UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 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, 2022

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission file number 001-40237

GAIN THERAPEUTICS, INC.

(Exact name of registrant as specified in its charter)

Delaware	**85-1726310**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
4800 Montgomery Lane, Suite 220 Bethesda, Maryland	**20814**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: **(301) 500-1556**

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

Title of Each Class	Trading Symbol	Name of Each Exchange on Which Registered
Common Stock, par value $0.0001 per share	GANX	Nasdaq Global 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, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act:

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

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

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to § 240.10D-1(b). ☐

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 common equity held by non-affiliates of the Registrant on June 30, 2022 (the last business day of the Registrant's second fiscal quarter), based upon the closing price of $3.60 of the Registrant's common stock as reported on The Nasdaq Global Market, was approximately $38.8 million.

As of February 28, 2023, 11,883,368 shares of the registrant's Common Stock were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive Proxy Statement ("Proxy Statement") of Gain Therapeutics, Inc. to be filed pursuant to Regulation 14A of the general rules and regulations under the Securities Exchange Act of 1934, as amended, for the 2023 annual meeting of stockholders to be held within 120 days after the end of the Registrant's 2022 fiscal year are incorporated by reference into Part III of this Form 10-K.

GAIN THERAPEUTICS, INC.
ANNUAL REPORT FORM 10-K

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Unless the context suggests otherwise, references in this Annual Report on Form 10-K, or the Annual Report, to "Gain," the "Company," "we," "us," and "our" refer to Gain Therapeutics, Inc. and, where appropriate, its wholly owned subsidiaries.

SEE-Tx® is our registered trademark. All other brand names and service marks, trademarks and other trade names appearing in this Annual Report are the property of their respective owners.

CAUTIONARY NOTE REGARDING FORWARD LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements which are made pursuant to the safe harbor provisions of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). These forward-looking statements can be identified by the fact that they do not relate strictly to historical or current facts and are often characterized by the use of words such as "aim", "believe," "can," "could," "potential," "plan," "predict," "goals," "seek," "should," "may," "may have," "would," "estimate," "continue," "anticipate," "intend," "expect" or the negative of these terms, other comparable terminology or by discussions of strategy, plans or intentions. These include, but are not limited to, statements about:

- the initiation, timing, progress and results of our current and future preclinical studies and clinical trials and our research and development programs;
- the ongoing impacts of the COVID-19 pandemic (or other pandemics or endemics) and its effects on our operations, access to capital, research and development and clinical trials and potential disruption in the operations and business of third-party manufacturers, contract research organizations other service providers, and collaborators with whom we conduct business;
- the success of our efforts to expand our pipeline of product candidates and develop marketable products through the use of our in-licensed Site-Directed Enzyme Enhancement Therapy, or SEE-Tx® platform;
- our ability to develop, obtain regulatory approval for and commercialize our current and future product candidates;
- our expectations regarding collaborations and other agreements with third parties and their potential benefits;
- the timing of investigational new drug, or IND, submissions, initiation of preclinical studies and clinical trials, and timing of expected clinical results for our product candidates;
- our success in early preclinical studies, which may not be indicative of results obtained in later studies or clinical trials;
- the potential benefits of our product candidates;
- our ability to identify patients with the diseases treated by our product candidates, and to enroll healthy volunteers and patients in clinical trials;
- our ability to obtain, maintain and protect our intellectual property;
- our reliance upon intellectual property licensed from third parties, including the license to use the SEE-Tx® platform;
- our ability to identify, recruit and retain key personnel;
- our estimates regarding expenses, future revenue, capital requirements and needs for additional financing;
- our financial performance;
- developments or projections relating to our competitors or our industry;
- the impact of laws and regulations;
- our expectations regarding government and third-party payor coverage and reimbursement;

- our expectations regarding the time during which we will be an emerging growth company under the JOBS Act;

- the impact of global events, including political instability, natural disaster, events of terrorism and wars, including the war between Ukraine and Russia, and the corresponding tensions created from such conflict between Russia, the United States and countries in Europe as well as other countries such as China;

- the impact of worsening macroeconomic conditions, including rising global inflation, actions taken by central banks to counter inflation, bank failures, capital market instability, exchange rate fluctuations, supply chain disruptions and increases in commodity, energy and fuel prices; and

- other factors and assumptions described in this Annual Report.

You should read this Annual Report with the understanding that such forward-looking statements involve known and unknown risks, expectations, uncertainties, assumptions, estimates and projections about our company and other important factors that could cause our actual results, performance or achievements, actual industry results, or other actual results or events to differ materially from historical results, from any plans, intentions, or expectations disclosed in such forward-looking statements or from any future results, performance, achievements or other events expressed, suggested or implied by such forward-looking statements. Therefore, you should not rely on any forward-looking information or statements as predictors of future results or events. Factors that could cause or contribute to such differences in results and events include, without limitation, those specifically addressed under the headings "Risk Factors" and "Management's Discussion and Analysis of Financial Conditions and Results of Operations" in this Annual Report and in our subsequent filings with the Securities and Exchange Commission. The effect of these factors is difficult to predict. In addition, factors other than these could also adversely affect our results, and the reader should not consider these factors to be a complete set of all potential risks or uncertainties. New factors emerge from time to time, and management cannot assess the impact of any such factor on our business or the extent to which any factor, or combination of factors, may cause results or events to differ materially from those contained in any forward-looking statement.

Any forward-looking statements included herein speak only as of the date of this Annual Report, and we undertake no obligation to update any forward-looking information or statements for any reason after the date of this Annual Report to conform these statements to actual results or changes in expectations, except as required by law. All forward-looking statements attributable to us are expressly qualified by the foregoing cautionary statements.

PART I

ITEM 1. BUSINESS

Overview

We are a biotechnology company developing novel small molecule therapeutics to treat diseases across several therapeutic areas, including, central nervous system ("CNS") disorders, lysosomal storage disorders ("LSDs"), metabolic disorders, and other diseases that can be targeted through protein degradation, such as oncology. We use our exclusively in-licensed computational target and drug discovery platform, Site-Directed Enzyme Enhancement Therapy ("SEE-Tx®"), to discover novel allosteric binding sites on proteins implicated in a disease and to identify proprietary small molecules that bind these sites to modulate protein function and treat the underlying cause of the disease. We believe that SEE-Tx® is uniquely suited to identify allosteric binding sites on the protein surface, which are different from the protein's active (or orthosteric) binding site where the natural ligand of the protein binds. Targeting an allosteric binding site instead of the active binding site of a protein provides numerous advantages, including: the ability to regulate proteins implicated in disease through several different mechanisms of action covering both functional and conformational effects, including stabilization, destabilization, targeted degradation, allosteric inhibition, and allosteric activation of the targeted protein; improved specificity of small molecules because binding to an allosteric binding site is non-competitive with the natural substrate that binds to the active binding site; and the ability to identify small molecules with more favorable drug-like properties. The SEE-Tx® platform has been used to identify novel allosteric sites and small molecules for all of our internal programs and partnered programs. Discovering and targeting novel allosteric sites with our platform not only reduces traditional drug discovery timelines but enables rational drug design and offers the potential for superior small molecule drugs that are highly specific and that can penetrate hard to reach tissues and cross the blood-brain barrier.

Our Lead Product Candidate: GT-02287 for the Treatment of GBA1 Parkinson's disease

Our lead product candidate, GT-02287, is being developed for the treatment of GBA1 Parkinson's disease, including restoration of GCase function, reduction of toxic lipid substrates and toxic forms of alpha-synuclein, improved survival of dopaminergic neurons, and increase of dopamine levels and improved locomotor function in animal models. We have generated an extensive preclinical data package providing evidence of the mechanism of action of GT-02287, and we anticipate completing IND-enabling toxicology studies by the first half of 2023. We plan to commence a first- in-human, Phase 1 dose escalation clinical trial in Australia of GT-02287 by the second half of 2023. The primary objectives of the Phase 1 clinical trial in Australia will be to evaluate administration of both single and multiple ascending dose levels of GT-02287 in healthy volunteers to assess safety and pharmacokinetics.

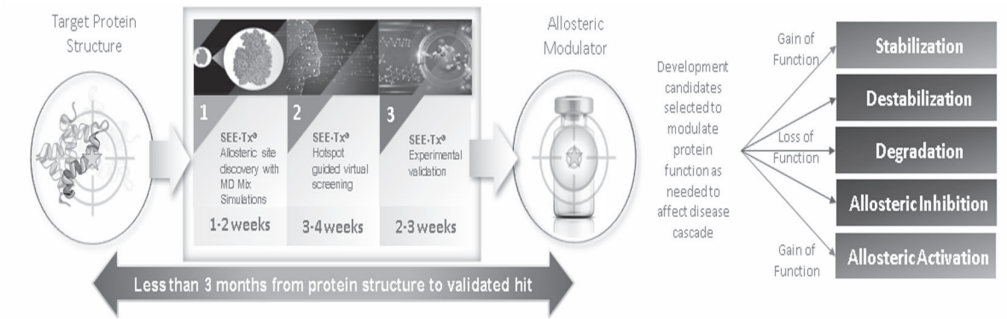
Our Research Programs Using SEE-Tx® Platform

In addition, we plan to continue to advance research programs and initiate additional programs targeting allosteric binding sites identified with the SEE-Tx® platform in various therapeutic areas, mainly oncology. Through academic partnerships, co-development and licensing arrangements, we intend to develop a broad pipeline of therapeutics, using our novel approach of identifying and targeting previously unknown allosteric sites.

Our Platform for Computational Target and Drug Discovery

Overview

A majority of disease-causing proteins (up to 90%) cannot be targeted due to the lack of a known binding site. Our exclusively in-licensed SEE-Tx® platform was designed to address this problem. We use the platform to discover novel binding sites on proteins implicated in a disease and to identify proprietary small molecules that bind these sites to modulate protein function and treat the underlying cause of the disease. We focus specifically on allosteric binding sites distinct from the protein's active, or orthosteric, binding site, where a small molecule can attach and trigger an effect that may lead to a therapeutic benefit. We refer to the small molecules we identify that bind to these allosteric sites as structurally targeted allosteric regulators, or STARs, to reflect their mechanism of action and how they are discovered. The graphic below provided an overview of SEE-Tx®.

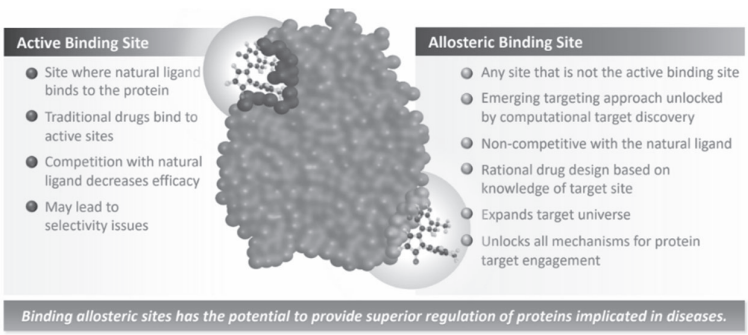


Allosteric Binding Site Identification

Using the three-dimensional structure of proteins that have been experimentally derived or generated or predictive protein structures from AI-powered databases such as Alphafold, our SEE-Tx® platform applies various computational methods and proprietary algorithms to identify and map previously uncharacterized clusters of binding hotspots on the protein surface where a small molecule can potentially bind. The number, density, nature and quality of these hotspot clusters determine the druggability of the protein, which refers to whether drug-like small molecules can effectively bind to the particular site on the target protein with an appropriate potency.

Advantages of Targeting Allosteric Binding Sites

We focus on allosteric binding site, which offer a number of advantages compared to targeting the active binding site of a protein, including the ability to regulate proteins implicated in disease through several different mechanisms of action covering both functional and conformational effects, improved specificity of small molecules because binding to an allosteric binding site is non-competitive with the natural ligand that binds to the active binding site, and the ability to identify small molecules with more favorable drug-like properties. The graphic below provided an overview of the differences and benefits of allosteric binding sites compared to active binding sites.



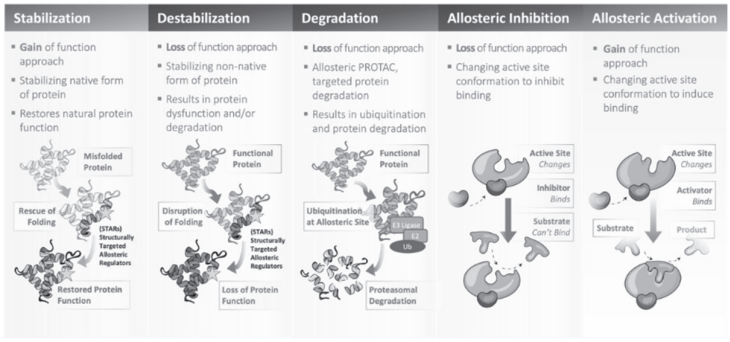
Identification of Structurally Targeted Allosteric Regulators ("STARs") – Our Molecular Hypothesis

After an allosteric site has been identified, characterized and selected for targeting, we then use our proprietary structure-based virtual screening methodology to filter a pool of seven to ten million commercially-available compounds to identify those that may potentially bind to the hotspot and have a functional effect. Using this information, we develop structural templates to guide the development of a narrowed pool of unique and proprietary small molecules that bind to the newly discovered allosteric sites.

We believe our process for identifying STARs provides several advantages over traditional drug discovery approaches such as random high-throughput screening. In high-throughput screening, very large libraries of randomly selected molecules are tested for their ability to perform a specific function such as binding to a target protein. This approach typically results in a large number of positive hits that must then be laboriously analyzed to identify compounds with relevant properties and effect. A high-throughput screening campaign may take up to two years or more to complete, and, on average, only 0.1% of all compounds tested in this manner bind to the targeted protein with the desired effect. In contrast, our approach is significantly less expensive, significantly faster and significantly more effective. We run our SEE-Tx® simulations for target and drug discovery in supercomputer centers where we pay only for time used as and when needed. We can identify a novel allosteric site in one to two weeks, perform virtual screening in three to four weeks, and validate compounds experimentally in two to three weeks. Our average hit rate for validated compounds is 14%, a greater than 100-fold higher success rate compared to traditional high throughput screening methods. Further, every small molecule hit identified by our platform is experimentally tested based on a two-part molecular hypothesis to confirm that (1) the compound has a positive effect on the relevant biomarkers implicated in the disease and (2) binding to the allosteric binding site identified with the SEE-Tx® platform has the intended effect on protein function.

