues or profitability based on product revenues.

We have no products approved for commercial sale. To obtain revenues from the sales of our product candidates that are significant or large enough to achieve profitability, we must succeed, either alone or with third parties, in developing, obtaining regulatory approval for, manufacturing, and marketing product candidates with significant commercial value. This is a significant endeavor that few early-stage biopharmaceutical companies can successfully achieve. Our ability to generate revenue and achieve profitability depends on many factors, including:

- completing research and preclinical and clinical development of our product candidates;
- obtaining regulatory approvals and marketing authorizations for product candidates for which we successfully complete clinical development;
- developing a sustainable and scalable manufacturing process for our product candidates, as well as establishing and maintaining commercially viable supply relationships with third parties that can provide adequate products and services to support clinical activities and commercial demand for our product candidates;
- identifying, assessing, acquiring, and/or developing new product candidates;
- negotiating favorable terms in any collaboration, licensing, or other arrangements into which we may enter;
- addressing any competing technological and market developments;
- maintaining, protecting, expanding, and enforcing our portfolio of intellectual property rights, including patents, trade secrets, and know-how; and
- attracting, hiring, and retaining qualified personnel.

Because of the numerous risks and uncertainties associated with drug development, we are unable to predict the timing or amount of our expenses, or when we will be able to generate any meaningful revenue or achieve or maintain profitability, if ever. In addition, our expenses could increase beyond our current expectations if we are required by FDA or foreign regulatory agencies to perform studies in addition to those that we currently anticipate, or if there are any delays in any of our clinical studies or the development of any of our product candidates.

We may require additional capital to fund our operations and to complete the development of our product candidates. A failure to obtain this necessary capital on acceptable terms, or at all, could force us to delay, limit, reduce, or terminate our commercialization efforts, product development, or other operations.

Our operations have required substantial amounts of cash since inception, and we expect our expenses to increase significantly in the foreseeable future. To date, we have financed our operations primarily through the sale of equity securities, research grants and payments received from prior third-party collaborations. Developing our product candidates and conducting clinical studies for the treatment of neurodegenerative diseases, including Alzheimer's disease, will require substantial amounts of capital. We will also require a significant amount of capital to commercialize any approved products.

As of December 31, 2021, we had cash and cash equivalents of \$233.4 million. Based on our current operating plan, we believe that our existing cash and cash equivalents will be sufficient to fund our projected operations for at least the next 12 months. Our estimate as to how long we expect our existing cash and cash equivalents to be available to fund our operations

is based on assumptions that may prove inaccurate, and we could use our available capital resources sooner than we currently expect. In addition, 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.

We may require additional capital for the further development of our product candidates. Additional capital may not be available when we need it, or on terms acceptable to us or at all. We have no committed source of additional capital. If adequate capital is not available to us on a timely basis, we may be required to significantly delay, limit, reduce or terminate our research and development programs or the commercialization of product candidates, if approved, or be unable to continue or expand our operations, or otherwise capitalize on our business opportunities, as desired, which could materially affect our business, financial condition, results of operations, and growth prospects and cause the price of our common stock to decline.

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 diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt 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 additional funds through collaborations, strategic alliances, or licensing arrangements with pharmaceutical partners, 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.

Global credit and financial market conditions could negatively impact the value of our portfolio of cash equivalents and our ability to meet our financing objectives.

Our cash and cash equivalents are generally maintained in highly liquid investments with original maturities of 90 days or less at the time of purchase. While, as of the date of this filing, we are not aware of any downgrades, material losses, or other significant deterioration in the fair value of our cash equivalents since December 31, 2021, no assurance can be given that deterioration in conditions of the global credit and financial markets would not negatively impact our current portfolio of cash equivalents or our ability to meet our financing objectives.

Risks Related to the Ownership of Our Common Stock

We do not know whether a sufficient market will continue to develop for our common stock or what the market price of our common stock will be, and, as a result, it may be difficult for investors to sell shares of our common stock.

If a market for our common stock is not sustained, it may be difficult to sell shares of our 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 has historically been highly volatile, and we expect it to continue to be volatile, which could result in substantial losses for investors who purchase our shares.

For example, the closing price of our common stock has fluctuated from a low of \$32.15 to a high of \$135.30 over the 12 months preceding the filing date of this Annual Report on Form 10-K. Some of the factors that may cause the market price of our common stock to fluctuate include:

- the success of existing or new competitive products or technologies;
- the timing and results of clinical studies for our current product candidates and any future product candidates that we may develop;
- failure or discontinuation of any of our product development and research programs;
- results of preclinical studies, clinical studies, or regulatory approvals of product candidates of our competitors, or announcements about new research programs or product candidates of our competitors;
- 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;

- the level of expenses related to any of our research programs, clinical development programs, or 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 or development timelines;
- 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;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry, and market conditions; and
- securities litigation, regardless of merit.

In recent years, the stock market in general, Nasdaq, and the markets for early stage companies and pharmaceutical and biotechnology companies, 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 are currently and 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.

If securities analysts do not publish research or reports about our business, or we are the subject of negative publicity, the price of our stock could decline.

The trading market for our common stock depends, in part, on the research and reports that securities or industry analysts publish about us or our business. We do not control these analysts. If one or more of the analysts who cover us downgrade our stock or publish inaccurate or unfavorable evaluations of our company or our stock, the price of our stock could decline. If one or more of these analysts cease coverage of our company or fail to publish reports covering our company regularly, our stock may lose visibility in the market, which in turn could cause our stock price to decline. In addition, if we are the subject of negative publicity, whether from an analyst, academic, social media, industry group or the general or financial press, our stock price may decline.

Effective December 31, 2021, we no longer qualify as “a smaller reporting company” and the reduced disclosure requirements applicable to smaller reporting companies no longer apply beginning with our quarterly report for the three-month period ended March 31, 2022, which will increase our costs and demands on management.

As a result of our public float (the market value of our common shares held by non-affiliates) as of June 30, 2021, we became a large accelerated filer as of December 31, 2021 and, therefore, no longer qualify as a “smaller reporting company” as defined under the Exchange Act. However, we are not required to reflect the change in our smaller reporting company status until our quarterly report for the three-month period ended March 31, 2022.

As a smaller reporting company, we have had the option to take advantage of certain exemptions from various reporting requirements that are applicable to other public companies, including, but not limited to, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and exemptions related to certain “Say-on-Pay” rules under Section 14A of the Exchange Act, including requirements to hold a nonbinding advisory vote on named executive officer compensation, the frequency of such votes and arrangements with named executive officers regarding compensation based on or related to an acquisition, merger, or similar transaction.

General Risk Factors

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 (Exchange Act), including the requirements of Section 404(a) of SOX, which require annual management assessments of the effectiveness of our internal control over financial reporting. Section 404(b) of the Sarbanes-Oxley Act (“SOX”) also requires our independent auditors to attest to, and report on, the effectiveness of our internal control over financial reporting.

The rules governing the standards that must be met for management to assess our internal control over financial reporting are complex and require significant documentation, testing and possible remediation to meet the detailed standards under the rules. During testing, our management may identify material weaknesses or deficiencies which may not be remedied in time to meet the deadline imposed by SOX. 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 consolidated financial statements for external purposes in accordance with accounting principles generally accepted in the U.S. Any failure to maintain effective internal controls, or if our independent registered public accounting firm is unable to attest to the effectiveness of our internal control over financial reporting, could have an adverse effect on our business, financial position, and results of operations.

Anti-takeover provisions in our charter documents and Delaware law may prevent or delay removal of incumbent management or a change of control.

Anti-takeover provisions of our amended and restated certificate of incorporation and amended and restated bylaws and Delaware law may have the effect of deterring or delaying attempts by our stockholders to remove or replace management, engage in proxy contests and effect changes in control. The provisions of our charter documents include:

- a classified board so that only one of the three classes of directors on our Board of Directors (the “Board”) is elected each year;
- elimination of cumulative voting in the election of directors;
- procedures for advance notification of stockholder nominations and proposals;
- the ability of the Board to amend our bylaws without stockholder approval; and
- the ability of the Board to issue up to 10,000,000 shares of preferred stock without stockholder approval upon the terms and conditions and with the rights, privileges and preferences as the Board may determine.

In addition, as a Delaware corporation, we are subject to Delaware law, including Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a Delaware corporation from engaging in any business combination with any interested stockholder for a period of three years following the date that the stockholder became an interested stockholder unless certain specific requirements are met as set forth in Section 203.

These provisions, alone or together, could have the effect of deterring or delaying changes in incumbent management, proxy contests or changes in control.

Our amended and restated bylaws provide that the federal district courts of the United States of America shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Laws of 1933, which could limit our stockholders’ ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated bylaws provide that the federal district courts of the United States of America shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act of 1933.

While the Delaware courts have determined that such choice of forum provisions are factually valid, a stockholder may nevertheless seek to bring a claim in a venue other than those designated in the exclusive forum provisions. In such instance, we would expect to vigorously assert the validity and enforceability of the exclusive forum provisions of our amended and restated bylaws. This may require significant additional costs associated with resolving such action in other jurisdictions and there can be no assurance that the provisions will be enforced by a court in those other jurisdictions.

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 these types of lawsuits. Furthermore, the enforceability of similar choice of forum provisions in other companies' certificates of incorporation or bylaws has been challenged in legal proceedings, and it is possible that a court could find these types of provisions to be inapplicable or unenforceable. If a court were to find the exclusive-forum provision contained in our amended and restated 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 harm our business.

Changes in our ownership could limit our ability to utilize net operating loss carryforwards.

As of December 31, 2021, we had aggregate federal net operating loss carryforwards of approximately \$118.0 million, which begin to expire in 2029. Under Section 382 of the Internal Revenue Code of 1986, as amended, changes in our ownership may limit the amount of our net operating loss carryforwards that could be utilized annually to offset our future taxable income, if any. This limitation would generally apply in the event of a cumulative change in ownership of our company of more than 50% within a rolling three-year period. Any such limitation may significantly reduce our ability to utilize our net operating loss carryforwards and tax credit carryforwards. Any such limitation, whether as the result of past offerings, sales of our common stock by our existing stockholders or additional sales of our common stock by us in the future could have a material adverse effect on our results of operations in future years. We have not completed a study to assess whether an ownership change for purposes of Section 382 has occurred, or whether there have been multiple ownership changes since our inception, nor do we plan to do so due to the significant costs and complexities associated with such study.

We may sell additional equity or debt securities to fund our operations, and have outstanding securities exercisable for our common stock, which may result in dilution to our stockholders and impose restrictions on our business.

In order to raise additional capital to support our operations, we may sell additional shares of our common stock or other securities convertible into or exchangeable for our common stock which could result in dilution our stockholders.

We cannot assure you that we will be able to sell shares or other securities in any other offering at a price per share that is equal to or greater than the price per share paid by investors in prior offerings, and investors purchasing our shares or other securities in the future could have rights superior to existing shareholders. The price per share at which we sell additional shares of our common stock or securities convertible into or exchangeable for our common stock in future transactions may be higher or lower than the price per share in prior offerings. You may also be diluted upon the exercise of outstanding stock options as of December 31, 2021 to purchase 2,663,727 shares of our common stock at a weighted average price of \$11.56 per share, and the future issuance of up to 152,188 compensatory equity awards authorized under our 2018 Omnibus Incentive Plan and up to 58,017 shares we may sell under our Employee Stock Purchase Plan.

Item 1B. *Unresolved Staff Comments*

None.

Item 2. *Properties*

We lease approximately 6,000 square feet of office space pursuant to a non-cancelable operating lease in Austin, Texas that expires April 30, 2024. We also lease an additional 3,600 square feet of office space in Austin, Texas that expires on April 30, 2022.

On August 4, 2021, we completed the purchase of a two-building office complex in Austin, Texas, which will serve as our future corporate headquarters. The seller was a third party not affiliated with us. This property is intended to accommodate our anticipated growth and expansion of our operations in the coming years. Maintenance, physical facilities, leasing, property management and other key responsibilities related to property ownership are being outsourced to professional real-estate

managers. The purchase price of the property was \$22.0 million, including closing costs, funded with cash on hand. The office complex measures approximately 90,000 rentable square feet. At acquisition and December 31, 2021, the property was 59% leased. The Company is planning to occupy approximately 25% of the property in 2022.

Item 3. *Legal Proceedings*

From time to time, we may become involved in litigation or other legal proceedings and claims, including U.S. government inquiries, investigations and Citizen Petitions submitted to FDA. The outcome of these proceedings is inherently uncertain. Regardless of outcome, legal proceedings can have an adverse impact on us because of defense and settlement costs, diversion of management resources, and other factors. At this time, no assessment can be made as to their likely outcome or whether the outcome will be material to us. No information is available to indicate that it is probable that a loss has been incurred or can be reasonably estimated as of the date of the consolidated financial statements and, as such, no accrual for these matters has been recorded within the consolidated financial statements.

Government Investigations

Certain government agencies have asked us to provide them with corporate information and documents. We have been cooperating and will continue to cooperate with government authorities. No government agency has informed us that any wrongdoing has occurred by any party. We cannot predict the outcome or impact of any these ongoing matters, including whether a government agency may pursue an enforcement action against us or others.

FDA Citizen Petitions

In August 2021, an attorney representing anonymous clients submitted a Citizen Petition to the FDA. This Citizen Petition requested that the FDA Commissioner immediately halt the clinical development of simufilam, our drug candidate for Alzheimer's disease. The attorney subsequently disclosed that his clients are short sellers, that is, investors who earn a profit from a decline in our stock price. In September 2021, the same attorney filed another Citizen Petition, which requested that the FDA Commissioner immediately rescind previously granted Special Protocol Assessments (SPAs) for our Phase 3 clinical program with simufilam. FDA has not halted the clinical development of simufilam and has not rescinded our SPAs.

In February 2022, FDA denied both Citizen Petitions and their supplements. As of February 23, 2022, FDA's denial letter could be found at: <https://www.regulations.gov/document/FDA-2021-P-0930-0228>.

In October 2021, a Citizen Petition was submitted to FDA by an individual unknown to us. This Citizen Petition requests FDA "...approval of simufilam and immediate initiation of Phase 4 trials for further efficacy, safety assessment and, most critically, to address one of the greatest needs in modern medicine." The FDA has not engaged with us regarding this Citizen Petition.

In November 2021, an academic physician not previously known to us submitted a Citizen Petition to FDA requesting "Accelerated Approval of Simufilam for the most significant medical need in the United States of America." The FDA has not ruled on this Citizen Petition.

No assurance can be given that FDA will grant, deny, dismiss, defer or otherwise act upon these or any other Citizen Petition or supplements within any timeframe, if ever.

Securities Class Actions and Shareholder Derivative Action

Between August 27 and October 26, 2021, four putative class action lawsuits were filed alleging violations of the federal securities laws by us and certain named officers. The complaints rely on allegations contained in two Citizen Petitions that were submitted to FDA, and allege that various statements made by the defendants regarding simufilam were rendered materially false and misleading. The two Citizen Petitions were subsequently denied by FDA. These actions were filed in the U.S. District Court for the Western District of Texas. The complaints seek unspecified compensatory damages and other relief on behalf of a purported class of purchasers of our securities between September 14, 2020 and August 27, 2021. We expect that the cases will be consolidated and that a lead plaintiff and lead counsel will be appointed and thereafter that a consolidated amended complaint will be filed. We believe the lawsuit claims are without merit and intend to defend against these lawsuits vigorously. We are unable to estimate the possible loss or range of loss, if any, associated with these lawsuits.

On November 4, 2021, a related shareholder derivative action was filed, purportedly on behalf of the Company, in the U.S. District Court for the Western District of Texas, asserting claims under the U.S. securities laws and state fiduciary duty laws against certain named officers and the members of the Company's board of directors. The complaint relies on allegations made in two Citizen Petitions that were submitted to FDA. The two Citizen Petitions, which were subsequently denied by FDA, allege, among other things, that the individual defendants exposed the Company to unspecified damages and securities law liability by causing it to make materially false and misleading statements, in violation of the U.S. securities laws and in breach of their fiduciary duties to the Company. The derivative case seeks, among other things, to recover unspecified compensatory damages on behalf of the Company arising out of the individual defendant's alleged wrongful conduct. Although the plaintiffs in the derivative cases does not seek relief against the Company, we have certain indemnification obligations to the individual defendants. Since November 4, 2021, three additional shareholder derivative actions were filed alleging substantially similar claims, two in the U.S. District Court for the Western District of Texas, and one in Texas state court (Travis County District Court). The state court action has been stayed pending the resolution of the motions to dismiss in the securities class actions. The parties to the three federal court actions have filed a motion, which the court has not yet ruled on, to consolidate and stay pending the resolution of motions to dismiss in the securities class actions. We are unable to estimate the possible loss or range of loss, if any, associated with these lawsuits.

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 Price of and Dividends of the Registrants Common Equity and Related Stockholder Matters

Our common stock is quoted on Nasdaq, under the symbol "SAVA."

As of February 23, 2022, there were approximately 30 registered holders of record of our common stock. The actual number of stockholders is greater than this number of record holders and includes stockholders who are beneficial owners but whose shares are held in street name by brokers and other nominees.

Dividend Policy

We currently expect to retain future earnings, if any, for use in the operation and expansion of our business and, notwithstanding our special non-dividend distributions in December 2012 (of \$0.75 per share of common stock totaling \$34.0 million) and December 2010 (of \$2.00 per share of common stock totaling \$85.7 million), we have not paid and do not anticipate paying any cash dividends in the foreseeable future.

Item 6. *[Reserved]*

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

This discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and accompanying notes included elsewhere in this Annual Report on Form 10-K. This discussion contains forward-looking statements that involve risk and uncertainties, such as statements of our plans, objectives, expectations, and intentions, that are based on the beliefs of our management. Operating results are not necessarily indicative of results that may occur in future periods. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in the "Risk Factors" section of this Annual Report on Form 10-K.

Overview

We are a clinical-stage biotechnology company based in Austin, Texas. Our mission is to detect and treat neurodegenerative diseases, such as Alzheimer's disease. Our novel science is based on stabilizing – but not removing – a critical protein in the brain.

Over the past 10 years, we have combined state-of-the-art technology with new insights in neurobiology to develop novel solutions for Alzheimer's disease and other neurodegenerative diseases. Our strategy is to leverage our unique scientific/clinical platform to develop a first-in-class program for treating neurodegenerative diseases, such as Alzheimer's.

We currently have two biopharmaceutical assets under development:

- our lead therapeutic product candidate, called simufilam, is a novel treatment for Alzheimer's disease; and
- our lead investigational diagnostic product candidate, called SavaDx, is a novel way to detect the presence of Alzheimer's disease from a small sample of blood.

Our scientific approach for the treatment of Alzheimer's disease seeks to simultaneously suppress *both* neurodegeneration and neuroinflammation. We believe our ability to improve multiple vital functions in the brain represents a new, different and crucial approach to address Alzheimer's disease.

Our lead therapeutic product candidate, simufilam, is a proprietary small molecule (oral) drug. Simufilam targets an altered form of a protein called filamin A (FLNA) in the Alzheimer's brain. Published studies have demonstrated that the altered form of FLNA causes neuronal dysfunction, neuronal degeneration and neuroinflammation.

We believe simufilam improves brain health by reverting altered FLNA back to its native, healthy conformation, thus countering the downstream toxic effects of altered FLNA. We have generated and published experimental and clinical evidence of improved brain health with simufilam. Importantly, simufilam is not dependent on clearing amyloid from the brain. Since simufilam has a unique mechanism of action, we believe its potential therapeutic effects may be additive or synergistic with those of other therapeutic candidates aiming to treat neurodegeneration.

On October 6, 2021, and November 18, 2021, we announced initiation of our two Phase 3 studies of simufilam, respectively.

The first Phase 3 study, called RETHINK-ALZ, is designed to evaluate the safety and efficacy of oral simufilam 100 mg in enhancing cognition and slowing cognitive and functional decline over 52 weeks. Secondary objectives include the assessment of simufilam's effect on neuropsychiatric symptoms and caregiver burden. This randomized, double-blind, placebo-controlled study plans to enroll approximately 750 patients with mild-to-moderate Alzheimer's disease in the U.S. and Canada and, eventually, overseas.

The second Phase 3 study, called REFOCUS-ALZ, is designed to evaluate the safety and efficacy of oral simufilam 100 mg and 50 mg over 76 weeks. This randomized, double-blind, placebo-controlled study plans to enroll approximately 1,000 patients with mild-to-moderate Alzheimer's disease in the U.S. and Canada and, eventually, overseas.

Our investigational diagnostic product candidate, called SavaDx, is an early-stage program focused on detecting the presence of Alzheimer's disease from a small sample of blood. The goal is to make the detection of Alzheimer's disease as simple as getting a blood test.

Financial Overview

We have yet to generate any revenues from product sales. We have an accumulated deficit of \$207.3 million at December 31, 2021. These losses have resulted principally from costs incurred in connection with research and development activities, salaries and other personnel-related costs and general corporate expenses. Research and development activities include costs of preclinical and clinical studies as well as clinical supplies associated with our product candidates. Salaries and other personnel-related costs include stock-based compensation associated with options and other equity awards granted to employees and non-employees. Our operating results may fluctuate substantially from period to period as a result of the timing of preclinical activities, enrollment rates of clinical studies for our product candidates and our need for clinical supplies.

We believe that our cash and cash equivalents at December 31, 2021, will enable us to fund our operating expenses for at least the next 12 months. In addition, we may seek in the future to fund our operations through additional public or private equity or debt financings or other sources. However, we may be unable to raise additional funds or enter into such other arrangements when needed on favorable terms or at all. If we are unable to obtain financing or reach profitability, the related lack of liquidity will have a material adverse effect on our operations and future prospects, and we may have to significantly delay, scale back or discontinue the development and commercialization of simufilam, our lead drug candidate, or delay our efforts to expand our product pipeline.

We expect to continue to use significant cash resources in our operations for the next several years. Our cash requirements for operating activities and capital expenditures may increase substantially in the future as we:

- continue our ongoing Phase 3 program with simufilam;
- manufacture large-scale supplies for simufilam;
- conduct other preclinical and clinical studies for our product candidates;
- seek regulatory approvals for our product candidates;
- develop, formulate, manufacture and commercialize our product candidates;
- implement additional internal systems and develop new infrastructure;
- acquire or in-license additional products or technologies, or expand the use of our technology;
- maintain, defend and expand the scope of our intellectual property; and
- hire additional personnel.

Product revenue will depend on our ability to receive regulatory approvals for, and successfully market, our product candidates. If our development efforts result in regulatory approval and successful commercialization of our product candidates, we expect to generate revenue from direct sales of our drugs and/or, if we license our drugs to future collaborators, from the receipt of license fees and royalties from sales of licensed products. We conduct our research and development programs through a combination of internal and collaborative programs. We rely on arrangements with universities, certain collaborators, CDMOs, CROs and clinical research sites for a significant portion of our product development efforts.