Allosteric Regulators Cover Several Mechanisms of Action

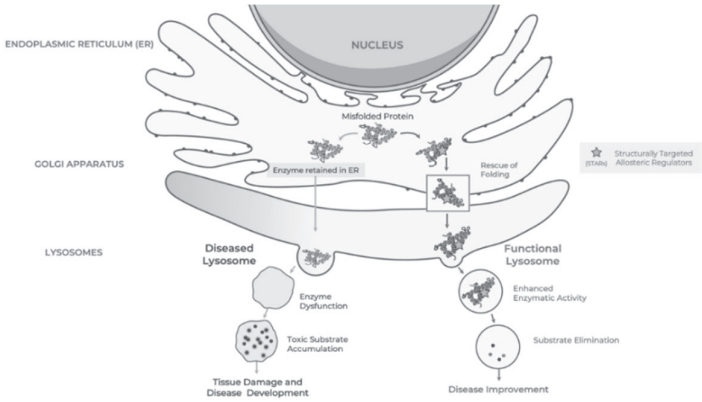
Another benefit of targeting allosteric sites is that it allows for several different mechanisms of action. In our LSD and Parkinson's disease programs, we have identified STARs that are designed to bind to a protein with a tendency to misfold, stabilize that protein in its correctly folded state and restore protein function. However, in areas such as oncology, we have identified STARs that are designed to destabilize target proteins by binding to a non-native or mutant form of the protein and render it inactive. There are several additional potential mechanisms of action including allosteric targeted protein degradation, as well as traditional allosteric inhibition or activation by inducing a conformational change to inhibit or induce binding by the natural ligand of the active site of the protein. The graphic below provides an overview of the different mechanism of action available through allosteric binding sites.



Enzyme Misfolding and Disease

Proteins are large biomolecules that have a vast array of functions in different cell types in the body. Enzymes are a type of protein that accelerate and facilitate chemical reactions inside of cells by acting on substrates and converting those substrates into different chemical products. To perform their function in the body, enzymes and other proteins must be folded into the correct three-dimensional shape. Misfolded enzymes may not function properly, which can lead to the toxic accumulation of unprocessed substrate which is the cause of many rare genetic diseases, including LSDs and some neurodegenerative diseases such as certain forms of Parkinson's disease. Enzyme misfolding may arise from genetic mutations that disrupt the folding pattern as well as from cellular stress due to aging and inflammation. Therapeutic small molecules that facilitate the folding of enzymes into their correct shape can restore function and the proper processing of substrate. As illustrated below, in LSDs, the gene that codes for an enzyme is

mutated and results in a misfolded enzyme. The misfolded enzyme cannot traffic through the cell resulting in toxic substrate accumulation in the lysosome. We believe that our STARs will have the ability to bind to the allosteric site of the defective enzyme and restore wild type activity and thus serve as potential therapeutic treatments for diseases. The graphic below provided an overview of the postulated mechanism of action.



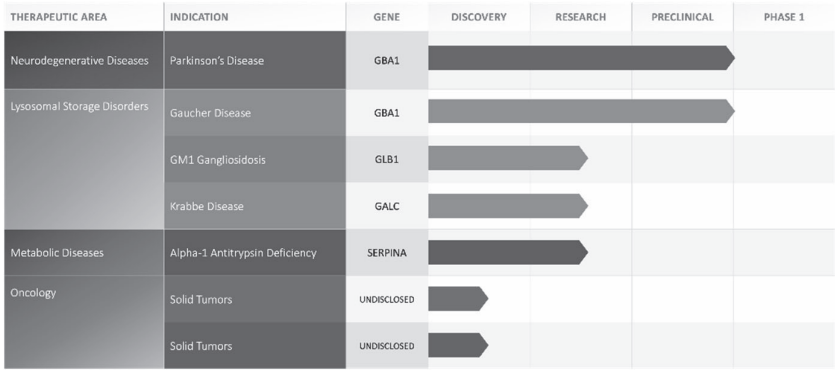
Limitations of Current Therapies for the Treatment of LSDs

Current therapeutic approaches to address misfolded enzymes have inherent limitations. In standard chaperone therapy, the drug binds to the active site of the enzyme or other target protein which impairs the protein's function to some degree by competing with the active substrate, decreasing efficacy and potentially leading to selectivity issues. Other treatments such as enzyme replacement therapy, or ERT, in which new functional enzymes are infused into the patient, are not suitable for treating neurological conditions because currently available ERTs cannot cross the blood-brain barrier. Gene therapy, which aims to replace mutated genes with non-mutated genes that then can express-functional enzymes, is not readily accepted for treating neurological conditions because the procedure is invasive in nature and the efficacy of treating neurological conditions remains to be established. In addition, clinical development, manufacturing and commercialization of gene therapies remains challenging in light of safety risks, complex manufacturing processes and high production costs, and difficulties in establishing prices acceptable to payors and health care systems. Given these limitations on current therapies and novel therapeutics approaches, we believe patients would benefit from mall molecules acting as structurally targeted allosteric regulators that offer a new therapeutic approach both on their own and, potentially, in combination with existing therapies. We believe our therapeutic approach represents a potentially significant change from current approaches by addressing protein misfolding using our efficient and proprietary ability to identify previously undiscovered allosteric sites and compounds that avoid the active sites of enzymes and cross the blood-brain barrier or penetrate other hard-to-treat tissues such as bone and cartilage.

Our Pipeline of STARs

We are leveraging our SEE-Tx® technology platform to develop a pipeline of novel small molecule drug candidates to address complex diseases. The platform is disease agnostic and provides us with the ability to expand our pipeline, quickly, efficiently and at low cost. We are currently focusing on progressing our programs in Parkinson's and Gaucher disease. We are also continuing to develop our program in Krabbe disease and liver and lung disease, and applying our SEE-Tx® platform to establish new programs in oncology. We are seeking non-dilutive funding in order to progress our other research programs in additional lysosomal storage disorders and metabolic diseases.

Our Product Pipeline



GCase Enzyme-Related Disorders: GBA1 Parkinson's Disease and Neuronopathic Gaucher Disease

We are investigating the restoration of GCase enzymatic function as a treatment for Parkinson's Disease, or PD, and neuronopathic Gaucher disease, or nGD, an LSD. GCase is an enzyme encoded by the GBA1 gene and found in lysosomes that is needed to breakdown the large molecule glucocerebroside (a component of the cell membrane) into sugar and fat.

Homozygous mutations of the GBA1 gene lead to the misfolding of GCase and associated GCase dysfunction and degradation, which in turn can lead to accumulation of GCase substrates to toxic levels in the liver, spleen, bone marrow and brain and can result in lysosomal storage and neurodegenerative diseases. Unlike other types of Gaucher disease, none of the existing therapeutics are effective in treating nGD.

GBA1 gene mutations are also found in the most pathogenic form of Parkinson's disease, or PD, where heterozygous mutations of the GBA1 gene also lead to the misfolding of GCase and reduced GCase activity, which similarly leads to accumulation of toxic levels of lipid substrate as well as alpha-synuclein, a pathological hallmark of Parkinson's disease. Decreased GCase activity is also observed in idiopathic PD (PD that occurs in patients without GBA1 mutations) and Dementia with Lewy Bodies. Currently, there is no cure for nGD or PD, and there are no treatment options that can halt or delay neuronal cell death, the underlying cause of the disease. Current treatments such as ERT cannot address central nervous system symptoms because they cannot cross the blood-brain barrier.

Overview of GBA1 Parkinson's Disease

Parkinson's disease is a disorder of the central nervous system that affects movement, often including tremors. Damage to dopaminergic neurons in the brain causes dopamine levels to drop, leading to the symptoms of Parkinson's disease. Parkinson's disease often starts with a tremor in one hand and other symptoms including slow movement, stiffness and loss of balance, and progresses to a severely debilitating disease that eventually requires full-time home care or a transfer to a skilled nursing facility.

GBA1 Parkinson's disease is caused by mutations in the GBA1 gene, which are the major genetic risk factor for the development of Parkinson's disease and related neurodegenerative disorders characterized by the accumulation of alpha-synuclein in cell bodies of neurons. It is widely accepted that GCase deficiency has a biological role as a modifier or facilitator of Parkinson's disease pathogenesis in the brain. Brain autopsy studies have shown that decreased levels of GCase are also found in patients with idiopathic Parkinson's disease (without *GBA1* mutations). Reduced GCase

activity may enhance the risk for Parkinson's disease by facilitating a pathological hallmark, namely alpha-synuclein accumulation. Alpha-synuclein accumulation and GCase deficiency are thought to act in a debilitating cycle. GCase deficiency can cause the accumulation of glucosylsphingosine substrate, which has been reported to directly affect the accumulation and aggregation of alpha-synuclein. In addition, increased alpha-synuclein levels can lead to less GCase activity, which in turn can lead to more alpha-synuclein accumulation.

Parkinson's disease is reported to affect about 1 in 780 people worldwide or approximately one million worldwide. Up to 15% of patients with Parkinson's disease carry GBA1 mutations, making it the major genetic risk factor for the disease and this rate is higher in certain patient populations. At present, there is no effective cure for Parkinson's disease. Current approved therapies for Parkinson's disease are limited to symptomatic treatments such as levodopa, dopaminergic receptor agonists and inhibitors of enzymes related to dopamine metabolism such as monoamine oxidase inhibitors and catechol-O-methyltransferase inhibitors. These therapies aim to improve overall dopaminergic function. The benefits of these types of treatments diminish over time as the disease progresses, and these therapies do not impact the non-motor symptoms such as cognitive decline or the progression of the disease. As the disease progresses, the non-motor symptoms, such as dementia and cognitive impairment, can lead to severe morbidity and mortality.

Overview of Gaucher Disease

Gaucher disease is an inherited LSD caused by homozygous mutations of the GBA1 gene that result in the misfolding and subsequent dysfunction of GCase, an enzyme that breaks down fatty chemicals in the body. Gaucher disease is traditionally classified according to one of three types. Type 1 Gaucher disease is traditionally referred to as a non-neuronopathic form of the disease, for which some treatments are available, but evolving science has shown that patients with type 1 Gaucher disease may also manifest neurological symptoms later in life. Current ERT and gene therapy treatments are unable to address the onset of type 1 neurological symptoms because these treatments are unable to cross the blood-brain barrier. Unlike Gaucher disease type 1, Gaucher disease types 2 and 3 have early onset brain degeneration that worsens over time. For this reason, Gaucher disease types 2 and 3 are known as neuronopathic Gaucher disease (nGD). Currently, there is no effective treatment for nGD. In type 2 Gaucher disease, there is neurological impairment that presents before birth through the first months of life, progresses rapidly, and is typically fatal within two years. It is a devastating disorder characterized by neurodegeneration and brainstem dysfunction. Additionally, infants with Gaucher disease may have abnormally large organs, deficiency in growth, seizures and compromised swallow and airway problems. Gaucher disease type 3 (also known as chronic neuronopathic Gaucher disease) has a later and more gradual onset compared with type 2. People with Gaucher disease type 3 may survive into adulthood with a wide variety of signs and symptoms, including seizures, skeletal irregularities, eye movement disorders, cognitive and coordination problems as well as enlarged liver and spleen, respiratory problems and blood disorders.

Gaucher disease is caused by mutations of the GBA1 gene that encodes GCase, an enzyme which catalyzes a key step in breaking down glucosylceramide and glucosylsphingosine. Partial or complete loss of GCase activity can cause the buildup of glucosylceramide and glucosylsphingosine in the lysosomes of macrophages, and the accumulation of these lipid substrates in neuronal cells can result in neurological symptoms.

The prevalence of Gaucher disease type 1 (non-neuronopathic Gaucher disease) is reported as 1:57,000 to 75,000 people worldwide. Type 1 is the most common form in Western countries (around 95%). The prevalence of type 2 and type 3 Gaucher disease, or nGD, is approximately 1:100,000 people worldwide, and these forms are the most common in non-Western countries, especially in Asian countries where they make up more than 50% of the Gaucher disease patient population. At present there are no available treatment options for neuronopathic Gaucher disease, but ERT is still used to address organ enlargement, hematological manifestation and bone disease, as well as to improve the quality of life for these patients. ERT does not cross the blood-brain barrier and is not efficient in treating neurological manifestations, therefore creating a significant unmet medical need in this patient population.

Preclinical Characterization of Lead Compound GT-02287 for the Treatment of GBA1-related Diseases

We have continued to assess the performance of our lead compounds GT-02287 and GT-02329 in the various cell-based and animal models of PD and GD that we have performed with these compounds. As more data have been generated, we determined that both molecules have similar properties and are similarly suitable for the development in GBA1 PD and nGD. In light of the totality of the data generated with these compounds to date, we have determined to select GT-02287 as the drug candidate for all GBA1-related disease and to maintain GT-02329 as a potential back-

up compound to GT-02287. This decision resulted in a reduction of projected development costs of our GBA1 program of approximately $8.4 million.

Activity in Biophysical and Cell-based Assays

Biophysical assay results have demonstrated that GT-02287 binds to the GCase protein and increases its thermal stability. In cell-based functional assays, we observed a dose-dependent increase in GCase activity in normal and GCase mutant cells when treated with GT-02287 as well as a concomitant depletion of the GCase substrate, glucosyl ceremide. Our STAR compound also has shown GCase enzyme enhancement in an extended panel of patient derived cells representative of the most frequent and pathogenic GBA1 mutations related to GBA1 PD and nGD. In addition, we reported that GT-02287 increased GCase enzyme levels, co-localization of GCase with lysosomes, reduced GlcCer accumulation as well as phosphorylated and aggregated a-synuclein accumulation in cells derived from L444P/RecNcil and L444P/L444P patients.

Toxicology and Safety

GLP toxicology studies have shown that GT-02287 is well tolerated following single oral administration of 2000 mg/kg and 1000 mg/kg for male and female rats, respectively, and 1000 mg/kg in male and female dogs.

The GLP toxicology study with repeated administrations of GT-02287 in male and female dogs and rats is currently ongoing. No severe toxicity has been encountered up to 1000 mg/kg in dog after 14 day administration, corresponding to a human equivalent dose of 33 g per day (based on 60 kg as a standard human subject body weight). We anticipate completing IND-enabling toxicology studies in the first half of 2023 with the goal of filing the dossier required to commence a first-in-human, Phase 1 clinical trial of GT-02287 in the second half of 2023.

Pharmacokinetics

Studies in mice, rats and dogs have shown that GT-02287 is quickly absorbed following oral administration, reaching the maximal concentration in plasma (Tmax) between 0.5 and 2 hours with a plasmatic half-life (t1/2) of about 2 hours in mice, 3 hours in rats and 5 hours in dogs.

We examined GT-02287 in neuro-PK studies to evaluate its brain penetration properties, and we observed high brain exposure with a brain-to-plasma ratio level greater than one.