Components of Operating Results

Operating Expenses

Research and Development Expenses

We focus substantially all our research and development efforts on research and development in the areas of neurology. The following table summarizes expenses by category for research and development efforts (in thousands):

	Year ended December 31,	
	2021	2020
Compensation	\$ 5,935	\$ 1,575
Contractor fees and supplies	17,970	980
Other common costs	908	498
	<u>\$ 24,813</u>	<u>\$ 3,053</u>

Research and development expenses include compensation, contractor fees and supplies as well as allocated common costs. Contractor fees and supplies generally include expenses for clinical studies and preclinical studies and costs for formulation and manufacturing activities. Other common costs include the allocation of common costs such as facilities. During the years ended December 31, 2021 and 2020, we received \$3.9 million and \$4.2 million in research grants from the NIH, respectively. These reimbursements were recorded as a reduction to our research and development expenses.

Our technology has been applied across certain of our portfolio of product candidates. Data, know-how, personnel, clinical results, research results and other matters related to the research and development of any one of our product candidates also relate to, and further the development of, our other product candidates. As a result, costs allocated to a specific product candidate may not necessarily reflect the actual costs surrounding research and development of such product candidate due to cross application of the foregoing.

Estimating the dates of completion of clinical development, and the costs to complete development, of our product candidates would be highly speculative, subjective and potentially misleading. Pharmaceutical products take a significant amount of time to research, develop and commercialize. The clinical study portion of the development of a new drug alone usually spans several years. We expect our research and development expenses to increase substantially during the next few years as we seek to advance our product candidates through the clinical development process and, potentially to seek regulatory approval of simufilam. Over the next few years, we expect our preclinical, clinical and contract manufacturing expenses to increase significantly relative to what we have incurred to date. We expect to reassess our future research and development plans based on our review of data we receive from our current research and development activities. The cost and pace of our future research and development activities are linked and subject to change.

Critical Accounting Estimates

The preparation of our consolidated financial statements in accordance with U.S. generally accepted accounting principles requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues, expenses and interest income in our consolidated financial statements and accompanying notes. We evaluate our estimates on an ongoing basis, including those estimates related to agreements and research collaborations. We base our estimates on historical experience and various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. The following items in our consolidated financial statements require significant estimates and judgments:

- **Research Contracts and Accruals.** We have entered into various research and development contracts with research institutions and other third-party vendors. Related payments are recorded as research and development expenses as incurred. We record accruals for estimated ongoing research costs. When evaluating the adequacy of the accrued liabilities, we analyze progress of the studies including the phase or completion of events, invoices received and contracted costs. Significant judgments and estimates are made in determining the accrued balances at the end of any reporting period. Actual results could differ from our estimates. Our historical accrual estimates have not been materially different from actual costs.
- **Legal and other contingencies.** The Company is subject to lawsuits, claims, allegations and investigations regarding simufilam. The Company believes the claims are without merit and intends to defend against these lawsuits vigorously. The Company is unable to estimate the possible loss or range of loss, if any, associated with these lawsuits. However, litigation is subject to inherent uncertainties, and unfavorable rulings could occur. If an unfavorable ruling were to occur, it may cause a material adverse impact on the results of operations, cash flows, or financial condition for the period in which the ruling occurs, or future periods. Refer to Note 12 to the Consolidated Financial Statements for further information on contingencies.
- **2020 Cash Incentive Bonus Plan.** In 2020, we established the 2020 Cash Incentive Bonus Plan (the “Plan”) to incentivize Plan participants. Awards under the Plan are accounted for as liability awards under ASC 718, “Stock-based Compensation”. The fair value of each potential Plan award will be determined once a grant date occurs and will be remeasured each reporting period. Compensation expense associated with the Plan will be recognized over the expected achievement period for each Plan award, when a Performance Condition is considered probable of being met.

The Plan was established to promote the long-term success of the Company by creating an “at-risk” cash bonus program that rewards Plan participants with additional cash compensation in lockstep with significant increases in our market capitalization. The Plan is considered “at-risk” because Plan participants will not receive a cash bonus unless our market capitalization increases significantly and (1) we complete a merger or acquisition transaction that constitutes a sale of ownership of the Company or its assets (a Merger Transaction) or (2) the Compensation Committee of the Board (the Compensation Committee) determines the Company has sufficient cash on hand, as defined in the Plan, to render payment (each, a “Performance Condition”), neither of which may ever occur. Because of the inherent discretion and uncertainty regarding these requirements, we have concluded that a Plan grant date has not occurred as of December 31, 2021. No actual cash payments were authorized or made to participants under the Plan through December 31, 2021.

- **Stock-based Compensation.** We recognize non-cash expense for the fair value of all stock options and other share-based awards. We use the Black-Scholes option valuation model to calculate the fair value of stock options, using the single-option award approach and straight-line attribution method. Significant judgments and estimates are made in determining inputs to the Black-Scholes option valuation model. See Note 7 to our Consolidated Financial Statements for significant assumptions regarding stock-based compensation.

Recent Accounting Pronouncements

See Note 2. Summary of Significant Accounting Policies, in Notes to the Consolidated Financial Statements in Item 8 of Part II of this Annual Report on Form 10-K for a full description of recent accounting pronouncements, including the expected dates of adoption and estimated effects on financial condition and results of operations, which is incorporated herein by reference.

Results of Operations

Research and Development Expense

Research and development expense consist primarily of costs of drug development work associated with our product candidates, including:

- clinical studies,
- preclinical testing,
- clinical supplies and related formulation and design costs, and
- compensation and other personnel-related expenses.

Research and development expenses increased to \$24.8 million in 2021 from \$3.1 million in 2020, representing a 713% increase. This increase was due primarily to costs related to manufacture of clinical trial supplies for and the initiation of a Phase 3 clinical program with simufilam, costs of an on-going open-label study and cognition maintenance study with simufilam, as well as increased personnel expenses compared to the prior year. Research and development expenses also included stock-based compensation expenses of \$1.3 million in 2021 compared to \$0.5 million in 2020.

We received NIH reimbursement of \$3.9 million from research grants in 2021 recorded as a reduction to research and development expense, as compared to \$4.2 million in 2020.

We expect research and development expense to increase in future periods as we manufacture drug supply and continue our Phase 3 clinical program with simufilam.

General and Administrative Expense

General and administrative expenses consist of personnel costs, allocated expenses and other expenses for outside professional services, including legal, human resources, audit and accounting services. Personnel costs consist of salaries, bonus, benefits and stock-based compensation. Allocated expenses consist primarily of existing facility costs. We incur insurance, audit, investor relations, SOX compliance and other administrative and professional services expenses associated with operating as a public company, including expenses related to compliance with the rules and regulations of the SEC and Nasdaq. General and administrative expense increased to \$8.1 million in 2021 from \$3.7 million in 2020. The 115% increase was due primarily to higher legal fees, personnel costs and insurance expenses compared to the prior year. In addition, 2021 expense included \$500,000 of depreciation and amortization for the two-building office complex in Austin, Texas, purchased in third quarter 2021.

We expect general and administrative expense for 2022 will increase in the foreseeable future compared to 2021 due primarily to anticipated higher legal and professional fees related to ongoing securities class action and derivative lawsuits, governmental investigations as well as higher operating costs such as compliance costs and depreciation and amortization.

Gain on Sale of Property and Equipment

There were no sales of property and equipment during the year ended December 31, 2021.

During the year ended December 31, 2020, we sold surplus manufacturing equipment to a non-affiliated third party and received proceeds totaling \$360,000. The original cost of the property and equipment was \$892,000 and accumulated depreciation was \$878,000, resulting in a gain on sale of property and equipment of \$346,000 during the year ended December 31, 2020.

Interest Income

Interest and other income, net, was \$49,000 in 2021 compared to \$112,000 in 2020. The decrease in interest income was due to lower interest rates, which more than offset additional interest from increases in our cash balances compared to the prior period.

Other income, net

We record the activities related to leasing office space to third parties in buildings we own as other income, net, as leasing is not core to the Company's operations. Other income, net, was \$434,000 during the year ended December 31, 2021. There was no other income, net, during the year ended December 31, 2020 as we acquired the two-building office complex in August 2021.

Liquidity and Capital Resources

Since inception, we have financed our operations primarily through public and private stock offerings, payments received under collaborative agreements and interest earned on our cash and cash equivalents balances. We intend to continue to use our capital resources to fund research and development activities, capital expenditures, working capital requirements and other general corporate purposes. As of December 31, 2021, cash and cash equivalents totaled \$233.4 million.

2021 Registered Direct Offering

On February 12, 2021, we completed a common stock offering pursuant to which certain investors purchased 4,081,633 shares of common stock at a price of \$49.00 per share. Net proceeds of the offering were approximately \$189.7 million after deducting offering expenses.

2020 Follow-on Public Offering

On November 13, 2020, we completed the sale of 9,375,000 shares of our common stock in an underwritten public offering at a price of \$8.00 per share. We received net proceeds from the offering of approximately \$70.3 million after deducting underwriting discounts and offering expenses.

Common Stock Warrants

In August 2018, we issued warrants to purchase up to an aggregate of 9.1 million shares of its common stock in conjunction with an offering of our common stock.

During 2021, we received proceeds of \$0.7 million from the exercise of 0.6 million shares pursuant to warrants. During 2020, we received proceeds of \$4.9 million from the exercise of 4.0 million shares pursuant to warrants.

There were no warrants outstanding following the 2021 exercises.

At the Market (ATM) Common Stock Issuance

On March 27, 2020, we established an at-the-market offering program (ATM) to sell, from time to time, shares of our common stock having an aggregate offering price of up to \$100 million in transactions pursuant to a shelf registration statement that was declared effective by the U.S. Securities and Exchange Commission (the SEC) on May 5, 2020. We are obligated to pay a commission of 3.0% of the gross proceeds from the sale of shares of common stock in the offering. We are not obligated to sell any shares in the offering.

There were no common stock sales under the ATM during the years ended December 31, 2021 and 2020.

NIH Research Grant Awards

Our research has been supported by NIH under multiple research grant awards. Strong, long-term support from NIH has allowed us to advance our two lead product candidates, simufilam and SavaDx, into clinical development.

In May 2021, we were awarded a new research grant award from NIH of up to \$2.7 million to support clinical readiness activities for a Phase 3 program with simufilam. In April 2020, we were awarded a research grant from NIH of up to \$2.5 million. In March 2020, we were awarded a supplemental research funding grant from NIH of up to \$374,000. These non-dilutive research grants are intended to strengthen our clinical program of simufilam, our investigational drug to treat Alzheimer's disease. All of our NIH research grant awards are paid out on a reimbursement basis and require milestone-based technical progress.

2020 Cash Incentive Bonus Plan Obligations

In August 2020, the Board approved the *2020 Cash Incentive Bonus Plan* (the Plan). The Plan was established to promote the long-term success of the Company by creating an "at-risk" cash bonus program that rewards Plan participants with additional cash compensation in lockstep with significant increases in the Company's market capitalization. The Plan is considered "at-risk" because Plan participants will not receive a cash bonus unless the Company's market capitalization increases significantly and certain other conditions specified in the Plan are met. Specifically, Plan participants will not be paid any cash bonuses unless (1) the Company completes a merger or acquisition transaction that constitutes a sale of ownership of the Company or its assets (a Merger Transaction) or (2) the Compensation Committee determines the Company has sufficient cash on hand, as defined in the Plan. Plan participants will be paid all earned cash bonuses in the event of a Merger Transaction.

The Company's market capitalization, including all outstanding stock options, was \$89.4 million at the inception of the Plan in August 2020. If the Company were to exceed a \$5 billion market capitalization for no less than 20 consecutive trading days, and conditions noted above for payment are met, all Plan milestones would be deemed achieved, in which case total cash bonus awards would range from a minimum of \$139.1 million up to a hypothetical maximum of \$322.3 million.

The Company's potential financial obligation to plan participants at December 31, 2021 totaled \$7.3 million, based upon the achievement of one Plan milestone in the Company's market capitalization in 2020. No actual cash bonus payments have been made to any Plan participant, as the Company has not yet satisfied all the conditions necessary for amounts to be paid under the Plan. During the year ended December 31, 2021, the Company's market capitalization increased substantially. These increases triggered the achievement of 11 additional Plan milestones. Collectively, the achievement of such milestones could trigger potential Company obligations to Plan participants ranging from a minimum of \$93.7 million up to a hypothetical

maximum of \$225.0 million, with exact amounts to be determined by the Compensation Committee and contingent upon future satisfaction of a Performance Condition.

No actual cash payments were authorized or made to participants under the Plan as of December 31, 2021, or through the filing date of this Annual Report on Form 10-K.

Use of Cash

Net cash used in operating activities was \$30.2 million for the year ended December 31, 2021, resulting primarily from the net loss reported of \$32.4 million and an increase in prepaid and other assets of \$11.0 million, partially offset by an increase in accounts payable of \$6.2 million, accrued development expense of \$2.1 million, accrued compensation and benefits of \$1.8 million, other current liabilities of \$0.7 million and stock-based compensation expense of \$1.8 million.

Net cash used in operating activities was \$5.4 million for the year ended December 31, 2020, resulting primarily from the net loss reported of \$6.3 million and a gain on sale of property and equipment of \$0.3 million, partially offset by stock-based compensation expense of \$1.0 million and changes in operating assets and liabilities of \$0.3 million.

Net cash used in investing activities during the year ended December 31, 2021 was \$22.2 million related primarily to the purchase of a two-building office complex in Austin, Texas, which will serve as our future corporate headquarters.

Net cash provided by investing activities during the year ended December 31, 2020 was \$360,000 for proceeds received from the sale of property and equipment.

Net cash provided by financing activities during the year ended December 31, 2021 was \$192.3 million, consisting of \$189.8 million in proceeds from our registered direct offering of common stock in February 2021, \$1.8 million from the exercise of stock options and \$0.7 million in proceeds from the exercise of common stock warrants.

Net cash provided by financing activities during the year ended December 31, 2020 was \$75.4 million consisting of \$70.3 million proceeds from our follow-on public offering of common stock in November 2020, \$4.9 million proceeds from exercise of common stock warrants and \$0.3 million from exercise of stock options.

Realization of our deferred tax assets is dependent on future earnings, if any. We are uncertain about the timing and amount of any future earnings. Accordingly, we offset these net deferred tax assets with a valuation allowance.

We lease approximately 6,000 square feet of office space pursuant to a non-cancelable operating lease in Austin, Texas that expires in April 2024. We also lease an additional 3,600 square feet of office space in Austin, Texas that expires on April 30, 2022. Future lease payments are as follows (in thousands):

For the year ending December 31,	
2022	123
2023	107
2024	36
Total future lease payments	<u>\$ 266</u>

We have an accumulated deficit of \$207.3 million at December 31, 2021. We expect our cash requirements to be significant in the future. The amount and timing of our future cash requirements will depend on regulatory and market acceptance of our product candidates and the resources we devote to researching and developing, formulating, manufacturing, commercializing and supporting our products. We believe that our current resources should be sufficient to fund our operations for at least the next 12 months. We may seek additional future funding through public or private financing in the future, if such funding is available and on terms acceptable to us.

If we raise additional funds by issuing debt financing or equity securities, our stockholders will experience dilution. Any future debt financing into which we enter may impose upon us additional covenants that restrict our operations, including limitations on our ability to incur liens or additional debt, pay dividends, repurchase our common stock, make certain investments and engage in certain merger, consolidation or asset sale transactions. Any debt financing or additional equity that we raise may contain terms that are not favorable to us or our stockholders. If we are unable to raise additional funds

when needed, we may be required to delay, reduce, or terminate some or all of our development programs and clinical trials. We may also be required to sell or license to others rights to our drug candidates in certain territories or indications that we would prefer to develop and commercialize ourselves.

Item 7A. *Quantitative and Qualitative Disclosures about Market Risk*

Pursuant to Item 305(e) of Regulation S-K, the information called for by Item 7A is not required.

Item 8. *Consolidated Financial Statements and Supplementary Data*

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Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Cassava Sciences, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Cassava Sciences, Inc. (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations, 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.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 28, 2022 expressed an unqualified opinion thereon.

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 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. 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.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Description of the Matter

Accrued Development Expenses – Patient Clinical Trials

As explained in Note 2 to the consolidated financial statements, the Company has various research and development contracts with research institutions and other third-party vendors to assist in the conducting of patient clinical trials, the costs for which are recorded as research and development expenses as incurred. At December 31, 2021, accrued development expense for patient clinical trials totaled \$988 thousand.

Auditing the Company’s accrued development expense for patient clinical trials was challenging because the accrual involved a higher degree of management judgment to estimate costs incurred but not yet billed at the end of the reporting period. An estimate of the costs incurred was necessary due to the long duration of the clinical trials and the delayed timing of invoices received from third parties.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the Company’s accounting for accrued development expenses for the patient clinical trials process, including controls over management’s review of clinical trial activity progress in comparison to budgets and invoices received from third parties.

To evaluate the adequacy of the Company’s accrued development expense for patient clinical trials, our audit procedures included, among others, testing the accuracy and completeness of the underlying data used in the estimate, evaluating the significant assumptions used by management to estimate the accrual, and evaluating other factors that could impact the accrual such as invoices received. To evaluate the significant assumptions (i.e., progress of patient clinical trials, estimating costs incurred), on a sample basis, we: (i) obtained confirmation directly from third parties of key clinical trial contract terms and conditions, the number of patients enrolled, and costs incurred, (ii) agreed information used in the estimate to the contracts with third parties and any amendments thereto, and (iii) corroborated the progress of clinical trials through inquiry of Company personnel who oversee research and development efforts. We also obtained and reviewed subsequent invoices received from third parties to corroborate the accrual at the end of the reporting period.

Description of the Matter

Loss Contingencies

The Company is subject to lawsuits, claims, allegations and investigations regarding simufilam. As described in Note 12 to the consolidated financial statements, such allegations and claims could result in adverse consequences. As further described in Note 12, at December 31, 2021, the Company was unable to estimate the possible loss or range of loss, if any, associated with these lawsuits and investigations.

Auditing management’s accounting for and disclosure of loss contingencies related to the lawsuits and investigations was challenging because management’s evaluation of the likelihood of losses required significant judgment.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the evaluation of the accounting for and disclosure of these matters. This included controls over management’s assessment of the probability of incurrence of a loss and whether the loss or range of loss was reasonably estimable, and the development of related disclosures.

Our audit procedures included gaining an understanding of the status of ongoing lawsuits and investigations, reading the minutes of the meetings of the committees of the board of directors, reading summaries of the proceedings and related correspondence, requesting inquiry letters from external legal counsel, meeting with external legal counsel to discuss developments related to the lawsuits and investigations together with our forensic professionals, and obtaining written representations from the Company on these matters. We also evaluated the Company’s disclosures in relation to these matters.

/s/ Ernst & Young LLP

We have served as the Company’s auditor since 2002.
Austin, Texas
February 28, 2022

CASSAVA SCIENCES, INC.

CONSOLIDATED BALANCE SHEETS

(In thousands, except share and par value data)

	December 31,	
	2021	2020
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 233,437	\$ 93,506
Prepaid expenses and other current assets	11,045	488
Total current assets	244,482	93,994
Operating lease right-of-use assets	210	295
Property and equipment, net	20,616	11
Intangible assets, net	1,075	—
Other assets	399	—
Total assets	\$ 266,782	\$ 94,300
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 7,126	\$ 911
Accrued development expense	2,803	719
Accrued compensation and benefits	1,877	83
Operating lease liabilities, current	97	58
Other current liabilities	631	94
Total current liabilities	12,534	1,865
Operating lease liabilities, non-current	139	235
Other non-current liabilities	194	—
Total liabilities	12,867	2,100
Commitments and contingencies (Notes 10, 11 and 12)		
Stockholders' equity:		
Preferred stock, \$0.001 par value; 10,000,000 shares authorized, none issued and outstanding	—	—
Common stock, \$0.001 par value; 120,000,000 shares authorized; 40,016,792 and 35,237,987 shares issued and outstanding at December 31, 2021 and 2020, respectively	40	35
Additional paid-in capital	461,181	267,086
Accumulated deficit	(207,306)	(174,921)
Total stockholders' equity	253,915	92,200
Total liabilities and stockholders' equity	\$ 266,782	\$ 94,300

See accompanying notes to consolidated financial statements.

CASSAVA SCIENCES, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

(In thousands, except per share data)

	Year ended December 31,	
	2021	2020
Operating expenses:		
Research and development, net of grant reimbursement	\$ 24,813	\$ 3,053
General and administrative	8,055	3,739
Gain on sale of property and equipment	—	(346)
Total operating expenses	<u>32,868</u>	<u>6,446</u>
Operating loss	(32,868)	(6,446)
Interest income	49	112
Other income, net	434	—
Net loss	<u>\$ (32,385)</u>	<u>\$ (6,334)</u>
Net loss per share, basic and diluted	<u>\$ (0.82)</u>	<u>\$ (0.24)</u>
Shares used in computing net loss per share, basic and diluted	<u>39,405</u>	<u>26,105</u>

See accompanying notes to consolidated financial statements.

CASSAVA SCIENCES, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(In thousands)

	Common stock		Additional paid-in capital	Accumulated other comprehensive income	Accumulated deficit	Total stockholders' equity
	Shares	Par value				
Balance at December 31, 2019	21,841,810	\$ 22	\$ 190,664	\$ —	\$ (168,587)	\$ 22,099
Stock-based compensation for:						
Stock options for employees	—	—	961	—	—	961
Stock options for non-employees	—	—	27	—	—	27
Issuance of common stock pursuant to exercise of stock options	71,105	—	256	—	—	256
Issuance of common stock pursuant to exercise of warrants	3,950,072	4	4,936	—	—	4,940
Common stock issued in conjunction with follow-on public offering, net of issuance costs	9,375,000	9	70,242	—	—	70,251
Net loss	—	—	—	—	(6,334)	(6,334)
Balance at December 31, 2020	<u>35,237,987</u>	<u>35</u>	<u>267,086</u>	<u>—</u>	<u>(174,921)</u>	<u>\$ 92,200</u>
Stock-based compensation for:						
Stock options for employees	—	—	1,706	—	—	1,706
Stock options for non-employees	—	—	53	—	—	53
Issuance of common stock pursuant to exercise of stock options	143,153	—	1,824	—	—	1,824
Issuance of common stock pursuant to exercise of warrants	554,019	1	691	—	—	692
Common stock issued in conjunction with registered direct offering, net of issuance costs	4,081,633	4	189,821	—	—	189,825
Net loss	—	—	—	—	(32,385)	(32,385)
Balance at December 31, 2021	<u>40,016,792</u>	<u>\$ 40</u>	<u>\$ 461,181</u>	<u>\$ —</u>	<u>\$ (207,306)</u>	<u>\$ 253,915</u>

See accompanying notes to consolidated financial statements.