In-Vivo Pharmacology in PD Animal Models

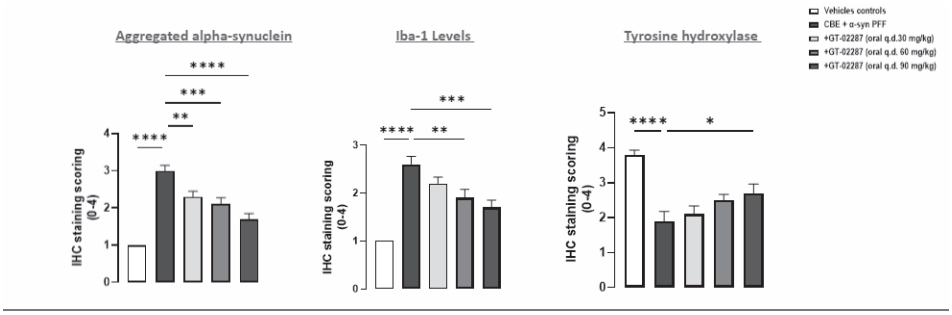
In mice administered the GCase inhibitor CBE (conduritol beta epoxide) plus intra-striatal injected alpha-synuclein pre-formed fibrils, or PFF, to simulate the effects of GBA1 Parkinson's disease. GT-02287 was orally administered once a day, at doses of 30, 60 and 90 mg/kg. The data generated in this study showed a statistically significant augmentation of GCase activity, reduction of the accumulation of the toxic substrates glucosylsphingosine and glucosylceramide, a reduction of aggregated alpha synuclein, and a reduction of microgliosis, which is an indicator of reduced neuroinflammation. In the same animal model, GT-02287 improved the survival of dopaminergic neurons in the substantia nigra. Notably, these biological effects resulted in a dose-dependent behavioral effect shown by improved neuromotor strength as measured by the "wire-hang" test.

In a rotenone-induced Parkinson's disease rat model, GT-02287 was administered orally, twice a day for seven days at a dose of 30, 60 and 90 mg/kg bodyweight. In this study, we observed that GT-02287 showed a reduction of total, aggregated and phosphorylated alpha-synuclein as well as a reduction in microgliosis. In addition GT-02287 improved the survival of dopaminergic neurons along with an increased level of dopamine in the striatum. Notably, these biological effects resulted in a dose-dependent behavioral effect shown by an improvement of the motor functionality measured by assessing the rearing behavior.

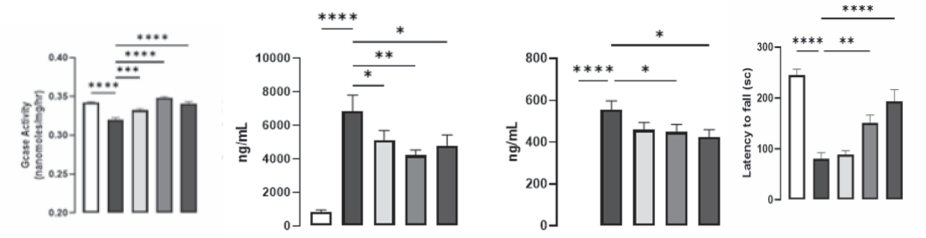
To verify the potential difference of a twice-a-day and once-a-day dose regimen, the rotenone rat model was repeated administering GT-02287 orally once per day for 10 days at the dose range 60 and 90 mg/kg. The study provided a similar read-out for aggregated alpha-synuclein and survival of dopaminergic neurons in the substantia nigra thus suggesting that once-a-day oral administration can provide a similar efficacy to twice-a-day administration. In addition, GT-02287 was shown to reduce tumor necrosis factor alpha (TNF-alpha), a biomarker for

neuroinflammation, in the substantia nigra as well as augment GCase activity in the brain as shown by an increase of GCase activity in cerebrospinal fluid (CSF).

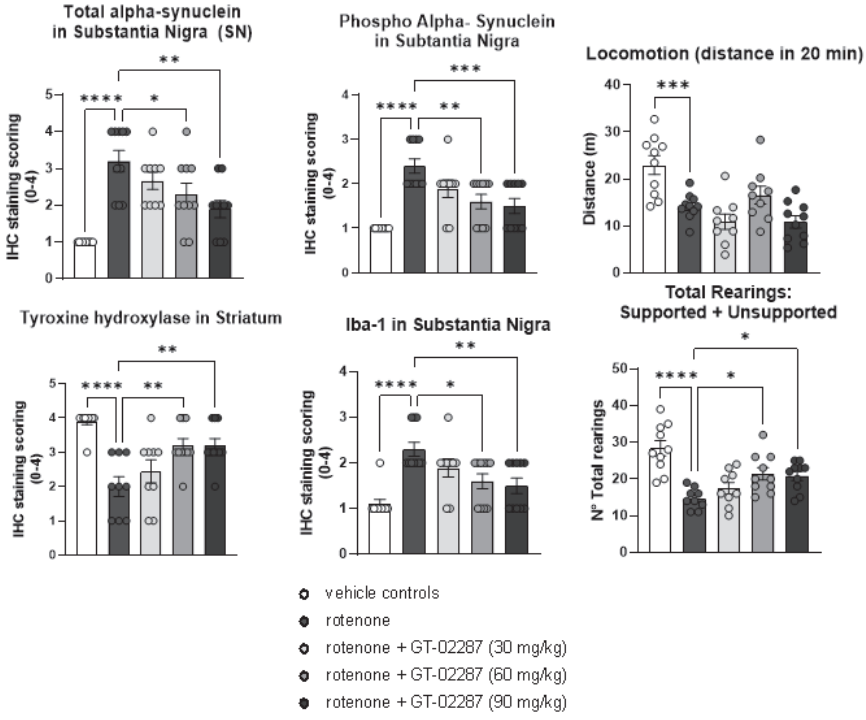
Results of the CBE/PFF Mouse Model



GCase Activity (plasma) Glucosylceremide (brain) Glucosylspingosine (brain) Motor (wire hang)



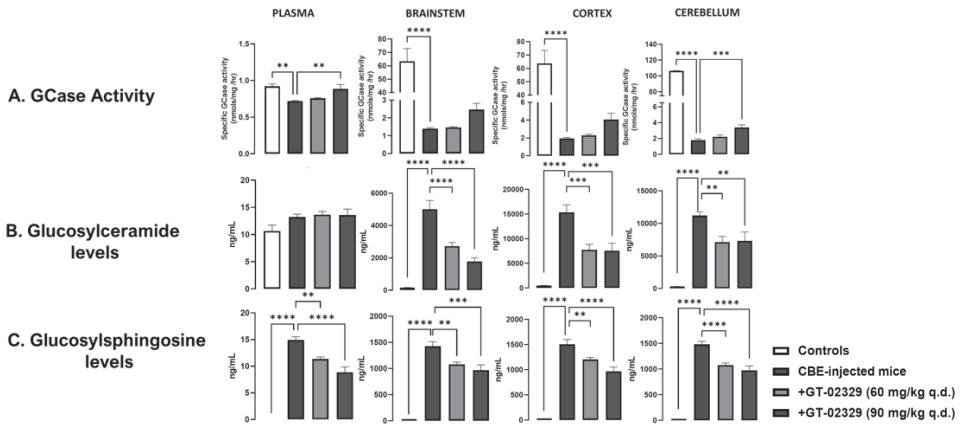
Results of the Rotenone Rat Model



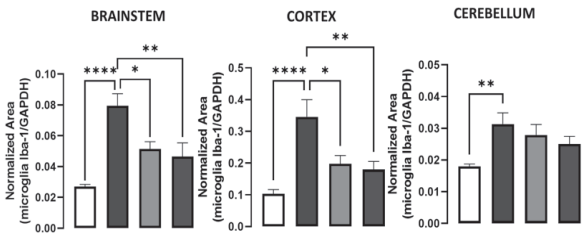
In Vivo Pharmacology in GD Animal Models

In mice administered the GCase inhibitor CBE to model Gaucher's disease, our product candidate GT-02329 was orally administered once a day at a doses of 60 and 90 mg/kg. The data generated in this study showed a statistically significant augmentation of GCase activity in plasma and various different brain regions, reduction of the accumulation of the toxic substrates glucosylsphingosine and glucosylceramide and a reduction of Iba-1 levels, a marker of microgliosis, which is an indicator of reduced neuroinflammation. In the same animal model, treatment with GT-02329 caused dose-dependent behavioral effect shown by improved motor strength as measured by the "wire-hang" test.

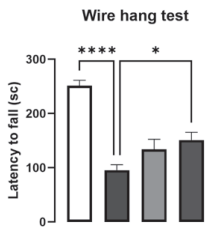
Results of the CBE Mouse Model



Iba-1 levels in brains of CBE-injected mice treated with GT-02329



Motor Function



Pipeline Programs in Research and Discovery Phases

In addition to our preclinical stage programs for PD and nGD, we are progressing additional programs in the research and discovery phases, including our Krabbe disease program, our liver and lung disease program, and two active programs in oncology. We are also seeking non-dilutive funding in order to continue additional research programs in additional lysosomal storage disorders and metabolic diseases.

GALC Enzyme-Related Disorders: Krabbe Disease

We are investigating the restoration of GALC function as a treatment for Krabbe disease. GALC is an enzyme in lysosomes needed to breakdown galactolipids, which are fats primarily found in the nervous system and kidneys. Among the galactolipids that GALC breaks down are galactosylceramide, which is an essential component of neuronal myelin, and psychosine, which is formed during myelin production and is toxic to cells. The misfolding of GALC can

result in the toxic accumulation of galactosylceramide, inhibiting myelin production, and of psychosine, leading to demyelination of cells and ultimately to Krabbe disease. There is no available cure for Krabbe disease. Current developments in invasive procedures such as bone marrow transplants have not been shown to provide significant neurological improvements, and most developments in gene therapy treatments are still in the preclinical stages.

We have identified compounds that bind to allosteric sites on GALC and stabilize the enzyme *in vitro*. We are continuing our development of these promising molecules.

Overview of Krabbe Disease

Krabbe disease is a severe neurological condition that is part of a group of disorders which result from the loss of myelin (demyelination) in the CNS. Myelin is the protective covering around neurons that ensures the rapid transmission of neural signals. The most common form of Krabbe disease, the infantile form, usually begins before the age of one. Initial symptoms typically include irritability, muscle weakness, feeding difficulties, episodes of fever without any sign of infection, stiff posture and delayed mental and physical development. As the disease progresses, muscles continue to weaken, affecting the infant's ability to move, chew, swallow and breathe. Affected infants also experience vision loss and seizures. Because of the severity of the condition, individuals with the infantile form of Krabbe disease rarely survive beyond the age of two. The less common forms, those that have a later onset, begin in childhood, adolescence, or adulthood. Vision problems and walking difficulties are the most common initial symptoms in these late-onset forms of the disorder, however, signs and symptoms vary considerably among affected individuals. Individuals with late-onset Krabbe disease may survive many years after the condition begins.

Krabbe disease is an inherited LSD caused by mutations in the gene GALC. In affected individuals, GALC substrate psychosine accumulation can trigger a neuroinflammatory response, a loss of myelin forming cells and a progressive demyelination of the central and peripheral nervous systems.

The prevalence of Krabbe disease is reported as about 1 in 100,000 to 1 in 250,000 live births worldwide. At present, there is no effective cure or disease-modifying treatment for Krabbe Disease. Treatment of a child who is symptomatic before six months of age is supportive and focused on improving quality of life and avoiding complications. For older individuals, treatment with HSCT is individualized based on disease burden and manifestations, but it serves to delay disease progression and is not an effective cure.

Preclinical Characterization of GALC Lead Compounds

Biological Activity

We have identified several compounds that bind to allosteric sites on GALC and are able to stabilize GALC against thermal denaturation. STAR molecules were tested in vitro in transfected HEK293 cells bearing different mutations (WT, G286D, T529M). We examined promising STAR molecules in neuro-PK studies to evaluate their brain penetration properties. Several of the compounds selected showed enhanced enzyme enhancement and high brain exposure with a brain-to-plasma ratio level greater than one.

In collaboration with Ernesto R. Bongarzone, Ph.D., Professor in Neuroscience at the College of Medicine at the University of Illinois, Chicago, initial compounds from this program were tested in mouse glial cultures and cell lines with relevant GALC mutations to measure their effect on GALC enzymatic activity and psychosine levels. We showed that the tested compounds showed significant reduction in psychosine levels in glial cultures.

Further characterization of our compounds is ongoing and we expect to select a lead series for further development based on additional data generated in this program.

GLB Enzyme-Related Disorders: GM1 Gangliosidosis

GLB is an enzyme found in lysosomes, which are compartments within cells that degrade and recycle different types of molecules, including toxic molecules. GLB is essential for the breakdown of GM1 and keratan sulfate, which serve important functions in the brain and other tissues. Misfolding of GLB allows these substrates to build up to toxic levels and leads to the diseases GM1 Gangliosidosis.

GM1 gangliosidosis is a rare and often life-threatening LSD in infants (type 1), juveniles (type 2) and adults (type 3). It manifests in a continuum of clinical severity by type. In type 1 or the infantile form, the onset is observed earlier and is a more severe and rapidly progressive disease. Type 2 and 3 are less severe manifestations and have slower progression with a juvenile or adult onset. The infantile form of the disease is characterized by onset in the first year of life with symptoms including hypotonia (reduced muscle tone), progressive CNS dysfunction that can lead to deafness, blindness, enlarged liver and spleen rigidity, and progressive skeletal dysplasia that can result in restrictive lung disease and aspiration pneumonia. The disease rapidly progresses, with a life expectancy of two to four years. Juvenile GM1 manifests between 18 months and five years of age with a slower progression compared to infants. The average life expectancy for type 2 GM1 is typically 10 years. Adult GM1 has an onset age between three and 30. While it is less severe and progresses at a slower rate than infantile or juvenile GM1, adult GM1 causes debilitating symptoms, including muscular atrophy, corneal clouding and dystonia.

The prevalence of GM1 is approximately 1:100,000 to 200,000 live births worldwide. Currently, there is no effective cure for GM1, and symptomatic treatment options, including substrate reduction therapy, ERT, bone marrow transplantation, stem cell transplantation and gene therapy are limited or still under development. We believe current approaches are unable to address both the neuronal and systemic symptoms because current treatment options cannot cross the blood-brain barrier or reach other hard-to-treat organs, such as bone.

In Vitro Characterization of STARs for the Treatment of GM1 Gangliosidosis

We have identified novel STAR molecules targeting GLB through our SEE-Tx® platform and conducted our initial studies on these compounds. Binding of two of these compounds to the GLB target has been confirmed using a biophysical assay. Preclinical studies indicate that our STARs help mutated GLB escape premature degradation and travel to the lysosome where it can perform its catalytic activity. These preliminary studies were conducted *in vitro* using cells that carried the GLB1 mutation. In addition, one compound showed clearance of the toxic GM1 ganglioside accumulation in GM1-affected canine cells. Based on the data generated to date, we have selected a lead series for further characterization and development.

Serpina related disorder: alpha-1 Antitrypsin (A1AT) Deficiency

We are investigating the stabilization of alpha-1 antitrypsin (A1AT) as a potential treatment for rare lung and/or liver disorder. If A1AT is stabilized, then we believe the molecule would be rendered inactive, thereby preventing the gain of function of the molecule in the lung or liver. We have identified one allosteric site and have selected 146 virtual hits obtained from virtual screening with which we plan to start experimental hit confirmation.