CASSAVA SCIENCES, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year ended December 31,	
	2021	2020
Cash flows from operating activities:		
Net loss	\$ (32,385)	\$ (6,334)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation	1,759	988
Depreciation	310	22
Amortization of intangible assets	224	—
Gain on sale of property and equipment	—	(346)
Changes in operating assets and liabilities:		
Prepaid and other assets	(10,956)	(220)
Operating lease right-of-use assets and liabilities	28	(2)
Accounts payable	6,215	458
Accrued development expense	2,084	(58)
Accrued compensation and benefits	1,794	25
Other liabilities	731	85
Net cash used in operating activities	<u>(30,196)</u>	<u>(5,382)</u>
Cash flows from investing activities:		
Purchase of property and equipment	(22,214)	—
Proceeds from sale of property and equipment	—	360
Net cash (used in) provided by investing activities	<u>(22,214)</u>	<u>360</u>
Cash flows from financing activities:		
Proceeds from issuance of common stock upon exercise of stock options	1,824	256
Proceeds from issuance of common stock upon exercise of common stock warrants	692	4,940
Proceeds from common stock offering, net of issuance costs	189,825	70,251
Net cash provided by financing activities	<u>192,341</u>	<u>75,447</u>
Net increase in cash and cash equivalents	139,931	70,425
Cash and cash equivalents at beginning of period	93,506	23,081
Cash and cash equivalents at end of period	<u>\$ 233,437</u>	<u>\$ 93,506</u>

See accompanying notes to consolidated financial statements.

CASSAVA SCIENCES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. General, Liquidity and Basis of Presentation

Cassava Sciences, Inc. and its wholly-owned subsidiary (collectively referred to as the “Company”) discovers and develops proprietary pharmaceutical product candidates that may offer significant improvements to patients and healthcare professionals. The Company generally focuses its product discovery and development efforts on disorders of the nervous system.

Coronavirus Disease 2019 (COVID-19)

The widespread outbreak of a novel infectious disease called Coronavirus Disease 2019, or COVID-19, has not significantly impacted the Company’s operations or financial condition as of February 28, 2022. However, this pandemic has created a dynamic and uncertain situation in the national economy. The Company continues to closely monitor the latest information to make timely, informed business decisions and public disclosures regarding the potential impact of pandemic on its operations and financial condition. The scope of pandemic is unprecedented and its long-term impact on the Company’s operations and financial condition cannot be reasonably estimated at this time.

Basis of Consolidation

The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiary. All intercompany transactions have been eliminated in consolidation.

Liquidity

The Company has incurred significant net losses and negative cash flows since inception, and as a result has an accumulated deficit of \$207.3 million at December 31, 2021. The Company expects its cash requirements to be significant in the future. The amount and timing of the Company’s future cash requirements will depend on regulatory and market acceptance of its product candidates and the resources it devotes to researching and developing, formulating, manufacturing, commercializing and supporting its products. The Company may seek additional funding through public or private financing in the future, if such funding is available and on terms acceptable to the Company. There are no assurances that additional financing will be available on favorable terms, or at all. However, management believes that the current working capital position will be sufficient to meet the Company’s working capital needs for at least the next 12 months.

2. Summary of Significant Accounting Policies

Use of Estimates

The Company makes estimates and assumptions in preparing its consolidated financial statements in conformity with accounting principles generally accepted in the United States. These estimates and assumptions affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amount of revenue earned and expenses incurred during the reporting period. The Company evaluates its estimates on an ongoing basis, including those estimates related to manufacturing agreements and research collaborations. Actual results could differ from these estimates and assumptions.

Proceeds from Grants

In 2021, the Company received \$3.9 million of reimbursement from the National Institutes of Health and National Institute on Drug Abuse and \$4.2 million in 2020. The Company records the proceeds from these grants as reductions to its research and development expenses.

Cash and Cash Equivalents and Concentration of Credit Risk

The Company invests in cash and cash equivalents. The Company considers highly-liquid financial instruments with original maturities of three months or less to be cash equivalents. Highly liquid investments that are considered cash equivalents include money market accounts and funds, certificates of deposit and U.S. Treasury securities. The Company maintains its cash and cash equivalents at one financial institution.

Fair Value Measurements

The Company recognizes financial instruments in accordance with the authoritative guidance on fair value measurements and disclosures for financial assets and liabilities. This guidance defines fair value, establishes a framework for measuring fair value in accordance with GAAP, and expands disclosures about fair value measurements. The guidance also establishes a three-tier fair value hierarchy, which prioritizes the inputs used in measuring fair value. These tiers include:

- Level 1 includes quoted prices in active markets.
- Level 2 includes significant observable inputs, such as quoted prices for identical or similar securities, or other inputs that are observable and can be corroborated by observable market data for similar securities. The Company uses market pricing and other observable market inputs obtained from third-party providers. It uses the bid price to establish fair value where a bid price is available. The Company does not have any financial instruments where the fair value is based on Level 2 inputs.
- Level 3 includes unobservable inputs that are supported by little or no market activity. The Company does not have any financial instruments where the fair value is based on Level 3 inputs.

If a financial instrument uses inputs that fall in different levels of the hierarchy, the instrument will be categorized based upon the lowest level of input that is significant to the fair value calculation. The fair value of cash and cash equivalents was based on Level 1 inputs at December 31, 2021 and 2020.

Business Segments

The Company reports segment information based on how it internally evaluates the operating performance of its business units, or segments. The Company's operations are confined to one business segment: the development of novel drugs and diagnostics.

Stock-based Compensation

The Company recognizes non-cash expense for the fair value of all stock options and other share-based awards. The Company uses the Black-Scholes option valuation model ("Black-Scholes") to calculate the fair value of stock options, using the single-option award approach and straight-line attribution method. This model requires the input of subjective assumptions including expected stock price volatility, expected life and estimated forfeitures of each award. These assumptions consist of estimates of future market conditions, which are inherently uncertain, and therefore, are subject to management's judgment. For all options granted, it recognizes the resulting fair value as expense on a straight-line basis over the vesting period of each respective stock option, generally four years.

The Company has granted share-based awards that vest upon achievement of certain performance criteria ("Performance Awards"). The Company multiplies the number of Performance Awards by the fair value of its common stock on the date of grant to calculate the fair value of each award. It estimates an implicit service period for achieving performance criteria for each award. The Company recognizes the resulting fair value as expense over the implicit service period when it concludes that achieving the performance criteria is probable. It periodically reviews and updates as appropriate its estimates of implicit service periods and conclusions on achieving the performance criteria. Performance Awards vest and common stock is issued upon achievement of the performance criteria.

Net Loss per Share

The Company computes basic net loss per share on the basis of the weighted-average number of common shares outstanding for the reporting period. Diluted net loss per share is computed on the basis of the weighted-average number of common shares outstanding plus potential dilutive common shares outstanding using the treasury-stock method. Potential dilutive common shares consist of outstanding common stock options and warrants. There is no difference between the Company's net loss and comprehensive loss. The numerators and denominators in the calculation of basic and diluted net loss per share were as follows (in thousands, except net loss per share data):

	Year ended	
	December 31,	
	2021	2020
Numerator:		
Net loss	\$ (32,385)	\$ (6,334)
Denominator:		
Shares used in computing net loss per share, basic and diluted	39,405	26,105
Net loss per share, basic and diluted	<u>\$ (0.82)</u>	<u>\$ (0.24)</u>
Dilutive common stock options excluded from net loss per share, diluted	2,211	2,145
Common stock warrants excluded from net loss per share, diluted	—	554

The Company excluded common stock options and warrants outstanding from the calculation of net loss per share, diluted, because the effect of including outstanding options and warrants would have been anti-dilutive.

Fair Value of Financial Instruments

Financial instruments include accounts payable and accrued liabilities. The estimated fair value of certain financial instruments may be determined using available market information or other appropriate valuation methodologies. However, considerable judgment is required in interpreting market data to develop estimates of fair value; therefore, the estimates are not necessarily indicative of the amounts that could be realized or would be paid in a current market exchange. The effect of using different market assumptions and/or estimation methodologies may be material to the estimated fair value amounts. The carrying amounts of accounts payable and accrued liabilities are at cost, which approximates fair value due to the short maturity of those instruments.

Research Contract Costs and Accruals

The Company has entered into various research and development contracts with research institutions and other third-party vendors. These agreements are generally cancelable. Related payments are recorded as research and development expenses as incurred. The Company records accruals for estimated ongoing research costs. When evaluating the adequacy of the accrued liabilities, the Company analyzes progress of the studies including the phase or completion of events, invoices received and contracted costs. Significant judgments and estimates are made in determining the accrued balances at the end of any reporting period. Actual results could differ from the Company's estimates. The Company's historical accrual estimates have not been materially different from actual costs.

Incentive Bonus Plan

In 2020, the Company established the 2020 Cash Incentive Bonus Plan (the "Plan") to incentivize Plan participants. Awards under the Plan are accounted for as liability awards under Accounting Standards Codification (ASC) 718 "*Stock-based Compensation*". The fair value of each potential Plan award will be determined once a grant date occurs and will be remeasured each reporting period. Compensation expense associated with the Plan will be recognized over the expected achievement period for each Plan award, when a Performance Condition (as defined below) is considered probable of being met. See Note 11 for further discussion of the Plan.

Leases

The Company recognizes assets and liabilities that arise from leases. For operating leases, the Company is required to recognize a right-of-use asset and a lease liability, initially measured at the present value of the lease payments during the lease term, in the consolidated balance sheets. The Company elected the short-term lease recognition exemption for all leases that qualify. This means, for those leases that qualify, the Company does not recognize right-of-use assets or lease liabilities. As the Company's leases do not provide an implicit rate, it uses its incremental borrowing rate based on the information available at the commencement date in determining the present value of lease payments. Lease expense for lease payments is recognized on a straight-line basis over the lease term.

Property and equipment

Property and equipment is recorded at cost, net of accumulated depreciation. Depreciation is recorded using the straight-line method over the estimated useful lives of the assets. Buildings and site improvements have estimated useful lives of 39 years and 9 years, respectively. Tenant improvements are amortized using the straight-line method over the useful lives of the improvements or the remaining term of the corresponding leases, whichever is shorter. The remaining term of the corresponding leases is approximately 2.8 years.

Property and equipment are reviewed for impairment when events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. If property and equipment are considered to be impaired, an impairment loss is recognized.

Intangible assets

Acquired intangible assets are recorded at fair value at the date of acquisition and primarily consist of lease-in-place agreements and leasing commissions. Intangible assets are amortized over the estimated life of the lease-in-place agreements, which approximates 2.7 years.

Intangible assets are reviewed for impairment on an annual basis, and when there is reason to believe that their values have been diminished or impaired. If intangible assets are considered to be impaired, an impairment loss is recognized.

Income Taxes

The Company accounts for income taxes under the asset and liability method. Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred tax balances are adjusted to reflect tax rates based on currently enacted tax laws, which will be in effect in the years in which the temporary differences are expected to reverse. The Company has accumulated significant deferred tax assets that reflect the tax effects of net operating loss and tax credit carryovers and temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Realization of certain deferred tax assets is dependent upon future earnings. The Company is uncertain about the timing and amount of any future earnings. Accordingly, the Company offsets these deferred tax assets with a valuation allowance.

The Company accounts for uncertain tax positions in accordance with ASC 740, "Income Taxes", which clarifies the accounting for uncertainty in tax positions. These provisions require recognition of the impact of a tax position in the Company's financial statements only if that position is more likely than not of being sustained upon examination by taxing authorities, based on the technical merits of the position. Any interest and penalties related to uncertain tax positions will be reflected as a component of income tax expense.

Recent Accounting Pronouncements

The Company reviewed recently issued accounting pronouncements and plan to adopt those that are applicable to it, and does not expect the adoption of these pronouncements to have a material impact on its financial position, results of operations or cash flows.