Primary Screening

Hit identification completed with Surface Plasmon Resonance (SPR) at one concentration and in dose-response. Binding was confirmed for 23 of 146 compounds (15.6% hit rate). Hit analoging was completed with 85 analog compounds tested in a SPR dose-response assay. Positive signal was observed for 4 of 85 compounds.

We have now identified a hit chemical series that inhibits polymerization of A1AT protein, and a priority patent application was filed in February 2023.

On March 21, 2023 we announced that that Eurostars with Innosuisse have awarded a grant in the aggregate amount of €1.2 million to a consortium led by Gain Therapeutics which includes the Institute for Research in Biomedicine, Newcells Biotech and the University of Helsinki. This grant supports a research project to develop novel small molecule allosteric regulators against Alpha-1 Antitrypsin (AAT) Deficiency, a rare genetic condition that can result in serious lung and liver diseases.

Oncology

Allosteric Regulators in Oncology

Allosteric regulators are molecules able to modify the activity of a protein binding to a site topographically distinct from the site of the protein, called the active site, in which the activity characterizing the protein is carried out and in oncology usually involves the binding of receptors.

Targeting allosteric sites may provide greater specificity and selectivity of activity and allow for a better efficacy and safety profile. An allosteric site is more specific to an individual protein, potentially leading to safer and more efficacious medicines. The allosteric-targeted therapies also introduce the possibility of fine-tuning a protein's activity in new ways—one modulator may shift a protein into a conformation that shuts it down entirely, while another might under the right condition potentiate activity, and others may result in activity levels in between. Allosteric drugs open the door to identifying drug targets that are inaccessible to traditional active-site inhibitors. Allosteric drugs also may provide a new foundation for combining oncolytic agents, to achieve important additive and synergistic effects, and to prevent or overcome drug-resistance to traditional orthosteric anti-cancer agent.

Target Selection Strategy

Targets have been selected based on the potential mechanism of action (with an initial focus on allosteric inhibition), unmet medical needs such as immune resistance, metastatic resistance, non satisfactory response to current standard of care, level of innovation and availability of preclinical tools.

Our Oncology Programs

We have two active oncology projects underway in which we are identifying STARs that are designed to destabilize target proteins by binding to allosteric sites on the proteins and rendering them inactive. Thus far we have identified allosteric binding sites and run virtual screens to identify virtual hits which are being characterized further in biochemical and cell-based assays.

Competition

The biotechnology and pharmaceutical industries are characterized by the rapid evolution of technologies and understanding of disease etiology, intense competition, and a strong emphasis on intellectual property. We believe that our SEE-Tx® platform, our scientific capabilities, know-how and experience provide us with competitive advantages. However, we expect substantial competition from multiple sources, including major pharmaceutical, specialty pharmaceutical, and existing or emerging biotechnology companies, academic research institutions and governmental agencies and public and private research institutions worldwide. Many of our competitors, either alone or with their collaborations, have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals, and marketing approved products than we do. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient enrollment in clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs. As a result, our competitors may discover, develop, license, or commercialize products before or more successfully than we do. We are not aware of any other companies that are taking the same therapeutic approach to protein folding disorders similar to the ones we are pursuing. However, we are aware of companies developing products for the same target indications. For example, companies targeting GBA-PD using small molecules include Vanqua Bio and Caraway Therapeutics. While both of these approaches are small molecules hypothesized to increase GCase levels, they differ from our approach because our molecules act as non-competitive pharmacological chaperones, specifically focused on stabilizing and restoring function to misfolded GCase. There are also a number of companies targeting GBA-PD through other modalities such as cell/gene therapies and monoclonal antibodies. These companies include, among others: Prevail Therapeutics, which is evaluating a potential gene therapy candidate in a Phase 1/2 clinical trial, Apollo Therapeutics and Voyager Therapeutics.

There are also a number of companies with alpha-synuclein specific approaches ranging from all stages of clinical development but these are distinct from us as they only aim to deplete a specific substrate rather than affecting the root cause of the disease at the start of the disease cascade. For Krabbe disease, companies such as Chiesi, Ranedis, Passage Bio, MediciNova and Polaryx are all developing potential therapies, which we believe are in the preclinical stage. We may also face competition from large pharmaceutical and biotechnology companies, academic research institutions, government agencies and public and private research institutions with genetic medicine and other therapeutic approaches.

Additionally, new or advanced technologies developed by our competitors may render our current or future product candidates uneconomical or obsolete, and we may not be successful in marketing our product candidates against competitors.

Strategic Transactions; Collaboration and Licensing Arrangements

In connection with our business development activities, we enter into collaborative and licensing arrangement with third parties, to use our licensed SEE-Tx® computational platform technology to discover novel allosteric sites on misfolded proteins and identify proprietary small molecules that bind these sites, potentially restoring protein folding and treating disease. We expect to continue to identify and evaluate collaboration, co-development and licensing opportunities that may be similar to or different from the collaborations and licenses that we have entered into.

Zentalis Pharmaceuticals, Inc.

On April 20, 2021, we entered into a multi-target collaboration agreement, or the Zentalis Agreement, with Zentalis Pharmaceuticals, Inc., or Zentalis, to discover new product candidates for the treatment of cancer. Under the terms of the agreement, we used our licensed SEE-Tx computational platform technology to identify binding site on target proteins and determine the potential suitability of these sites as drug targets, as well as the prospective therapeutic use of our technology for treatment of oncology.

During the course of 2022, Zentalis informed us of its desire to wind down the collaboration. Based on the results generated during the collaboration, we determined to continue the research activities independently (without support of Zentalis) with respect to the applicable target as one of our own internal programs.

Minoryx Therapeutics, S.L.

We have entered into a license agreement, dated December 20, 2017 (the "Minoryx License Agreement"), with Minoryx Therapeutics, S.L., a company organized under the laws of Spain ("Minoryx"), pursuant to which we obtained exclusive worldwide license rights from Minoryx to use and exploit its intellectual property ("IP"), including its SEE-Tx® discovery platform for the identification of non-competitive pharmacological chaperones and exclusive worldwide sublicense rights to certain IP licensed by Minoryx from the University of Barcelona and the Institució Catalana de Recerca i Estudis Avançats. Under the terms of the Minoryx License Agreement, we have an exclusive, worldwide, royalty-bearing, assignable, transferable license, including the right to license through multiple tiers of sublicense, to Minoryx's IP to make, have made, use, import, export, offer to sell, have sold, copy, modify, perform, display, create derivative versions of products in the licensed field or otherwise to exploit Minoryx's IP in the field. Minoryx's IP includes the SEE-Tx® discovery platform, certain proprietary Minoryx compounds acting as pharmacological chaperones, all patents and pending applications related thereto and Minoryx's Know-How and Trademark related to the SEE-Tx® platform. We also have an exclusive, worldwide, royalty-bearing, assignable, transferable sublicense, including the right to sublicense through multiple tiers of sublicense, to the IP of Universitat de Barcelona (UB) and Institucio Catalana de Recerca i Estudis Avancats (ICREA) in EP11380102 and know-how and software related thereto, for the purpose of making, having made, using, importing, offering to sell, selling and having sold, copying, modifying, performing, displaying, and creating derivative versions of products in the field. Under the Minoryx License Agreement, products include any product in the field that would infringe the UB/ICREA IP or the Minoryx IP in the absence of the license provided therein. Also, the field encompasses any field of use and commercialization of the UB/ICREA IP or the Minoryx IP. Unless earlier terminated, the Minoryx License Agreement expires upon expiration of the royalty term, which occurs ten years after the first product covered by the licensed IP is commercialized. Khalid Islam, the Chairman of our board of directors and one of our founders, is currently the Chairman of the board of directors of Minoryx.

As consideration for the license grant from Minoryx, we have agreed to pay Minoryx royalties on a product-by-product basis based on the licensed IP used by us, ranging from a high single digit to low single digit percentage of net revenues of products during the royalty term commencing on the effective date of the Minoryx License Agreement and continuing until the 10th anniversary of the first product commercialization. Upon the expiration of the royalty term for a product or service in a country, the license with respect to the product or service, as the case may be, shall become royalty-free, fully-paid, irrevocable and perpetual.

The Minoryx License Agreement will terminate upon expiration of the royalty term (which is the 10th anniversary of the commercialization of the first product covered by the licensed IP) or by mutual agreement. In addition, each party has the right to terminate the Minoryx License Agreement upon a material breach by the other party that remains uncured. Minoryx has the right to terminate the Minoryx License Agreement on a country-by-country basis if we abandon the technology or use the technology for purposes in violation of law and we fail to cure

such abandonment or unlawful use. We may terminate the Minoryx License Agreement at any time upon 90 days' written notice.

Intellectual Property

We strive to protect and enhance the proprietary technologies, inventions and improvements that we believe are important to our business, including seeking, maintaining and defending patent rights, whether developed internally or licensed from third parties. Our policy is to seek to protect our proprietary position by, among other methods, pursuing and obtaining patent protection in the United States and in jurisdictions outside of the United States related to our proprietary technology, inventions, improvements, platforms and our product candidates that are important to the development and implementation of our business.

As of February 2023, our patent portfolio consisted of six pending European patent applications and related national stage applications. In regard to our SEE-Tx® Technology, we in-license a European patent under the Minoryx License Agreement, which is owned by UB/ICREA and has claims directed to a method of binding site and binding energy determination by mixed explicit solvent simulations. This patent is expected to expire in 2032.

In regard to our GLB program, we in-license from Minoryx pursuant to the Minoryx License Agreement, a patent family with a pending European patent application with claims directed to composition of matter and eight foreign patent applications pending in such jurisdictions such as Canada, Australia, Japan, Europe, and China. These patents applications, if issued, are expected to expire in 2037, not giving effect to any potential patent term extensions and patent term adjustments and assuming payment of all appropriate maintenance, renewal, annuity or other governmental fees.

In regard to our GBA program, we in-licensed from Minoryx pursuant to the Minoryx License Agreement, a patent family with a pending European patent application with claims directed to composition of matter and eight foreign patent applications pending in such jurisdictions such as Canada, Australia, Japan, Europe, and China. These patent applications, if issued, are expected to expire in 2037, not giving effect to any potential patent term extensions and patent term adjustments and assuming payment of all appropriate maintenance, renewal, annuity or other governmental fees.

Individual patents extend for varying periods depending on the date of filing of the patent application or the date of patent issuance and the legal term of patents in the countries in which they are obtained. Generally, patents issued for regularly filed applications in the United States are granted a term of 20 years from the earliest effective non-provisional filing date or the filing date of a PCT application that designates the United States. In addition, in certain instances, a patent term can be extended to recapture a portion of the U.S. Patent and Trademark Office, or USPTO, delay in issuing the patent as well as a portion of the term effectively lost as a result of the FDA regulatory review period. However, as to the FDA component, the restoration period cannot be longer than five years and the total patent term including the restoration period must not exceed 14 years following FDA approval. The duration of foreign patents varies in accordance with provisions of applicable local law, but typically is also 20 years from the earliest effective filing date, which is typically the filing date of the PCT application. However, the actual protection afforded by a patent varies on a product-by-product basis, from country to country and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country and the validity and enforceability of the patent.

Furthermore, we rely upon trade secrets and know-how and continuing technological innovation to develop and maintain our competitive position. We seek to protect our proprietary information, in part, using confidentiality agreements with our collaborators, employees and consultants and invention assignment agreements with our employees. We also have confidentiality agreements or invention assignment agreements with our collaborators and selected consultants. These agreements are designed to protect our proprietary information and, in the case of the invention assignment agreements, to grant us ownership of technologies that are developed through a relationship with a third party. These agreements may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our collaborators, employees and consultants use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Our success will also depend in part on not infringing upon the proprietary rights of third parties. It is uncertain whether the issuance of any third-party patent would require us to alter our development or commercial

strategies, or our drugs or processes, obtain licenses or cease certain activities. Our breach of any license agreements or failure to obtain a license to proprietary rights that we may require to develop or commercialize our future drugs may have an adverse impact on us. If third parties have prepared and filed patent applications prior to March 16, 2013 in the United States that also claim technology to which we have rights, we may have to participate in interference proceedings in the USPTO to determine priority of invention.

Government Regulation

The FDA and other regulatory authorities at federal, state and local levels, as well as in foreign countries, extensively regulate, among other things, the research, development, testing, manufacture, quality control, import, export, safety, effectiveness, labeling, packaging, storage, distribution, record keeping, approval, advertising, promotion, marketing, post-approval monitoring and post-approval reporting of drugs. We, along with our vendors, contract research organizations and contract manufacturers, will be required to navigate the various preclinical, clinical, manufacturing and commercial approval requirements of the governing regulatory agencies of the countries in which we wish to conduct studies or seek approval of our product candidates. The process of obtaining regulatory approvals of drugs and ensuring subsequent compliance with appropriate federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources.

In the U.S., the FDA regulates drug products under the Federal Food, Drug, and Cosmetic Act, or FD&C Act, as amended, its implementing regulations and other laws. If we fail to comply with applicable FDA or other requirements at any time with respect to product development, clinical testing, approval or any other legal requirements relating to product manufacture, processing, handling, storage, quality control, safety, marketing, advertising, promotion, packaging, labeling, export, import, distribution, or sale, we may become subject to administrative or judicial sanctions or other legal consequences. These sanctions or consequences could include, among other things, the FDA's refusal to approve pending applications, issuance of clinical holds for ongoing studies, withdrawal of approvals, warning or untitled letters, product withdrawals or recalls, product seizures, relabeling or repackaging, total or partial suspensions of manufacturing or distribution, injunctions, fines, civil penalties or criminal prosecution.

The process required by the FDA before our product candidates are approved as drugs for therapeutic indications and may be marketed in the U.S. generally involves the following:

- completion of extensive preclinical studies in accordance with applicable regulations, including studies conducted in accordance with good laboratory practice, or GLP, requirements;
- submission to the FDA of an IND application, which must become effective before clinical trials may begin;
- approval by an institutional review board, or IRB, or independent ethics committee at each clinical trial site before each trial may be initiated;
- performance of adequate and well-controlled clinical trials in accordance with applicable IND regulations, good clinical practice, or GCP, requirements and other clinical trial-related regulations to establish the safety and efficacy of the investigational product for each proposed indication;
- submission to the FDA of an NDA;
- a determination by the FDA within 60 days of its receipt of an NDA, to accept the filing for review;
- satisfactory completion of one or more FDA pre-approval inspections 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 clinical trial sites that generated the data in support of the NDA;
- payment of user fees for FDA review of the NDA; and

- 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

Preclinical Studies and Clinical Trials for Drugs

Before testing any drug in humans, the product candidate must undergo rigorous preclinical testing. Preclinical studies include laboratory evaluations of drug chemistry, formulation and stability, as well as in vitro and animal studies to assess safety and in some cases to establish the rationale for therapeutic use. The conduct of preclinical studies is subject to federal and state regulations and requirements, including GLP requirements for safety/toxicology studies. The results of the preclinical studies, together with manufacturing information and analytical data must be submitted to the FDA as part of an IND. An IND is a request for authorization from the FDA to administer an investigational product to humans and must become effective before clinical trials may begin. Some long-term preclinical testing may continue after the IND is submitted. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises concerns or questions about the conduct of the clinical trial, including concerns that human research patients will be exposed to unreasonable health risks, and imposes a clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. Submission of an IND may result in the FDA not allowing clinical trials to commence or not allowing clinical trials to commence on the terms originally specified in the IND.

The clinical stage of development involves the administration of the product candidate to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control, in accordance with GCP requirements, which include the requirement that all research patients provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria and the parameters and criteria to be used in monitoring safety and evaluating effectiveness. Each protocol, and any subsequent amendments to the protocol, must be submitted to the FDA as part of the IND. Furthermore, each clinical trial must be reviewed and approved by an IRB for each institution at which the clinical trial will be conducted to ensure that the risks to individuals participating in the clinical trial are minimized and are reasonable related to the anticipated benefits. The IRB also approves the informed consent form that must be provided to each clinical trial subject or his or her legal representative, and must monitor the clinical trial until completed. The FDA, the IRB or the sponsor may suspend or discontinue a clinical trial at any time on various grounds, including a finding that the patients are being exposed to an unacceptable health risk. There also are requirements governing the reporting of ongoing clinical trials and completed clinical trials to public registries. Information about clinical trials, including clinical trials results, must be submitted within specific timeframes for publication on the www.clinicaltrials.gov website.

A sponsor who wishes to conduct a clinical trial outside of the U.S. may, but need not, obtain FDA authorization to conduct the clinical trial under an IND. If a foreign clinical trial is not conducted under an IND, the sponsor can submit data from the clinical trial to the FDA in support of an NDA. The FDA will accept a well-designed and well-conducted foreign clinical trial not conducted under an IND if the trial was conducted in accordance with GCP requirements, and the FDA is able to validate the data through an onsite inspection if deemed necessary.

Clinical trials to evaluate therapeutic indications to support NDAs for marketing approval are typically conducted in three sequential phases, which may overlap.

- *Phase 1*—Phase 1 clinical trials involve initial introduction of the investigational product into healthy human volunteers or patients with the target disease or condition. These studies are typically designed to test the safety, dosage tolerance, absorption, metabolism and distribution of the investigational product in humans, excretion the side effects associated with increasing doses, and, if possible, to gain early evidence of effectiveness.

- *Phase 2*—Phase 2 clinical trials typically involve administration of the investigational product to a limited patient population with a specified disease or condition to evaluate the preliminary efficacy, optimal dosages and dosing schedule and to identify possible adverse side effects and safety risks.

- *Phase 3*—Phase 3 clinical trials typically involve administration of the investigational product to an expanded patient population to further evaluate dosage, to provide statistically significant evidence of clinical efficacy and to further test for safety, generally at multiple geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the investigational product and to provide an adequate basis for product approval and physician labeling.

Post-approval trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication and are commonly intended to generate additional safety data regarding use of the product in a clinical setting. In certain instances, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval of an NDA.

Progress reports detailing the results of the clinical trials, among other information, must be submitted at least annually to the FDA. Written IND safety reports must be submitted to the FDA and the investigators fifteen days after the trial sponsor determines the information qualifies for reporting for serious and unexpected suspected adverse events, findings from other studies or animal or in vitro testing that suggest a significant risk for human volunteers and any clinically important increase in the severity or rate of a serious suspected adverse reaction over that listed in the investigator brochure. The sponsor must also notify the FDA of any unexpected fatal or life-threatening suspected adverse reaction as soon as possible but in no case later than seven calendar days after the sponsor's initial receipt of the information.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the chemistry and physical characteristics of the product candidate and finalize a process for manufacturing the drug product in commercial quantities in accordance with cGMP requirements.

The manufacturing process must be capable of consistently producing quality batches of the product candidate and manufacturers must develop, among other things, methods for testing the identity, strength, quality and purity of the final drug product. Additionally, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

U.S. Marketing Approval for Drugs

Assuming successful completion of the required clinical testing, the results of the preclinical studies and clinical trials, together with detailed information relating to the product's chemistry, manufacture, controls and proposed labeling, among other things, are submitted to the FDA as part of an NDA requesting approval to market the product for one or more indications. An NDA must contain proof of the drug's safety and efficacy. The marketing application may include both negative and ambiguous results of preclinical studies and clinical trials, as well as positive findings. Data may come from company-sponsored clinical trials intended to test the safety and efficacy of a product's use or from a number of 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 the FDA. FDA approval of an NDA must be obtained before a drug may be marketed in the U.S.

The FDA reviews all submitted NDAs before it accepts them for filing and may request additional information rather than accepting the NDA for filing. The FDA must make a decision on accepting an NDA for filing within 60 days of receipt, and such decision could include a refusal to file by the FDA. Once the submission is accepted for filing, the FDA begins an in-depth substantive review of the NDA. The FDA reviews an NDA to determine, among other things, whether the drug is safe and effective and whether the facility in which it is manufactured, processed, packaged or held meets standards designed to assure the product's continued safety, quality and purity. Under the goals and polices agreed to by the FDA under the Prescription Drug User Fee Act, or PDUFA, the FDA targets ten 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 for priority review. The FDA does not always meet its PDUFA goal dates for standard or priority NDAs, and the review process is often extended by FDA requests for additional information or clarification.

Further, under PDUFA, as amended, each NDA must be accompanied by a user fee. The FDA adjusts the PDUFA user fees on an annual basis. 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 also may require submission of a Risk Evaluation and Mitigation Strategy, or REMS, program to ensure that the benefits of the drug outweigh its risks. The REMS program could include medication guides, physician communication plans, assessment plans and/or elements to assure safe use, such as restricted distribution methods, patient registries or other risk-minimization tools.

The FDA may refer an application for a novel drug to an advisory committee. An advisory committee is a panel of independent experts, including clinicians and other scientific experts, which reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving an NDA, the FDA typically will inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving an NDA, the FDA may inspect one or more clinical trial sites to assure compliance with GCP and other requirements and the integrity of the clinical data submitted to the FDA.

After evaluating the NDA and all related information, including the advisory committee recommendation, if any, and inspection reports regarding the manufacturing facilities and clinical trial sites, the FDA may issue an approval letter, or, in some cases, a complete response letter. A complete response letter generally contains a statement of specific conditions that must be met in order to secure final approval of the NDA and may require additional clinical or preclinical testing in order for the FDA to reconsider the application. Even with submission of this additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval. If and when those conditions have been met to the FDA's satisfaction, the FDA will typically issue an approval letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications.

Even if the FDA approves a product, depending on the specific risk(s) to be addressed it may limit the approved indications for use of the product, require that contraindications, warnings or precautions be included in the product labeling, require that post-approval studies, including Phase 4 clinical trials, be conducted to further assess a drug's safety after approval, require testing and surveillance programs to monitor the product after commercialization or impose other conditions, including distribution and use restrictions or other risk management mechanisms under a REMS, which can materially affect the potential market and profitability of the product. The FDA may prevent or limit further marketing of a product based on the results of post-marketing studies or surveillance programs. After approval, some types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further testing requirements and FDA review and approval.

Orphan Drug Designation and Exclusivity

Under the Orphan Drug Act of 1983, the FDA may grant orphan designation to a drug intended to treat a rare disease or condition, which is a disease or condition that affects fewer than 200,000 individuals in the U.S., or if it affects more than 200,000 individuals in the U.S., there is no reasonable expectation that the cost of developing and making the product available in the U.S. for the disease or condition will be recovered from sales of the product. Orphan designation must be requested before submitting an NDA. Orphan designation does not convey any advantage in or shorten the duration of the regulatory review and approval process, though companies developing orphan products are eligible for certain incentives, including tax credits for qualified clinical testing and waiver of application fees.

If a product that has orphan designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to a seven-year period of marketing exclusivity during which the FDA may not approve any other applications to market the same therapeutic agent for the same indication, except in limited circumstances, such as a subsequent product's showing of clinical superiority over the product with orphan exclusivity or where the original applicant cannot produce sufficient quantities of product. Competitors, however, may receive approval of different therapeutic agents for the indication for which the orphan product has exclusivity or obtain approval for the same therapeutic agent for a different indication than that for which the orphan product has exclusivity. Orphan product exclusivity could block the approval of one of our products for seven years if a competitor obtains approval for the same therapeutic agent for the same indication before we do,

unless we are able to demonstrate that our product is clinically superior. If an orphan designated product receives marketing approval for an indication broader than what is designated, it may not be entitled to orphan exclusivity. Further, orphan drug exclusive marketing rights in the U.S. may be lost if the FDA later determines that the request for designation was materially defective or the manufacturer of the approved product is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition.

Expedited Development and Review Programs for Drugs

The FDA maintains several programs intended to facilitate and expedite development and review of new drugs to address unmet medical needs in the treatment of serious or life-threatening diseases or conditions. These programs include Fast Track designation, Breakthrough Therapy designation, Priority Review and Accelerated Approval, and the purpose of these programs is to either expedite the development or review of important new drugs to get them to patients earlier than under standard FDA development and review procedures.

A new drug is eligible for Fast Track designation if it is intended to treat a serious or life-threatening disease or condition and demonstrates the potential to address unmet medical needs for such disease or condition. Fast Track designation provides increased opportunities for sponsor interactions with the FDA during preclinical and clinical development, in addition to the potential for rolling review once a marketing application is filed, meaning that the agency may review portions of the marketing application before the sponsor submits the complete application, as well as Priority Review, discussed below.

In addition, a new drug may be eligible for Breakthrough Therapy designation if it is intended to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. Breakthrough Therapy designation provides all the features of Fast Track designation in addition to intensive guidance on an efficient drug development program beginning as early as Phase 1, and FDA organizational commitment to expedited development, including involvement of senior managers and experienced review staff in a cross-disciplinary review, where appropriate.

Any product submitted to the FDA for approval, including a product with Fast Track or Breakthrough Therapy designation, may also be eligible for additional FDA programs intended to expedite the review and approval process, including Priority Review designation and Accelerated Approval. A product is eligible for Priority Review if it has the potential to provide a significant improvement in safety or effectiveness in the treatment, diagnosis or prevention of a serious disease or condition. Under Priority Review, the FDA must review an application in six months compared to ten months for a standard review.

Additionally, products are eligible for Accelerated Approval if they can be shown to have an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or an effect on a clinical endpoint that can be measured earlier than an effect on irreversible morbidity or mortality which is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity or prevalence of the condition and the availability or lack of alternative treatments.

Accelerated Approval is usually contingent on a sponsor's agreement to conduct additional post-approval studies to verify and describe the product's clinical benefit. The FDA may withdraw approval of a drug or indication approved under Accelerated Approval if, for example, the confirmatory trial fails to verify the predicted clinical benefit of the product. In addition, unless otherwise informed by the FDA, the FDA currently requires, as a condition for Accelerated Approval, that all advertising and promotional materials that are intended for dissemination or publication within 120 days following marketing approval be submitted to the agency for review during the pre-approval review period, and that after 120 days following marketing approval, all advertising and promotional materials must be submitted at least 30 days prior to the intended time of initial dissemination or publication.

Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or the time period for FDA review or approval may not be shortened. Furthermore, Fast Track designation, Breakthrough Therapy designation, Priority Review and Accelerated Approval do not change the scientific or medical standards for approval or the quality of evidence necessary to support approval but may expedite the development or review process.

U.S. Post-Approval Requirements for Drugs

Drugs manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, reporting of adverse experiences with the product, complying with promotion and advertising requirements, which include restrictions on promoting products for unapproved uses or patient populations (known as "off-label use") and limitations on industry-sponsored scientific and educational activities. Although physicians may prescribe legally available products for off-label uses, manufacturers may not market or promote such uses. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability, including investigation by federal and state authorities. Prescription drug promotional materials must be submitted to the FDA in conjunction with their first use or first publication. Further, if there are any modifications to the drug, including changes in indications, labeling or manufacturing processes or facilities, the applicant may be required to submit and obtain FDA approval of a new NDA or NDA supplement, which may require the development of additional data or preclinical studies and clinical trials.

The FDA may impose a number of post-approval requirements as a condition of approval of an NDA. For example, the FDA may require post-market testing, including Phase 4 clinical trials, and surveillance to further assess and monitor the product's safety and effectiveness after commercialization.

In addition, drug manufacturers and their subcontractors involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and certain state agencies and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with ongoing regulatory requirements, including cGMP, which impose certain procedural and documentation requirements upon us and our contract manufacturers. Failure to comply with statutory and regulatory requirements can subject a manufacturer to possible legal or regulatory action, such as warning letters, suspension of manufacturing, product seizures, injunctions, civil penalties or criminal prosecution. There is also a continuing, annual prescription drug product program user fee.

Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information, requirements for post-market studies or clinical trials to assess new safety risks, or imposition of distribution or other restrictions under a REMS. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- safety alerts, Dear Healthcare Provider letters, press releases or other communications containing warnings or other safety information about the product;
- fines, warning letters or holds on post-approval clinical trials;
- refusal of the FDA to approve applications or supplements to approved applications, or withdrawal of product approvals;
- product seizure or detention, or refusal to permit the import or export of products;
- injunctions or the imposition of civil or criminal penalties; and
- consent decrees, corporate integrity agreements, debarment or exclusion from federal healthcare programs; or mandated modification of promotional materials and labeling and issuance of corrective information.

Other Regulatory Matters

Manufacturing, sales, promotion and other activities of product candidates following product approval, where applicable, or commercialization are also subject to regulation by numerous regulatory authorities in the U.S. in addition to the FDA, which may include the Centers for Medicare & Medicaid Services, or CMS, other divisions of

the Department of Health and Human Services, the Department of Justice, the Drug Enforcement Administration, the Consumer Product Safety Commission, the Federal Trade Commission, the Occupational Safety & Health Administration, the Environmental Protection Agency and state and local governments and governmental agencies.

Healthcare Reform

In March 2010, Congress passed the Affordable Care Act, or the ACA, a sweeping law intended to broaden access to health insurance, reduce or constrain the growth of health spending, enhance remedies against fraud and abuse, add new transparency requirements for the healthcare and health insurance industries, impose new taxes and fees on the health industry, and impose additional policy reforms. The ACA, for example, contains provisions that subject products to potential competition by lower-cost products and may reduce the profitability of products through increased rebates for drugs reimbursed by Medicaid programs; address a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, increase the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extends the rebate program to individuals enrolled in Medicaid managed care organizations; establish annual fees and taxes on manufacturers of certain branded prescription drugs; and create a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% (increased to 70% pursuant to the Bipartisan Budget Act of 2018, or BBA, effective as of 2019) point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D.