In June 2016, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update No. 2016-13 (“ASU 2016-13”) *Financial Instruments—Credit Losses (Topic 326): Measurement of credit losses on financial instruments*. ASU 2016-13 introduces the current expected credit losses methodology for estimating allowances for credit losses. The standard is effective in fiscal years and interim periods beginning after December 15, 2020. The adoption of ASU 2016-13 in the first quarter of 2021 did not have a material impact on its consolidated financial statements and related disclosures.

In December 2019, the FASB issued Accounting Standards Update No. 2019-12 (“ASU 2019-12”), *Income Taxes (Topic 740) Simplifying Accounting for Income Taxes*, as part of its initiative to reduce complexity in the accounting standards. The guidance amended certain disclosure requirements that had become redundant, outdated or superseded. Additionally, this guidance amends accounting for the interim period effects of changes in tax laws or rates, and simplifies aspects of the accounting for franchise taxes. The guidance is effective for annual periods beginning after December 15, 2020, including interim periods therein. The adoption of ASU 2019-12 in the first quarter of 2021 did not have a material impact on the Company’s consolidated financial statements.

3. Prepaid and Other Current Assets

Prepaid and other current assets at December 31, 2021 and 2020 consisted of the following (in thousands):

	December 31,	
	2021	2020
Prepaid insurance	\$ 662	\$ 457
Contract research organization and other deposits	10,330	—
Other	53	31
Total prepaid expenses and other current assets	<u>\$ 11,045</u>	<u>\$ 488</u>

Contract research organization and other deposits represent cash payments made to vendors in excess of expenses incurred.

4. Real Property Acquisition

On August 4, 2021, the Company completed the all-cash purchase of a two-building office complex in Austin, Texas, which will serve as its future corporate headquarters. This property is intended to accommodate the Company’s anticipated growth and expansion of its operations in the coming years. Maintenance, physical facilities, leasing, property management and other key responsibilities related to property ownership are being outsourced to professional real-estate managers. The purchase price of the property was \$22.0 million, including transaction costs. The office complex measures approximately 90,000 rentable square feet. At acquisition and December 31, 2021, the property was 59% leased. The Company is planning to occupy approximately 25% of the property in 2022. The seller was a third party not affiliated with the Company.

The purchase was accounted for as an asset acquisition under ASC 805, Business Combinations. As substantially all of the fair value of the gross assets acquired were concentrated into a single identifiable asset, the Company concluded that the screen was met, and the transaction is considered an asset acquisition rather than an acquisition of a business. Pursuant to the cost accumulation method as prescribed in ASC 805, the cost of the acquisition, including certain transaction costs, is allocated to the assets acquired on the basis of relative fair values. The value of acquired in-place leases is measured as the sum of lost revenues that would be incurred during a prospective lease-up period that would be necessary to achieve occupancy similar to that at the time of acquisition. The value is calculated as the average number of months of lease-up multiplied by the gross monthly market rental rate (base rent plus reimbursements) for each particular suite.

The assets acquired are summarized as follows (in thousands):

Land	\$	3,734
Buildings		15,980
Site improvements		453
Tenant improvements		567
Total tangible assets	\$	<u>20,734</u>
Lease-in-place agreements	\$	1,053
Leasing commissions and other		246
Total intangible assets	\$	<u>1,299</u>
Consideration paid	\$	<u>22,033</u>

The Company records the net income from building operations and leases as other income, net, as leasing is not core to the Company's operations. Building depreciation and amortization is included in general and administrative expense. Components of other income, net, for the years ended December 31, 2021 and 2020 were as follows (in thousands):

	Year ended December 31,		
	2021		2020
Lease revenue	\$	911	\$ —
Property operating expenses		(477)	—
Other income, net	\$	<u>434</u>	<u>\$ —</u>

5. Property and Equipment

The components of property and equipment, net, as of December 31, 2021 and 2020 were as follows (in thousands):

	December 31,		
	2021		2020
Land	\$	3,734	\$ —
Buildings		15,980	—
Site improvements		470	—
Tenant improvements		567	—
Furniture and equipment		178	97
Construction in progress		83	—
Gross property and equipment	\$	21,012	\$ 97
Accumulated depreciation		(396)	(86)
Property and equipment, net	\$	<u>20,616</u>	<u>\$ 11</u>

Depreciation expense for property and equipment was \$310,000 and \$22,000 for the years ended December 31, 2021 and 2020, respectively.

There were no sales of property and equipment during the year ended December 31, 2021.

During the year ended December 31, 2020, the Company sold surplus manufacturing equipment to an independent third party and received proceeds totaling \$360,000. The original cost of the property and equipment was \$892,000 and accumulated depreciation was \$878,000, resulting a gain on sale of property and equipment of \$346,000 during the year ended December 31, 2020.

6. Intangible assets

The components of intangible assets, net, as of December 31, 2021 and 2020 were as follows (in thousands):

	December 31,	
	2021	2020
Lease-in-place agreements	\$ 1,053	\$ —
Leasing commissions and other	246	—
Gross intangible assets	\$ 1,299	\$ —
Accumulated amortization	(224)	—
Intangible assets, net	\$ 1,075	\$ —

Amortization expense for intangible assets was \$224,000 for the year ended December 31, 2021. There was no amortization expense for the year ended December 31, 2020.

Amortization expense for finite-lived intangible assets is expected to be as follows (in thousands):

<u>For the year ending December 31,</u>	
2022	464
2023	464
2024	147
Total amortization	<u>\$ 1,075</u>

7. Stockholders' Equity and Stock-Based Compensation

Preferred Stock

The Company's Board of Directors (the "Board") has the authority to issue preferred stock in one or more series and to fix the rights, preferences, privileges, restrictions and the number of shares constituting any series or the designation of the series.

2021 Registered Direct Offering

On February 12, 2021, the Company completed a common stock offering pursuant to which certain investors purchased 4,081,633 shares of common stock at a price of \$49.00 per share. Net proceeds of the offering were approximately \$189.8 million after deducting offering expenses.

2020 Follow-on Public Offering

On November 13, 2020, the Company completed the sale of 9,375,000 shares of Cassava common stock in an underwritten public offering at a price of \$8.00 per share. The Company received net proceeds from the offering of approximately \$70.3 million after deducting underwriting discounts and offering expenses.

Common Stock Warrants

In August 2018, the Company issued warrants to purchase up to an aggregate of 9.1 million shares of its common stock in conjunction with an offering of its common stock.

During 2021, the Company received proceeds of \$0.7 million from the exercise of 0.6 million shares pursuant to common stock warrants. There were no common stock warrants outstanding following the 2021 exercises.

During 2020, the Company received proceeds of \$4.9 million from the exercise of 4.0 million shares pursuant to common stock warrants.

At the Market (ATM) Common Stock Issuance

On March 27, 2020, the Company established an at-the-market offering program (ATM) to sell, from time to time, shares of Company common stock having an aggregate offering price of up to \$100 million in transactions pursuant to a shelf registration statement that was declared effective by the U.S. Securities and Exchange Commission (the SEC) on May 5, 2020. The Company is obligated to pay a commission of 3.0% of the gross proceeds from the sale of shares of common stock in the offering. The Company is not obligated to sell any shares in the offering.

There were no common stock sales under the ATM during the years ended December 31, 2021 and 2020.

2008 Equity Incentive Plan

Under the Company's 2008 Equity Incentive Plan, or 2008 Equity Plan, its employees, directors and consultants received share-based awards, including grants of stock options and performance awards. The 2008 Equity Plan expired in December 2017. Share-based awards generally expire ten years from the date of grant.

2018 Equity Incentive Plan

In January 2018, the Company's Board approved the Company's 2018 Omnibus Incentive Plan (the 2018 Plan). The Company's Board or a designated Committee of the Board is responsible for administration of the 2018 Plan and determined the terms and conditions of each option granted, consistent with the terms of the 2018 Plan. The Company's employees, directors, and consultants are eligible to receive awards under the 2018 Plan, including grants of stock options and performance awards. Share-based awards generally expire ten years from the date of grant. The 2018 Plan provides for issuance of up to 1,000,000 shares of common stock, par value \$0.001 per share under the 2018 Plan, subject to adjustment as provided in the 2018 Plan.

When stock options or performance awards are exercised net of the exercise price and taxes, the number of shares of stock issued is reduced by the number of shares equal to the amount of taxes owed by the award recipient and that number of shares are cancelled. The Company then uses its cash to pay tax authorities the amount of statutory taxes owed by and on behalf of the award recipient.

Stock Options

The following summarizes information about stock option activity during 2021:

	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term in Years	Aggregate Intrinsic Value in Millions
Outstanding as of December 31, 2020	2,817,504	\$ 11.30	5.60	\$ 6.4
Options granted	100,000	69.20		
Options exercised	(241,638)	30.75		
Options forfeited/canceled	(12,139)	44.01		
Outstanding as of December 31, 2021	<u>2,663,727</u>	11.56	5.13	\$ 88.2
Vested and expected to vest at December 31, 2021	<u>2,663,727</u>	11.56	5.13	\$ 88.2
Exercisable at December 31, 2021	<u>2,294,190</u>	\$ 10.52	4.63	\$ 76.5

The following summarizes information about stock options at December 31, 2021 by a range of exercise prices:

Range of exercise prices		Options outstanding			Options exercisable	
		Number of outstanding options	Weighted average remaining contractual life (in years)	Weighted average exercise price	Number of vested options	Weighted average exercise price
From	To					
\$ 0.95	\$ 1.88	657,813	7.4	\$ 1.47	415,363	\$ 1.37
\$ 3.24	\$ 3.24	550,000	5.6	\$ 3.24	550,000	\$ 3.24
\$ 4.09	\$ 12.04	547,576	5.2	\$ 7.06	506,638	\$ 7.02
\$ 12.39	\$ 23.38	597,746	2.3	\$ 16.77	597,746	\$ 16.77
\$ 23.59	\$ 77.00	310,592	4.6	\$ 45.53	224,443	\$ 36.50
		<u>2,663,727</u>	5.1	\$ 11.56	<u>2,294,190</u>	\$ 10.52

The Company uses Black-Scholes to estimate the fair value of options granted. Black-Scholes considers a number of factors, including the market price of the Company's common stock. Factors utilized in Black-Scholes to value each stock option granted, and the weighted average fair value of options granted during the years ended December 31, 2021 and 2020 were as follows:

	2021	2020
Volatility	147% to 151%	123% to 139%
Risk-free interest rates	1.12% to 1.42%	0.46% to 0.78%
Expected life of option	7.0 years	7.0 years
Dividend yield	zero	zero
Forfeiture rate	zero	zero
Weighted average fair value of stock options granted	\$65.83	\$6.69

Volatility is based on reviews of the historical volatility of the Company's common stock. Risk-free interest rates are based on yields of U.S. treasury notes in effect at the date of grant. Expected life of option is based on actual historical option exercises. Dividend yield is zero because the Company does not anticipate paying cash dividends in the foreseeable future.

As of December 31, 2021, the Company expects to recognize compensation expense of \$6.2 million related to non-vested options held by equity plan participants over the weighted average remaining recognition period of 2.1 years.

Performance Awards

The following summarizes information about performance award activity during 2021:

	Number of Performance Awards
Outstanding as of December 31, 2020	138,055
Granted	—
Vested	—
Forfeited/canceled	—
Outstanding as of December 31, 2021	<u>138,055</u>

If and when outstanding performance awards vest, the Company would recognize \$2.3 million in stock-based compensation expense. These performance awards expire between 2022 and 2026.