Since its enactment, there have been judicial, administrative, executive and Congressional legislative challenges to certain aspects of the ACA, and we expect there will be additional challenges and amendments to the ACA in the future. For example, on June 17, 2021 the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. In addition, on August 16, 2022, President Biden signed the Inflation Reduction Act of 2022 ("IRA") into law, which among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in ACA marketplaces through plan year 2025. The IRA also eliminates the "donut hole" under the Medicare Part D program beginning in 2025 by significantly lowering the beneficiary maximum out-of-pocket cost and creating a new manufacturer discount program. It is unclear how any additional challenges and healthcare reform measures of the Biden administration will impact the ACA and our business.

Other federal health reform measures have been proposed and adopted in the U.S. since the ACA was enacted:

- The Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. These changes included aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect in April 2013 and, due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2031, unless additional Congressional action is taken. Under current legislation the actual reduction in Medicare payments will vary from 1% in 2022 to up to 4% in the final fiscal year of this sequester.

- The American Taxpayer Relief Act of 2012, among other things, reduced Medicare payments to several providers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

- The Middle Class Tax Relief and Job Creation Act of 2012 required that CMS reduce the Medicare clinical laboratory fee schedule by 2% in 2013, which served as a base for 2014 and subsequent years.

- In addition, effective January 1, 2014, CMS also began bundling the Medicare payments for certain laboratory tests ordered while a patient received services in a hospital outpatient setting.

Further, there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which have resulted in several recent Congressional inquiries and proposed and enacted bills designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for

products. In addition, the U.S. government, state legislatures, and foreign governments have shown significant interest in implementing cost containment programs, including price-controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs to limit the growth of government paid healthcare costs. For example, the U.S. government has passed legislation requiring pharmaceutical manufacturers to provide rebates and discounts to certain entities and governmental payors to participate in federal healthcare programs. Further, in July 2021, the Biden administration released an executive order, "Promoting Competition in the American Economy," with multiple provisions aimed at prescription drugs. In response to Biden's executive order, on September 9, 2021, the U.S. Department of Health and Human Services ("HHS"), released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and sets out a variety of potential legislative policies that Congress could pursue as well as potential administrative actions HHS can take to advance these principles. In addition, the IRA, among other things, (i) directs HHS to negotiate the price of certain high-expenditure, single-source drugs and biologics covered under Medicare, and subject drug manufacturers to civil monetary penalties and a potential excise tax by offering a price that is not equal to or less than the negotiated "maximum fair price" for such drugs and biologics under the law, and (ii) imposes rebates with respect to certain drugs and biologics covered under Medicare Part B or Medicare Part D to penalize price increases that outpace inflation. The IRA permits HHS to implement many of these provisions through guidance, as opposed to regulation, for the initial years. These provisions will take effect progressively starting in fiscal year 2023, although they may be subject to legal challenges. It is currently unclear how the IRA will be implemented but is likely to have a significant impact on the pharmaceutical industry. Further, the Biden administration released an additional executive order on October 14, 2022, directing HHS to submit a report on how the Center for Medicare and Medicaid Innovation can be further leveraged to test new models for lowering drug costs for Medicare and Medicaid beneficiaries. It is unclear whether this executive order or similar policy initiatives will be implemented in the future. Individual states in the U.S. have also been increasingly passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing.

From time to time, legislation is drafted, introduced, and passed in Congress that could significantly change the statutory provisions governing the sale, marketing, coverage, and reimbursement of products regulated by CMS or other government agencies. In addition to new legislation, CMS regulations and policies are often revised or interpreted by the agency in ways significantly affecting our business and our products.

Other Healthcare Laws and Regulations

If we obtain regulatory approval of our products, we may be subject to various federal and state laws targeting fraud and abuse in the healthcare industry. These laws may impact, among other things, our proposed sales and marketing strategies. In addition, we may be subject to patient privacy regulation by both the federal government and the states in which we conduct our business. These laws include, without limitation, state and federal anti-kickback, fraud and abuse, false claims, privacy and security, and physician sunshine laws and regulations.

The federal Anti-Kickback Statute prohibits, among other things, any person from knowingly and willfully offering, soliciting, receiving or paying remuneration (a term interpreted broadly to include anything of value, including, for example, gifts, discounts and credits), directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, an item or reimbursable, in whole or in part, under a federal healthcare program, such as the Medicare and Medicaid programs. Violations of the federal Anti-Kickback Statute can result in significant civil monetary and criminal penalties, per kickback plus three times the amount of remuneration and a prison term per violation. Further, violation of the federal Anti-Kickback Statute can also form the basis for False Claims Act liability (discussed below). 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. In addition, many states have adopted laws similar to the federal Anti-Kickback Statute, some of which apply to the referral of patients for healthcare items or services reimbursed by any source, not only government programs.

Additionally, the civil False Claims Act (the "FCA") prohibits knowingly presenting or causing the presentation of a false, fictitious or fraudulent claim for payment to the U.S. government. Actions under the FCA may be brought by the Attorney General or as a qui tam action by a private individual in the name of the government. Violations of the FCA can result in very significant monetary penalties, for each false claim and treble the amount of the government's damages. Manufacturers can be held liable under the FCA even when they do not submit claims directly to government payors if they are deemed to "cause" the submission of false or fraudulent claims. The federal

government continues to use the FCA, and the accompanying threat of significant liability, in its investigations and prosecutions of pharmaceutical and biotechnology companies throughout the U.S. Such investigations and prosecutions frequently involve, for example, the alleged promotion of products for unapproved uses and other sales and marketing practices. The government has obtained multi-million and multi-billion dollar settlements under the FCA in addition to individual criminal convictions under applicable criminal statutes. Given the significant size of actual and potential settlements, it is expected that the government will continue to devote substantial resources to investigating healthcare providers' and manufacturers' compliance with the FCA and other applicable fraud and abuse laws.

We may be subject to the federal Civil Monetary Penalties Law, which prohibits, among other things, the offering or transferring of remuneration to a Medicare or Medicaid beneficiary that the person knows or should know is likely to influence the beneficiary's selection of a particular supplier of Medicare or Medicaid payable items or services. Federal government price reporting laws require manufacturers to calculate and report complex pricing metrics to government programs.

The U.S. federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, includes a fraud and abuse provision referred to as the HIPAA All-Payor Fraud Law, which imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services. Similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation.

We may also be subject to federal transparency laws, including the federal Physician Payment Sunshine Act, which was part of the ACA and requires manufacturers of certain drugs and biologics, among others, to track and disclose payments and other transfers of value they make to U.S. physicians (defined to include doctors, dentists, optometrists, podiatrists, and chiropractors), other healthcare professionals (such as physician assistants and nurse practitioners), and teaching hospitals, as well as ownership and investment interests in the manufacturer held by such physicians and their immediate family members. This information is subsequently made publicly available in a searchable format on a CMS website. Failure to disclose required information may result in civil monetary penalties for all payments, transfers of value or ownership or investment interests that are not timely, accurately and completely reported in an annual submission. Certain states also mandate implementation of compliance programs, impose restrictions on drug manufacturer marketing practices and/or require the tracking and reporting of gifts, compensation and other remuneration to physicians and/or other healthcare providers.

As noted above, analogous state laws and regulations, such as, state anti-kickback and false claims laws may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers. Some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other healthcare providers or marketing expenditures. There are also state and local laws that require the registration of pharmaceutical sales representatives.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies have recently increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. 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, disgorgement, contractual damages, reputational harm, diminished profits and future earnings, imprisonment, exclusion of drugs from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations, as well as additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws, any of which could adversely affect our ability to operate our business and our financial results. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to significant criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. Ensuring business arrangements comply with applicable healthcare

laws, as well as responding to possible investigations by government authorities, can be time- and resource consuming and can divert a company's attention from the business.

Data Privacy and Security

In the ordinary course of business, we collect, receive, store, process, generate, use, transfer, disclose, make accessible, protect, secure, dispose of, transmit, and share (collectively, process) personal information, such as clinical trial data and other health data. Accordingly, we may be subject to numerous data privacy and security obligations, including federal, state, local, and foreign laws, regulations, guidance, industry standards, external and internal privacy and security policies, contractual requirements and other obligations related to data privacy and security.

These frameworks are evolving and may impose potentially conflicting obligations. Such obligations may include, without limitation, the Federal Trade Commission Act, the California Consumer Privacy Act of 2018, as amended by the California Privacy Rights Act of 2020 ("CPRA") (collectively, "CCPA"), the European Union's General Data Protection Regulation 2016/679 ("EU GDPR"), the EU GDPR as it forms part of United Kingdom law by virtue of section 3 of the European Union (Withdrawal) Act 2018 ("UK GDPR"), the ePrivacy Directive, and wiretapping laws. Further. HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, and its implementing regulations, imposes certain requirements relating to the privacy, security and transmission of protected health information.

Many states also have laws governing the privacy and security of health information and other personal 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. For example, the CCPA applies to personal information of consumers, business representatives, and employees who are California residents, places increased privacy and security obligations on entities handling personal information of such California residents or households, requires covered companies to provide certain disclosures to such California residents about its data collection, use and sharing practices, and requires covered companies to provide such California residents with ways to opt-out of certain sales or transfers of personal information. In addition, the CPRA expanded the CCPA's requirements.

Additionally, European data privacy and security laws (including the EU GDPR and UK GDPR) impose significant and complex compliance obligations on companies that are subject to those laws, notably with respect to the processing of health-related data from EEA or UK-based individuals.

Coverage and Reimbursement

Market acceptance and sales of approved products depends in part on the extent to which reimbursement for these drugs and related treatments will be available from third-party payors, including government health administration authorities, managed care organizations and other private health insurers. Third-party payors decide which therapies they will pay for and establish reimbursement levels. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own coverage and reimbursement policies. Additionally, a third-party payor's decision to provide coverage for a therapy does not imply that an adequate reimbursement rate will be approved. Even if favorable coverage and reimbursement status is attained for any product candidate, less favorable coverage policies and reimbursement rates may be implemented in the future. Patients are unlikely to use our drugs unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our drugs. A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. If coverage and adequate reimbursement are not available, or are available only at limited levels, we may not be able to successfully commercialize our current and any future product candidates that we develop.

Government Regulation of Drugs Outside of the United States

To market any product outside of the U.S., we would need to comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy and governing, among other things, clinical trials, marketing authorization, manufacturing, commercial sales and distribution of our products. To obtain a Marketing Authorization, or MA, for a product in the European Economic Area, or the EEA (comprised of the 27 EU Member States plus Iceland, Liechtenstein and Norway), for example an applicant must be established within the EEA. The applicant must submit a Marketing Authorization Application, or MAA, either under a centralized procedure administered by the EMA or one of the procedures administered by competent authorities in the EEA countries

(decentralized procedure, national procedure or mutual recognition procedure). An MA may be granted only to an applicant established in the EEA.

The centralized procedure provides for the grant of a single MA by the European Commission that is valid for all EEA countries. Pursuant to Regulation (EC) No 726/2004, the centralized procedure is compulsory for specific products, including for (i) medicinal products derived from biotechnological processes, (ii) products designated as orphan medicinal products, (iii) advanced therapy medicinal products, or ATMPs, and (iv) products with a new active substance indicated for the treatment of HIV/AIDS, cancer, neurodegenerative diseases, diabetes, auto-immune and other immune dysfunctions and viral diseases. For products with a new active substance indicated for the treatment of other diseases and products that are highly innovative or for which a centralized process is in the interest of patients, authorization through the centralized procedure is optional on related approval.

Under the centralized procedure, the EMA's Committee for Medicinal Products for Human Use, or CHMP, conducts the initial assessment of a product. The CHMP is also responsible for several post-authorization and maintenance activities, such as the assessment of modifications or extensions to an existing MA. Under the centralized procedure in the EEA, the maximum timeframe for the evaluation of an MAA is 210 days, excluding clock stops when additional information or written or oral explanation is to be provided by the applicant in response to questions of the CHMP. Accelerated assessment may be granted by the CHMP in exceptional cases, when a medicinal product targeting an unmet medical need is expected to be of major interest from the point of view of public health and, in particular, from the viewpoint of therapeutic innovation. If the CHMP accepts a request for accelerated assessment, the time limit of 210 days will be reduced to 150 days (excluding clock stops). The CHMP can, however, revert to the standard time limit for the centralized procedure if it considers that it is no longer appropriate to conduct an accelerated assessment.

Unlike the centralized authorization procedure, the decentralized MA procedure requires a separate application to, and leads to separate approval by, the competent authorities of each EEA country in which the product is to be marketed. This application is identical to the application that would be submitted to the EMA for authorization through the centralized procedure. The reference Member State prepares a draft assessment and drafts of the related materials within 120 days after receipt of a valid application. The resulting assessment report is submitted to the concerned EEA countries who, within 90 days of receipt, must decide whether to approve the assessment report and related materials. If a concerned EU Member State cannot approve the assessment report and related materials due to concerns relating to a potential serious risk to public health, disputed elements may be referred to the Heads of Medicines Agencies' Coordination Group for Mutual Recognition and Decentralised Procedures – Human, or CMDh, for review. The subsequent decision of the European Commission is binding on all EEA countries.

The mutual recognition procedure allows companies that have a medicinal product already authorized in one EEA country to apply for this authorization to be recognized by the competent authorities in other EEA countries. Like the decentralized procedure, the mutual recognition procedure is based on the acceptance by the competent authorities of the EEA countries of the MA of a medicinal product by the competent authorities of other EEA countries. The holder of a national MA may submit an application to the competent authority of an EEA country requesting that this authority recognize the MA delivered by the competent authority of another EEA country.

An MA has, in principle, an initial validity of five years. The MA may be renewed after five years on the basis of a re-evaluation of the risk-benefit balance by the EMA or by the competent authority of the EEA country in which the original MA was granted. To support the application, the MA holder must provide the EMA or the competent authority with a consolidated version of the eCTD (Common Technical Document) providing up-to-date data concerning the quality, safety and efficacy of the product, including all variations introduced since the MA was granted, at least nine months before the MA ceases to be valid. The European Commission or the competent authorities of the EEA countries may decide on justified grounds relating to pharmacovigilance, to proceed with one further five year renewal period for the MA. Once subsequently definitively renewed, the MA shall be valid for an unlimited period. Any authorization which is not followed by the actual placing of the medicinal product on the EU market (for a centralized MA) or on the market of the authorizing EEA country within three years after authorization ceases to be valid (the so-called sunset clause).