Stock-Based Compensation Expense

The following summarizes information about stock-based compensation expense, in thousands:

	Year ended December 31,	
	2021	2020
Research and development	\$ 1,302	\$ 453
General and administrative	457	535
Total stock-based compensation expense	<u>\$ 1,759</u>	<u>\$ 988</u>

8. Employee 401(k) Benefit Plan

The Company has a defined-contribution savings plan under Section 401(k) of the Internal Revenue Code. The plan covers substantially all employees. Employees are eligible to participate in the plan the first day of the month after hire and may contribute up to the current statutory limits under Internal Revenue Service regulations. The 401(k) plan permits the Company to make additional matching contributions on behalf of all employees. Through December 31, 2021, the Company has not made any matching contributions to the 401(k) plan.

9. Income Taxes

The Company did not provide for income taxes in 2021 and 2020 because it had book and federal taxable losses in those years and the tax benefit that would have resulted from the pre-tax losses was fully offset by a change in the valuation allowance.

The reconciliation of the statutory federal income tax rate to the Company's effective tax rate for the years ended December 31, 2021 and 2020 was as follows:

	Year ended December 31,	
	2021	2020
Tax at federal statutory rate	21.0 %	21.0 %
State tax, net of federal benefit	—	—
Share-based compensation	1.2	(42.8)
Research and development credits	2.3	1.6
Section 162(m) limitation	(0.5)	—
Other	(0.2)	—
Change in valuation allowance	(23.8)	20.2
Effective income tax rate	<u>— %</u>	<u>— %</u>

Deferred tax assets and valuation allowance

Deferred tax assets reflect the tax effects of net operating loss and tax credit carryforwards and temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. The Company's deferred taxes assets at December 31, 2021 and 2020 were valued at the corporate tax rate of 21%. The Company offsets its deferred tax assets by a valuation allowance because it is uncertain about the timing and amount of any future profits. Significant components of its deferred tax assets are as follows (in thousands):

	December 31,	
	2021	2020
Deferred tax assets:		
Net operating loss carryforwards	\$ 24,777	\$ 18,333
Share-based compensation	2,870	3,230
Research and development credit carryforwards	7,439	6,687
Other	1,130	264
Total deferred tax assets	36,216	28,514
Valuation allowance	(36,166)	(28,447)
Net deferred tax assets	50	67
Deferred tax liabilities:		
Property and equipment	—	(5)
Operating lease right-of-use assets	(50)	(62)
Total deferred tax liabilities	(50)	(67)
Net deferred tax asset (liability)	\$ —	\$ —

The valuation allowance increased by \$7.7 million in 2021 due primarily to continuing operations.

The valuation allowance decreased by \$1.3 million in 2020 due to continuing operations.

The Company's net operating loss carryforwards of \$118.0 million are federal, of which \$74.1 million expires between 2029 and 2037 and \$43.9 million carries forward indefinitely. As of December 31, 2021, the Company had federal research and development tax credits of approximately \$12.4 million, which expire in the years 2024 through 2041.

Unrecognized tax benefits

As of December 31, 2021 and 2020, the Company has unrecognized tax benefits related to tax credits of \$5.0 million and \$4.5 million, respectively. None of the unrecognized tax benefits as of December 31, 2021, if recognized, would impact the effective tax rate due to the valuation allowance and no interest or penalties have been recognized. A reconciliation of the beginning and ending balance of unrecognized tax benefits is as follows (in thousands):

	Year ended December 31,	
	2021	2020
Beginning balance	\$ 4,500	\$ 4,400
Additions based on tax positions related to the current year	501	100
Ending balance	\$ 5,001	\$ 4,500

As of December 31, 2021, there were no unrecognized tax benefits that we expect would change significantly over the next 12 months.

The Company files U.S. and Texas income tax returns. In the United States, the statute of limitations with respect to the federal income tax returns for tax years after 2017 are open to audit; however, since the Company has net operating losses, the taxing authority has the ability to review tax returns prior to the 2018 tax year and make adjustments to these net operating loss carryforwards. We are not under audit in any taxing jurisdiction at this time.

10. Leases and Commitments

Right-of-use Asset and Liability

The Company has a non-cancelable operating lease for approximately 6,000 square feet of office space in Austin, Texas, which is used for the development of novel products. On September 4, 2020, the Company entered into a lease amendment that extended the lease termination date to April 30, 2024 and set new rental rates effective as of January 1, 2021. The Company also has a short-term lease agreement for an additional 3,600 square feet of office space in Austin, Texas that expires on April 30, 2022. Future lease payments are (in thousands).

	2022	2023	2024	Total future lease payments	Less: imputed interest	Total
Operating leases	\$ 102	107	36	245	(9)	\$ 236
Short-term operating lease	\$ 21	—	—	21	—	\$ 21

Rent expense was \$0.1 million for the year ended December 31, 2021 and 2020.

There were no right-of-use assets exchanged for operating lease liabilities during the year ended December 31, 2021. The Company recorded a right-of-use asset and lease liability of \$316,000 as a result of the lease modification in September 2020. The Company utilized a discount rate of 3.25% for the modified lease to determine the present value of the future lease payments, which approximated the Company's incremental borrowing rate in September 2020.

Cash paid for operating lease liabilities totaled \$109,000 and \$99,000 during the years ended December 31, 2021 and 2020, respectively.

Other Commitments

The Company conducts its product research and development programs through a combination of internal and collaborative programs that include, among others, arrangements with universities, contract research organizations and clinical research sites. It has contractual arrangements with these organizations that are generally cancelable. The Company's obligations under these contracts are largely based on services performed. The Company had non-cancellable commitments for preclinical and clinical studies as well as the manufacture of simufilam totaling approximately \$4.7 million at December 31, 2021.

The Company is dependent on contract development and manufacturing organizations for the manufacture of all our materials for clinical studies.

Note 11. 2020 Cash Incentive Bonus Plan

In August 2020, the Board approved the Plan. The Plan was established to promote the long-term success of the Company by creating an "at-risk" cash bonus program that rewards Plan participants with additional cash compensation in lockstep with significant increases in the Company's market capitalization. The Plan is considered "at-risk" because Plan participants will not receive a cash bonus unless the Company's market capitalization increases significantly and certain other conditions specified in the Plan are met. Specifically, Plan participants will not be paid any cash bonuses unless (1) the Company completes a merger or acquisition transaction that constitutes a sale of ownership of the Company or its assets (a Merger Transaction) or (2) the Compensation Committee of the Board (the Compensation Committee) determines the Company has sufficient cash on hand, as defined in the Plan. Because of the inherent discretion and uncertainty regarding these requirements, the Company has concluded that a Plan grant date has not occurred as of December 31, 2021.

Plan participants will be paid all earned cash bonuses in the event of a Merger Transaction.

The Company's market capitalization for purposes of the Plan is determined based on either (1) the Company's closing price of one share on the Nasdaq Capital Market multiplied by the total issued and outstanding shares and options

to purchase shares of the Company, or (2) the aggregate consideration payable to security holders of the Company in a Merger Transaction. This constitutes a market condition under applicable accounting guidance.

The Plan triggers a potential cash bonus each time the Company's market capitalization increases significantly, up to a maximum \$5 billion in market capitalization. The Plan specifies 14 incremental amounts between \$200 million and \$5 billion (each increment, a "Valuation Milestone"). Each Valuation Milestone triggers a potential cash bonus award in a pre-set amount defined in the Plan. Each Valuation Milestone must be achieved and maintained for no less than 20 consecutive trading days for Plan participants to be eligible for a potential cash bonus award. Approximately 58% of each cash bonus award associated with a Valuation Milestone is subject to adjustment and approval by the Compensation Committee. Any amounts not awarded by the Compensation Committee are no longer available for distribution.

If the Company were to exceed a \$5 billion market capitalization for no less than 20 consecutive trading days, all Valuation Milestones would be deemed achieved, in which case cash bonus awards would range from a minimum of \$139.1 million up to a hypothetical maximum of \$322.3 million. Payment of cash bonuses is deferred until such time as (1) the Company completes a Merger Transaction, or (2) the Compensation Committee determines the Company has sufficient cash on hand to render payment (each, a "Performance Condition"), neither of which may ever occur. Accordingly, there can be no assurance that Plan participants will ever be paid a cash bonus that is awarded under the Plan, even if the Company's market capitalization increases significantly.

The Plan is accounted for as a liability award. The fair value of each Valuation Milestone award will be determined once a grant date occurs and will be remeasured each reporting period. Compensation expense associated with the Plan will be recognized over the expected achievement period for each of the 14 Valuation Milestones, when a Performance Condition is considered probable of being met.

In October 2020, the Company achieved the first Valuation Milestone. Subsequently, the Compensation Committee approved a potential cash bonus award of \$7.3 million in total for all Plan participants, subject to future satisfaction of a Performance Condition.

During the year ended December 31, 2021, the Company achieved 11 additional Valuation Milestones triggering potential Company obligations to all Plan participants from a minimum of \$93.7 million up to a hypothetical maximum of \$225.0 million, to be determined by the Compensation Committee and contingent upon future satisfaction of a Performance Condition. However, no compensation expense has been recorded since no grant date has occurred and no Performance Conditions are considered probable of being met. There is no continuing service requirement for Plan participants once the Compensation Committee approves a cash bonus award.

No actual cash payments were authorized or made to participants under the Plan through December 31, 2021.

12. Contingencies

Securities Class Actions and Shareholder Derivative Action

Between August 27 and October 26, 2021, four putative class action lawsuits were filed alleging violations of the federal securities laws by the Company and certain named officers. The complaints rely on allegations contained in two Citizen Petitions submitted to FDA, and allege that various statements made by the defendants regarding simufilam were rendered materially false and misleading. The two Citizen Petitions were subsequently denied by FDA. These actions were filed in the U.S. District Court for the Western District of Texas. The complaints seek unspecified compensatory damages and other relief on behalf of a purported class of purchasers of the Company's securities between September 14, 2020, and August 27, 2021. The Company expects that the cases will be consolidated and that a lead plaintiff and lead counsel will be appointed and thereafter that a consolidated amended complaint will be filed. The Company believes the lawsuit claims are without merit and intends to defend against these lawsuits vigorously. The Company is unable to estimate the possible loss or range of loss, if any, associated with these lawsuits.

On November 4, 2021, a related shareholder derivative action was filed, purportedly on behalf of the Company, in the U.S. District Court for the Western District of Texas, asserting claims under the U.S. securities laws and state fiduciary

duty laws against certain named officers and the members of the Company's board of directors. The complaint relies on the allegations made in two Citizen Petitions that were submitted to FDA. The two Citizen Petitions, which were subsequently denied by FDA, allege, among other things, that the individual defendants exposed the Company to unspecified damages and securities law liability by causing it to make materially false and misleading statements, in violation of the U.S. securities laws and in breach of their fiduciary duties to the Company. The derivative case seeks, among other things, to recover unspecified compensatory damages on behalf of the Company arising out of the individual defendant's alleged wrongful conduct. Although the plaintiffs in the derivative cases does not seek relief against the Company, it has certain indemnification obligations to the individual defendants. Since November 4, 2021, three additional shareholder derivative actions were filed alleging substantially similar claims, two in the U.S. District Court for the Western District of Texas, and one in Texas state court (Travis County District Court). The state court action has been stayed pending the resolution of the motions to dismiss in the securities class actions. The parties to the three federal court actions have filed a motion, which the court has not yet ruled on, to consolidate and stay pending the resolution of motions to dismiss in the securities class actions. The Company is unable to estimate the possible loss or range of loss, if any, associated with these lawsuits.