Innovative products that target an unmet medical need and are expected to be of major public health interest may be eligible for a number of expedited development and review programs, such as the Priority Medicines, or PRIME, scheme, which provides incentives similar to the breakthrough therapy designation in the U.S. PRIME is a voluntary scheme aimed at enhancing the EMA's support for the development of medicinal products that target unmet

medical needs. Eligible products must target conditions for which there is an unmet medical need (there is no satisfactory method of diagnosis, prevention or treatment in the EU or, if there is, the new medicinal product will bring a major therapeutic advantage) and they must demonstrate the potential to address the unmet medical need by introducing new methods of therapy or improving existing ones. Benefits accrue to sponsors of product candidates with PRIME designation, including but not limited to, early and proactive regulatory dialogue with the EMA, frequent discussions on clinical trial designs and other development program elements, and potentially accelerated MAA assessment once a dossier has been submitted.

In the EEA, a "conditional" MA may be granted in cases where all the required safety and efficacy data are not yet available. The European Commission may grant a conditional MA for a medicinal product if it is demonstrated that all of the following criteria are met: (i) the benefit-risk balance of the medicinal product is positive; (ii) it is likely that the applicant will be able to provide comprehensive data post-authorization; (iii) the medicinal product fulfils an unmet medical need; and (iv) the benefit of the immediate availability to patients of the medicinal product is greater than the risk inherent in the fact that additional data are still required. The conditional MA is subject to conditions to be fulfilled for generating the missing data or ensuring increased safety measures. It is valid for one year and must be renewed annually until all related conditions have been fulfilled. Once any pending studies are provided, the conditional MA can be converted into a traditional MA. However, if the conditions are not fulfilled within the timeframe set by the EMA and approved by the European Commission, the MA will cease to be renewed.

An MA may also be granted "under exceptional circumstances" where the applicant can show that it is unable to provide comprehensive data on efficacy and safety under normal conditions of use even after the product has been authorized and subject to specific procedures being introduced. These circumstances may arise in particular when the intended indications are very rare and, in the state of scientific knowledge at that time, it is not possible to provide comprehensive information, or when generating data may be contrary to generally accepted ethical principles. Like a conditional MA, an MA granted in exceptional circumstances is reserved to medicinal products intended to be authorized for treatment of rare diseases or unmet medical needs for which the applicant does not hold a complete data set that is required for the grant of a standard MA. However, unlike the conditional MA, an applicant for authorization in exceptional circumstances is not subsequently required to provide the missing data. Although the MA "under exceptional circumstances" is granted definitively, the risk-benefit balance of the medicinal product is reviewed annually, and the MA will be withdrawn if the risk-benefit ratio is no longer favorable.

Upon grant of a MA in the EEA, innovative medicinal products generally benefit from eight years of data exclusivity and an additional two years of market exclusivity. If granted, data exclusivity prevents generic or biosimilar applicants from referencing the innovator's pre-clinical and clinical trial data contained in the dossier of the reference product when applying for a generic or biosimilar marketing authorization during a period of eight years from the date on which the reference product was first authorized in the EEA. During the additional two year period of market exclusivity, a generic or biosimilar marketing authorization can be submitted, and the innovator's data may be referenced, but no generic or biosimilar product can be marketed until the expiration of the market exclusivity period. The overall ten year period will be extended to a maximum of eleven years if, during the first eight years of those ten years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to authorization, is held to bring a significant clinical benefit in comparison with existing therapies.

In the EEA, there is a special regime for biosimilars, or biological medicinal products that are similar to a reference medicinal product but that do not meet the definition of a generic medicinal product. For such products, the results of appropriate preclinical or clinical trials must be provided in support of an application for marketing authorization. Guidelines from the EMA detail the type of quantity of supplementary data to be provided for different types of biological product.

EU Post-Approval Requirements

Where an MA is granted in relation to a medicinal product in the EEA, the holder of the MA is required to comply with a range of regulatory requirements applicable to the manufacturing, marketing, promotion and sale of medicinal products. Similar to the United States, both MA holders and manufacturers of medicinal products are subject to comprehensive regulatory oversight by the EMA, the European Commission and/or the competent regulatory authorities of the individual EEA countries. The holder of an MA must establish and maintain a pharmacovigilance system and appoint an individual qualified person for pharmacovigilance who is responsible for oversight of that

system. Key obligations include expedited reporting of suspected serious adverse reactions and submission of periodic safety update reports, or PSURs.

All new MAAs must include a risk management plan, or RMP, describing the risk management system that the company will put in place and documenting measures to prevent or minimize the risks associated with the product. The regulatory authorities may also impose specific obligations as a condition of the MA. Such risk-minimization measures or post-authorization obligations may include additional safety monitoring, more frequent submission of PSURs, or the conduct of additional clinical trials or post-authorization safety studies.

In the EEA, the advertising and promotion of medicinal products are subject to both EU and EEA countries' laws governing promotion of medicinal products, interactions with physicians and other healthcare professionals, misleading and comparative advertising and unfair commercial practices. Although general requirements for advertising and promotion of medicinal products are established under EU legislation, the details are governed by regulations in individual EEA countries and can differ from one country to another. For example, applicable laws require that promotional materials and advertising in relation to medicinal products comply with the product's Summary of Product Characteristics, or SmPC, as approved by the competent authorities in connection with an MA. The SmPC is the document that provides information to physicians concerning the safe and effective use of the product. Promotional activity that does not comply with the SmPC is considered off-label and is prohibited in the EEA. Direct-to-consumer advertising of prescription medicinal products is also prohibited in the EEA.

Orphan designation in the EU

The criteria for designating an "orphan medicinal product" in the EEA are similar in principle to those in the U.S. In the EEA a medicinal product may be designated as orphan if (1) it is intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition; (2) either (a) such condition affects no more than five in 10,000 persons in the EU when the application is made, or (b) the product, without the benefits derived from orphan status, would not generate sufficient return in the EU to justify investment; and (3) there exists no satisfactory method of diagnosis, prevention or treatment of such condition authorized for marketing in the EU, or if such a method exists, the product will be of significant benefit to those affected by the condition. Orphan medicinal products are eligible for financial incentives such as reduction of fees or fee waivers and are, upon grant of a marketing authorization, entitled to ten years of market exclusivity for the approved therapeutic indication. During this ten-year orphan market exclusivity period, no marketing authorization application shall be accepted, and no marketing authorization shall be granted for a similar medicinal product for the same indication. An orphan product can also benefit from an additional two years of market exclusivity in the EU for pediatric studies. The ten-year market exclusivity period may be reduced to six years if, at the end of the fifth year, it is established that the product no longer meets the criteria for orphan designation, for example, if the product is sufficiently profitable not to justify maintenance of market exclusivity. Additionally, marketing authorization may be granted to a similar product for the same indication at any time if (i) the second applicant can establish that its product, although similar, is safer, more effective or otherwise clinically superior; (ii) the applicant consents to a second orphan medicinal product application; or (iii) the applicant cannot supply enough orphan medicinal product.

Similar to the United States, the various phases of non-clinical and clinical research in the European Union are subject to significant regulatory controls.

Conduct of clinical trials in the EU

In the EU, clinical trials are governed by the Clinical Trials Regulation (EU) No 536/2014, or CTR, which entered into application on January 31, 2022 repealing and replacing the former Clinical Trials Directive 2001/20, or CTD, and related national implementing legislation of EU Member States.

The CTR is intended to harmonize and streamline clinical trial authorizations, simplify adverse-event reporting procedures, improve the supervision of clinical trials and increasing their transparency. Specifically, the Regulation, which is directly applicable in all EU Member States, introduces a streamlined application procedure through a single-entry point, the "EU portal", the Clinical Trials Information System, or CTIS; a single set of documents to be prepared and submitted for the application; as well as simplified reporting procedures for clinical trial sponsors. A harmonized procedure for the assessment of applications for clinical trials has been introduced and is divided into two parts. Part I assessment is led by the competent authorities of a reference Member State selected by the trial sponsor and relates to clinical trial aspects that are considered to be scientifically harmonized across EU

Member States. This assessment is then submitted to the competent authorities of all concerned Member States in which the trial is to be conducted for their review. Part II is assessed separately by the competent authorities and Ethics Committees in each concerned EU Member State. Individual EU Member States retain the power to authorize the conduct of clinical trials on their territory.

The extent to which on-going clinical trials will be governed by the CTR will depend on the duration of the individual clinical trial. For clinical trials in relation to which application for approval was made on the basis of the CTD before January 31, 2022, the CTD will continue to apply on a transitional basis for three years. If authorized, those clinical trials will be governed by the CTD until January 31, 2025. By that date, all ongoing trials will become subject to the provisions of the CTR. The CTR will apply to clinical trials from an earlier date if the clinical trial has already transitioned to the CTR framework. Since January 31, 2023 all new requests for approval of clinical trials must be based on the CTR.

Should we utilize third-party distributors, compliance with such foreign governmental regulations would generally be the responsibility of such distributors, who may be independent contractors over whom we have limited control.

The position in the United Kingdom

Following the result of a referendum in 2016, the United Kingdom (UK) left the European Union on January 31, 2020, commonly referred to as Brexit. The UK and the European Union have signed an EU-UK Trade and Cooperation Agreement, or TCA, which became provisionally applicable on January 1, 2021 and entered into force on May 1, 2021. The Annex provides a framework for the recognition of Good Manufacturing Practice, or GMP, inspections and for the exchange and acceptance of official GMP documents. The regime does not, however, extended to procedures such as batch release certification.

As part of the TCA, the European Union and the UK will recognize Good Manufacturing Practice inspections carried out by the other party and the acceptance of official GMP documents issued by the other party. The TCA also encourages, although it does not oblige, the parties to consult one another on proposals to introduce significant changes to technical regulations or inspection procedures. Among the areas of absence of mutual recognition are batch testing and batch release. The UK has unilaterally agreed to accept European Union batch testing and batch release However, the European Union continues to apply European Union laws that require batch testing and batch release to take place in the European Union territory. This means that medicinal products that are tested and released in the UK must be retested and re-released when entering the European Union market for commercial use.

As regards marketing authorizations, Great Britain has a separate regulatory submission process, approval process and a national marketing authorization. Northern Ireland will, however, continue to be covered by the marketing authorizations granted by the European Commission. Since January 1, 2021, an applicant for a centralized procedure marketing authorization can no longer be established in the UK. Since this date, companies established in the UK cannot use the centralized procedure and instead must follow one of the UK national authorization procedures to obtain an MA to market products in the UK. The MHRA has been updating various aspects of the regulatory regime for medicinal products in the UK. These include: introducing the Innovative Licensing and Access Procedure to accelerate the time to market and facilitate patient access for innovative medicinal products; updates to the UK national approval procedure, introducing a 150-day objective for assessing applications for marketing authorizations in the UK, Great Britain and Northern Ireland and a rolling review process for marketing authorization applications (rather than a consolidated full dossier submission).

Orphan designation in Great Britain following Brexit is, unlike in the EU, not available pre-marketing authorization. Applications for orphan designation are made at the same time as an application for a marketing authorization. The criteria to be granted an orphan medicinal product designation or essentially identical to those in the EU but based on the prevalence of the condition in Great Britain.

The UK regulatory framework in relation to clinical trials is derived from existing EU legislation (as implemented into UK law, through secondary legislation). However, it is currently unclear to what extent the UK will seek to align its regulations with the EU following entry into application of the Clinical Trials Regulation on January 31, 2022.

U.S. Patent Term Restoration and Marketing Exclusivity

Depending upon the timing, duration and specifics of FDA approval of our future product candidates, some 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, commonly referred to as the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit restoration of the patent term of up to five years as compensation for patent term lost during the FDA regulatory review process. Patent-term restoration, however, cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date and only those claims covering such approved drug product, a method for using it or a method for manufacturing it may be extended. The patent-term restoration period is generally one-half the time between the effective date of an IND and the submission date of an NDA plus the time between the submission date of an NDA and the approval of that application, except that the review period is reduced by any time during which the applicant failed to exercise due diligence. Only one patent applicable to an approved drug is eligible for the extension and the application for the extension must be submitted prior to the expiration of the patent. The USPTO, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. In the future, we may apply for restoration of patent term for our currently owned or licensed patents to add patent life beyond its current expiration date, depending on the expected length of the clinical trials and other factors involved in the filing of the relevant NDA.

Marketing exclusivity provisions under the FD&C Act also can delay the submission or the approval of certain applications. The FD&C Act provides a five-year period of non-patent marketing exclusivity within the United States to the first applicant to gain approval of an NDA for a new chemical entity. A drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance. During the exclusivity period, the FDA may not accept for review an abbreviated new drug application, or ANDA, or a 505(b)(2) NDA submitted by another company for another version of such drug where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement. The FD&C Act also provides three years of marketing exclusivity for an NDA, 505(b)(2) NDA or supplement to an existing NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example, new indications, dosages or strengths of an existing drug. This three-year exclusivity covers only the conditions of use associated with the new clinical investigations and does not prohibit the FDA from approving ANDAs for drugs containing the original active agent. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

Employees and Human Capital Resources

As of December 31, 2022, we had twenty-eight full-time employees and three part-time employees. Fourteen employees are based in Barcelona, Spain, eleven employees are based in Lugano, Switzerland, two employees are based in the U.K. and four employees are based in Bethesda, Maryland. Of these thirty-one employees, twenty-two are engaged in research and development activities and nine are engaged in finance, investor relations, business development and general management. Our employees in Spain are subject to a national collective labor agreement, the "*Convenio General de la Industria Quimica"*. National agreements are negotiated collectively between the national associations of companies within a given industry and the respective national unions. We consider our relationship with our employees to be good and have not experienced any work stoppages. In addition, we maintain consulting arrangements with a number of scientists at various universities and other research institutions in Europe, Switzerland and the United States, including with the four external members of our Scientific Advisory Board. Our human capital resources objectives include, as applicable, identifying, recruiting, retaining, incentivizing and integrating our existing and additional employees. We maintain our equity incentive plan in order to attract, retain and incentivize our workforce through the granting of stock-based compensation. We also provide cash bonus awards based on Company progress toward key annual goals and employee performance.

Available Information

We maintain an internet website at www.gaintherapeutics.com and make available free of charge through our website our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Sections 13(a) and 15(d) of the Exchange Act of 1934, or the Exchange Act. We make these reports available through our website as soon as reasonably practicable after we

electronically file such reports with, or furnish such reports to, the Securities and Exchange Commission, or the SEC. You can review our electronically filed reports and other information that we file with the SEC on the SEC's web site at http://www.sec.gov. In addition, we regularly use our website to post information regarding our business, product development programs and governance, and we encourage investors to use our website, specifically the section titled "Investor Relations" as a source of information about us. The information on our website is not incorporated by reference into this Annual Report and should not be considered to be part of this Annual Report. Our website address is included in this Annual Report as an inactive technical reference only.