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 management, with the participation of our Chief Executive Officer and our Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of the end of the period covered by this Annual Report on Form 10-K. Based on this evaluation, our Chief Executive Officer and our Chief Financial Officer have concluded that our disclosure controls and procedures were effective to ensure that information we are required to disclose in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission, or SEC, rules and forms and that such information is accumulated and communicated to management as appropriate to allow timely decisions regarding required disclosures.

Management's annual report on internal control over financial reporting. Our management is responsible for establishing and maintaining adequate internal control over our financial reporting. Our management has assessed the effectiveness of internal control over financial reporting as of December 31, 2021. Our assessment was based on criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission, or COSO, in Internal Control-Integrated Framework (2013 Framework).

Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external purposes in accordance with generally accepted accounting principles. Our internal control over financial reporting includes those policies and procedures that:

- (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect our transactions and dispositions of our assets;
- (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and board of directors; and
- (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of our assets that could have a material effect on the consolidated financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, 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.

Based on the COSO criteria, we believe our internal control over financial reporting as of December 31, 2021 was effective.

Changes in internal control over financial reporting.

There was no change in our internal control over financial reporting that occurred during the quarter ended December 31, 2021 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

The effectiveness of our internal control over financial reporting as of December 31, 2021 has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in their report which is included herein.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Cassava Sciences, Inc.

Opinion on Internal Control Over Financial Reporting

We have audited Cassava Sciences, Inc.'s internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Cassava Sciences, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of Cassava Sciences, Inc. (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations, stockholders' equity and cash flows for each of the two years in the period ended December 31, 2021, and the related notes and our report dated February 28, 2022 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Controls over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's 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 generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, 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.

/s/ Ernst & Young LLP

Austin, Texas
February 28, 2022

Item 9B. Other Information

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspection

None.

PART III**Item 10. Directors and Executive Officers and Corporate Governance**

The information regarding our directors, executive officers, director nomination process and the audit committee of the Board is incorporated by reference from "Directors and Executive Officers" in our Proxy Statement for our 2022 Annual Meeting of Stockholders.

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Exchange Act requires our executive officers and directors and persons who own more than ten percent (10%) of a registered class of our equity securities to file reports of ownership and changes in ownership with the SEC. Executive officers, directors and greater than ten percent (10%) stockholders are required to furnish us with copies of all Section 16(a) forms they file. We believe all of our executive officers and directors complied with all applicable filing requirements during 2021.

Code of Ethics

We have adopted a Code of Ethics that applies to all of our directors, officers and employees, including our principal executive officer and principal financial officer. We publicize the Code of Ethics through posting the policy on our website, <http://www.cassavasciences.com>. We will disclose on our website any waivers of, or amendments to, our Code of Ethics.

Item 11. Executive Compensation

The information required by this Item is incorporated by reference from our definitive Proxy Statement referred to in Item 10 above where it appears under the heading "Executive Compensation and Other Matters."

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by this Item regarding security ownership of certain beneficial owners and management is incorporated by reference from our definitive Proxy Statement referred to in Item 10 above where it appears under the heading "Security Ownership of Certain Beneficial Owners and Management."

The following table summarizes the securities authorized for issuance under our equity compensation plans as of December 31, 2021:

	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights	Weighted Average Exercise Price of Outstanding Options, Warrants and Rights	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans
Equity compensation plans approved by stockholders	2,801,782 ⁽¹⁾	\$ 10.99 ⁽²⁾	210,205 ⁽³⁾
Equity compensation plans not approved by stockholders	—	—	—
	<u>2,801,782</u>	<u>\$ 10.99</u>	<u>210,205</u>

- (1) Includes outstanding stock options and awards for 1,976,885 shares of our common stock under the 2008 Plan and 824,897 shares of our common stock under the 2018 Plan.
- (2) Includes the weighted average stock price for outstanding stock options of \$12.18 under the 2008 Plan and \$10.16 for the 2018 Plan.
- (3) Represents 152,188 shares of our common stock for the 2018 Plan and 58,017 for the Employee Stock Purchase Plan. No future awards shall occur under the 2008 Plan.

Item 13. *Certain Relationships and Related Transactions and Director Independence*

The information required by this Item is incorporated by reference from our definitive Proxy Statement referred to in Item 10 above where it appears under the heading "Certain Relationships and Related Transactions."

Item 14. *Principal Accountant Fees and Services*

The information required by this Item is incorporated by reference from our definitive Proxy Statement referred to in Item 10 above where it appears under the heading "Principal Accountant Fees and Services."

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) The following documents are filed as part of this Form 10-K:

- (1) *Consolidated Financial Statements (included in Part II of this report):*
Report of Independent Registered Public Accounting Firm
Consolidated Balance Sheets
Consolidated Statements of Operations
Consolidated Statements of Stockholders' Equity
Consolidated Statements of Cash Flows
Notes to Consolidated Financial Statements
- (2) *Consolidated Financial Statement Schedules:*
All consolidated financial statement schedules are omitted because the information is inapplicable or presented in the notes to the consolidated financial statements.
- (3) *Management Contracts, Compensatory Plans and Arrangements.*
Management contracts, compensatory plans and arrangements are indicated by the symbol “*” in the applicable exhibits listed in Item 15(b), below.

(b) *Exhibits*

The exhibits listed below are filed as part of this Form 10-K other than Exhibit 32.1, which shall be deemed furnished.

Exhibit No.	Description	Incorporated by Reference			
		Form	Filing Date	Exhibit No.	Filed Herewith
3.1	Amended and Restated Certificate of Incorporation.	10-Q	7/29/2005	3.1	
3.2	Certificate of Amendment of Restated Certificate of Incorporation.	8-K	5/8/2017	3.1	
3.3	Certificate of Amendment of Restated Certificate of Incorporation.	10-K	3/29/2019	3.3	
3.4	Amended and Restated Bylaws of Cassava Sciences, Inc.	8-K	12/11/2020	3.1	
4.1	Specimen Common Stock Certificate.	10-Q	8/12/2019	4.1	
4.2	Description of Registrant’s Securities.	10-K	3/26/2020	4.2	
10.2	[*] Employment Agreement, dated October 23, 2001, between Registrant and Nadav Friedmann, PhD. M.D.	10-K	3/22/2002	10.5	
10.5	[*] Employment Agreement, dated July 1, 1998 and amended December 17, 2008, between Registrant and Remi Barbier.	10-K	2/13/2009	10.12	
10.6	[*] 2000 Employee Stock Purchase Plan, as amended and restated.	10-Q	7/29/2010	10.1	
10.7	[*] 2008 Equity Incentive Plan.	8-K	5/29/2008	10.1	
10.8	[*] Amendment Number 1 to the 2008 Equity Incentive Plan.	10-Q	8/1/2013	10.1	
10.9	[*] Amendment No. 2 to Employment Agreement between Registrant and Remi Barbier.	10-Q	8/1/2013	10.2	
10.10	Lease Agreement, dated as of February 14, 2011 between Registrant and StoneCliff Office, L.P.	10-Q	4/27/2011	10.1	
10.11	[*] First Amendment to Lease Agreement, dated September 21, 2011.	10-K	2/9/2012	10.20	
10.12	Second Amendment to Lease Agreement, dated as of April 3, 2014 between Registrant and StoneCliff Office, L.P.	10-Q	8/6/2014	10.1	
10.13	Third Amendment to Lease Agreement, dated as of November 3, 2017 between Registrant US REIF Eurus Austin, LLC dba StoneCliff Building as successor in interest to StoneCliff Office, L.P.	10-K	2/6/2018	10.17	
10.14	Fourth Amendment to Lease Agreement, dated September 4, 2020 between Registrant US REIF Eurus Austin, LLC dba StoneCliff Building as successor in interest to StoneCliff Office, L.P.	8-K	9/10/2020	10.1	
10.15	[*] 2018 Omnibus Incentive Plan.	8-K	5/11/2018	10.1	
10.16	Sales Agreement, Dated March 27, 2020, between Registrant and SVB Leerink LLC.	S-3	3/27/2020	1.1	

10.17	³ Cassava Sciences, Inc. 2020 Cash Incentive Bonus Plan	8-K	9/1/2020	10.1	
10.18	³ Employment Agreement, executed on October 9, 2018, by and between Registrant and Eric Schoen.	8-K	10/11/2018	10.1	
10.19	³ Employment Agreement, executed on January 1, 2020, by and between Registrant and Dr. James Kupiec.	8-K	1/6/2021	10.1	
10.20	Form of Securities Purchase Agreement, dated February 10, 2021, by and between Cassava Sciences, Inc. and the purchasers named therein.	8-K	2/12/2021	10.1	
10.21	⁺ Master Services Agreement between Cassava Sciences, Inc. and Evonik Corporation, dated February 22, 2021.	8-K	3/11/2021	10.1	
10.22	⁺ Master Services Agreement between Cassava Sciences, Inc. and Premier Research International LLC, dated June 11, 2021	10-Q	8/4/2021	10.3	
10.23	⁺ Agreement of Sale and Purchase Between DWF IV Lakewood, LP and Cassava Sciences, Inc. dated July 2, 2021	10-Q	11/15/2021	10.4	
10.1	³ Form of Indemnification Agreement between Registrant and each of its directors and officers.				X
21.1	Subsidiaries of the Registrant.				X
23.1	Consent of Independent Registered Public Accounting Firm.				X
31.1	Certification of Principal Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				X
31.2	Certification of Principal Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				X
32.1	Certifications of the Chief Executive Officer and the Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				X
101.INS	XBRL Instance Document.				X
101.SC	XBRL Taxonomy Extension Schema Document.				X
H					X
101.CA	XBRL Taxonomy Extension Calculation Linkbase Document.				X
L					X
101.DE	XBRL Taxonomy Extension Definition Linkbase Document.				X
F					X
101.LA	XBRL Taxonomy Extension Labels Linkbase Document.				X
B					X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.				X
104	The cover page from the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2021, formatted in Inline XBRL (included in Exhibit 101).				X

* Management contract, compensatory plan or arrangement.

+Confidential portions of this document have been redacted as permitted by applicable regulations.

(c) *Consolidated Financial Statement Schedules*

All consolidated financial statement schedules are omitted because the information is inapplicable or presented in the notes to the consolidated financial statements.

Item 16. Form 10-K Summary

The Company has elected not to include summary information.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Cassava Sciences, Inc.
(Registrant)

/s/ REMI BARBIER
Remi Barbier,
Chairman of the Board of Directors,
President and Chief Executive Officer

Dated: February 28, 2022

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ REMI BARBIER</u> Remi Barbier	President, Chief Executive Officer and Chairman of the Board of Directors (Principal Executive Officer)	February 28, 2022
<u>/s/ ERIC J. SCHOEN</u> Eric J. Schoen	Chief Financial Officer (Principal Financial Officer)	February 28, 2022
<u>/s/ NADAV FRIEDMANN, PH.D., M.D.</u> Nadav Friedmann, Ph.D., M.D.	Chief Medical Officer and Director	February 28, 2022
<u>/s/ RICHARD J. BARRY</u> Richard J. Barry	Director	February 28, 2022
<u>/s/ ROBERT Z. GUSSIN, PH.D.</u> Robert Z. Gussin, Ph.D.	Director	February 28, 2022
<u>/s/ MICHAEL J. O'DONNELL, ESQ.</u> Michael J. O'Donnell, Esq.	Director	February 28, 2022
<u>/s/ SANFORD R. ROBERTSON</u> Sanford R. Robertson	Director	February 28, 2022
<u>/s/ PATRICK SCANNON, M.D., PH.D.</u> Patrick Scannon, M.D., Ph.D.	Director	February 28, 2022