ITEM 1A. RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the following risks and other information in this Annual Report in evaluating us and our Common Stock. Any of the following risks could materially and adversely affect our results of operations, our financial condition, and the market price of our Common Stock. Although the risk factors are grouped by general category, many of the risks described in a given category relate to multiple categories. The risks described below are not the only ones that we face. Additional risks not presently known to us or that we currently deem immaterial may also affect our business, operating results, prospects or financial condition. See "Cautionary Statement Regarding Forward-Looking Statements" in this Annual Report. If any of these risks actually materialize, our business, prospects, financial condition and results of operations could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment.

Risk Factor Summary

We are providing the following summary of the risk factors contained in this Annual Report to enhance the readability and accessibility of our risk factor disclosures. We encourage you to carefully review the full risk factors contained in this Annual Report in their entirety for additional information regarding the material factors that make an investment in our securities speculative or risky. These risks and uncertainties include, but are not limited to, the following:

- we have a history of operating losses and expect to incur losses for the foreseeable future. We may never generate revenues or, if we are able to generate revenues, achieve profitability;
- we have a limited operating history, and we expect a number of factors to cause our operating results to fluctuate on a quarterly and annual basis, which may make it difficult to predict our future performance;
- if preclinical studies or clinical trials for our product candidates cannot be initiated or completed or if they are delayed or unsuccessful, we will be unable to meet our future development and commercialization goals;
- the disorders we seek to treat have low prevalence and it may be difficult to identify patients with these disorders, which may lead to delays in enrollment for our trials or slower commercial revenue if approved, and we may also face enrollment challenges as a result of other factors;
- our product candidates are novel and still in development. If we are unable to successfully develop, receive regulatory approval for and commercialize our current or future product candidates, our business will be harmed;
- we have not tested any of our product candidates in clinical trials. Success in early preclinical studies or clinical trials may not be indicative of results obtained in later preclinical studies and clinical trials;
- clinical trials required for our product candidates are expensive and time-consuming, and their outcome is uncertain;
- we will need to raise additional capital, which may cause dilution to our stockholders, restrict our operations or require us to relinquish rights to our technologies or product candidates, and additional capital may not be available on favorable terms or at all, which may force us to delay, reduce the scope of or eliminate our research and development programs, reduce our commercialization efforts or curtail our operations;
- we are subject to extensive and costly government regulation;
- even if we obtain regulatory approval to market our product candidates, our product candidates may not be accepted by the market;

- we rely on a license to use the technology that is material to our business and if the agreement underlying the license were to be terminated or if other rights that may be necessary for commercializing our intended products cannot be obtained, it would halt our ability to market our products and technology, as well as have an immediate material adverse effect on our business, operating results and financial condition;
- we are subject to stringent and evolving U.S. and foreign laws, regulations, rules, contractual obligations, policies and other obligations related to data privacy and security. Our actual or perceived failure to comply with such obligations could lead to regulatory investigations or actions, litigation, fines and penalties, disruptions of our business operations, reputational harm, loss of revenue or profits and other adverse business consequences; and
- global and macroeconomic conditions, including worldwide economic, political and social instability could adversely affect our revenue, financial condition, or results of operations.

Risks Related to Our Business

We have a history of operating losses and expect to incur losses for the foreseeable future. We may never generate revenues or, if we are able to generate revenues, achieve profitability.

We are focused on product development, and we have not generated any significant revenues to date. We have incurred losses in each year of our operations, and we expect to continue to incur operating losses for the foreseeable future. These operating losses have adversely affected and are likely to continue to adversely affect our working capital, total assets and shareholders' equity.

We and our prospects should be examined in light of the risks and difficulties frequently encountered by new and early-stage companies in new and rapidly evolving markets. These risks include, among other things, the speed at which we can scale up operations, our complete dependence upon development of our product candidates that currently have no market acceptance, our ability to establish and expand our brand name, our ability to expand our operations to meet the commercial demand of our clients, our development of and reliance on strategic and customer relationships and our ability to minimize fraud and other security risks.

The process of developing our product candidates requires significant time, effort and expenses in preclinical, clinical and regulatory development. In addition, commercialization of our product candidates will require that we obtain necessary regulatory approvals and establish sales, marketing and manufacturing capabilities, either through internal hiring or through contractual relationships with others. We expect to incur substantial additional operating expenses over the next several years as our research, development, preclinical studies and clinical trial activities increase. Product candidates in later stages of clinical development generally incur higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. As a result, we expect that our research and development expenses will continue to increase in the foreseeable future as we (i) increase personnel costs, including stock-based compensation, (ii) continue preclinical development of our lead compounds, (iii) initiate clinical trials for certain product candidates, (iv) continue to discover and develop additional product candidates, and (v) pursue later stages of clinical development of product candidates.

The amount of future losses and when, if ever, we will achieve profitability are uncertain. We have no products that have generated any commercial revenue, do not expect to generate revenues from the commercial sale of products in the foreseeable future, and might never generate revenues from the sale of products. Our ability to generate revenue and achieve profitability will depend on, among other things, successful completion of preclinical development and testing and clinical trials of our product candidates; obtaining necessary regulatory approvals from the FDA; establishing manufacturing, sales and marketing arrangements with third parties; successfully commercializing our products; establishing a favorable competitive position; and raising sufficient funds to finance our activities. Many of these factors will depend on circumstances beyond our control. We might not succeed at any of these undertakings. If we are unsuccessful at some or all of these undertakings, our business, prospects and results of operations may be materially adversely affected.

We have a limited operating history and we expect a number of factors to cause our operating results to fluctuate on a quarterly and annual basis, which may make it difficult to predict our future performance.

We are a preclinical stage biopharmaceutical company with a limited operating history. Our operations to date have been primarily limited to organizing and staffing our company, expanding its operations, performing research, acquiring, developing and securing our in-licensed technology and preclinical development of our product candidates. We have not yet begun or successfully completed any clinical trials, completed Investigational New Drug ("IND") enabling or Good Laboratory Practice ("GLP") compliant studies for any of our product candidates, manufactured our products candidates at clinical or commercial scale or conducted sales and marketing activities that will be necessary to successfully commercialize our product candidates. Consequently, any predictions made about our future success or viability may not be as accurate as they could be if we had a longer operating history or commercialized products. Our financial condition has varied significantly in the past and will continue to fluctuate from quarter-to-quarter or year-to-year due to a variety of factors, many of which are beyond our control. Factors relating to our business that may contribute to these fluctuations include, among other factors described elsewhere in this Annual Report:

- our ability to obtain additional funding to develop our product candidates, the extent to which we are able to obtain such funding on favorable terms, and changes to our operations or strategy that may be necessitated due to the need for additional funding;
- our ability to conduct and complete preclinical studies, including GLP-compliant and IND-enabling preclinical studies;
- delays in the commencement, enrollment and timing of clinical trials;
- the success of our preclinical studies and clinical trials through all phases of development;
- any delays in regulatory review and approval of product candidates in clinical development;
- our ability to obtain and maintain regulatory approval for our product candidates in the United States and foreign jurisdictions;
- our ability to successfully commercialize product candidates for which we obtain regulatory approval, within expected timelines or at all;
- potential toxicity and/or side effects of our product candidates that could delay or prevent commercialization, limit the indications for any approved drug, require the establishment of risk evaluation and mitigation strategies ("REMS"), or cause an approved drug to be taken off the market;
- our ability to establish or maintain collaborations, licensing or other arrangements;
- market acceptance of our product candidates;
- competition from existing products, new products or new therapeutic approaches that may emerge;
- the ability of patients or healthcare providers to obtain coverage of or sufficient reimbursement for our products;
- our ability to leverage our in-licensed technology platform to discover and develop additional product candidates;
- our ability and our licensors' abilities to successfully obtain, maintain, defend and enforce intellectual property rights important to our business;
- the impact of political instability, natural disasters, events of terrorism and wars, including Russia's invasion of Ukraine;

- the impact of other global and macroeconomic conditions, including rising inflation and interest rates, supply chain disruptions, fluctuating exchange rates, and increases in commodity, energy and fuel prices; and

- potential product liability claims.

Accordingly, the results of any quarterly or annual periods should not be relied upon as indications of future operating performance.

Risks Related to Product Development, Regulatory Approval, Manufacturing and Commercialization

We may conduct certain of our clinical trials for our product candidates outside of the U.S. which, among other risks, exposes us to the possibility that the FDA and other foreign equivalents may not accept data from such trials, in which case our development plans will be delayed, which could materially harm our business.

We expect to complete the preclinical development and submit the regulatory dossier to the Human Research Ethics Committee in Australia to initiate a first-in-human Phase 1 clinical trial in our Parkinson's disease program. Although the FDA may accept data from clinical trials conducted outside the U.S., acceptance of this data is subject to certain conditions imposed by the FDA. Where data from foreign clinical trials are intended to serve as the basis for marketing approval in the U.S., the FDA will not approve the application on the basis of foreign data alone unless those data are applicable to the U.S. population and U.S. medical practice; the studies were performed by clinical investigators of recognized competence; and the data are considered valid without the need for an on-site inspection by the FDA or, if the FDA considers such an inspection to be necessary, the FDA is able to validate the data through an on-site inspection or other appropriate means. For studies that are conducted only at sites outside of the U.S. and not subject to an IND, the FDA requires the clinical trial to have been conducted in accordance with GCPs, and the FDA must be able to validate the data from the clinical trial through an on-site inspection if it deems such inspection necessary. For such studies not subject to an IND, the FDA generally does not provide advance comment on the clinical protocols for the studies, and therefore there is an additional potential risk that the FDA could determine that the study design or protocol for a non-U.S. clinical trial was inadequate, which could require us to conduct additional clinical trials. There can be no assurance the FDA will accept data from clinical trials conducted outside of the U.S. If the FDA does not accept data from our clinical trials of our product candidates conducted outside of the U.S., it would likely result in the need for additional clinical trials, which would be costly and time consuming and delay or permanently halt our development of our product candidates.

Conducting clinical trials outside the U.S. also exposes us to additional risks, including risks associated with:

- additional foreign regulatory requirements;

- foreign exchange fluctuations;

- compliance with foreign manufacturing, customs, shipment and storage requirements;

- cultural differences in medical practice and clinical research; and

- diminished protection of intellectual property in some countries.

By extension, clinical trials that are predominantly conducted in the United States or primarily based on feedback from the FDA may not result in sufficiently diverse patient populations to warrant approval in other countries (for example, Japan) or those other health authorities may have differences of opinion on appropriateness of trial design or differences in interpretation of some data. In those situations, approvals in other countries outside the United States may be delayed or never approved, which would materially detract from the commercial success of any impacted product candidates.

If preclinical studies or clinical trials for our product candidates cannot be initiated or completed or if they are delayed or unsuccessful, we will be unable to meet our future development and commercialization goals.

We rely and expect to continue to rely on third parties, including contract research organizations ("CROs") and outside consultants, to conduct, supervise or monitor some or all aspects of preclinical studies and clinical trials

involving our product candidates. We have less control over the timing and other aspects of these preclinical studies and clinical trials than if we performed the monitoring and supervision entirely on our own. Third parties may not perform their responsibilities for our preclinical studies and clinical trials on our anticipated schedule or, for clinical trials, consistent with a clinical trial protocol. Delays in preclinical studies and clinical trials could significantly increase our product development costs and delay product commercialization. In addition, many of the factors that may cause, or lead to, a delay in the clinical trials may also ultimately lead to denial of regulatory approval of a product candidate.

The commencement of clinical trials can be delayed for a variety of reasons, including delays in:

- demonstrating sufficient safety and efficacy to obtain regulatory approval to commence a clinical trial;
- reaching agreement on acceptable terms with prospective CROs and study sites;
- developing a stable formulation of a product candidate;
- manufacturing sufficient quantities of a product candidate; and
- obtaining institutional review board ("IRB") approval to conduct a clinical trial at a prospective site.

Once a clinical trial has begun, it may be delayed, suspended or terminated by us or the FDA or other regulatory authorities due to a number of factors, including:

- ongoing discussions with the FDA or other regulatory authorities regarding the scope or design of our clinical trials;
- failure to conduct clinical trials in accordance with regulatory requirements;
- lower than anticipated recruitment or retention rate of patients in clinical trials;
- inspection of the clinical trial operations or study sites by the FDA or other regulatory authorities resulting in the imposition of a clinical hold;
- lack of adequate funding to continue clinical trials;
- negative results of clinical trials;
- investigational drug product out-of-specification; or
- nonclinical or clinical safety observations, including adverse events and SAEs.

If clinical trials are unsuccessful, and we are not able to obtain regulatory approvals for our product candidates under development, we will not be able to commercialize these products, and therefore may not be able to generate sufficient revenues to support our business.

The disorders we seek to treat have low prevalence and it may be difficult to identify patients with these disorders, which may lead to delays in enrollment for our trials or slower commercial revenue if approved, and we may also face enrollment challenges as a result of other factors.

Genetically defined disorders generally, and especially those for which our current product candidates are targeted, have low incidence and prevalence. We expect to rely in part on relationships with clinical centers of excellence, key opinion leaders and patient advocacy groups to assist in identifying eligible patients, and any deterioration of those relationships could impede our ability to successfully enroll patients. Patient enrollment may be affected by other factors including:

- the severity of the disease under investigation;

- design of the study protocol;
- the eligibility criteria for the trial;
- the perceived risks, benefits and convenience of administration of the product candidate being studied;
- our efforts to facilitate timely enrollment in clinical trials;
- the availability of other clinical trials being conducted for the same indication;
- the patient referral practices of physicians; and
- the proximity and availability of clinical trial sites to prospective patients.

Our inability to enroll a sufficient number of patients with these diseases for our future clinical trials would result in significant delays and could require us to not initiate or to abandon clinical trials for one or more indications altogether. Enrollment delays in our clinical trials may result in increased development costs for our product candidates, which would cause the value of our company to decline and limit our ability to obtain additional financing.

Additionally, the reported number of people in the indication we aim to treat, as well as the people with these diseases who have the potential to benefit from treatment with our product candidates, are based on estimates. The total addressable market opportunity for our product candidates will ultimately depend upon, among other things, the final approved product labeling for each of our product candidates, if our product candidates are approved for sale in our target indications, acceptance by the medical community and patient access, drug pricing and reimbursement. The number of patients globally may turn out to be lower than expected, patients may not be otherwise amenable to treatment with our products, or new patients may become increasingly difficult to identify or gain access to, all of which would adversely affect our results of operations and our business.

Our product candidates are novel and still in development. If we are unable to successfully develop, receive regulatory approval for and commercialize our current or future product candidates, our business will be harmed.

Because the SEE-Tx® platform remains untested and our product candidates are in early stages of development, they will require extensive preclinical and clinical testing. Our product candidates will require significant additional development, preclinical and IND-enabling studies and clinical trials, regulatory clearances and additional investment by us or our collaborators before they can be commercialized. Our drug development methods may not lead to commercially viable drugs for any of several reasons. For example, we may fail to identify appropriate targets or compounds, our product candidates may fail to be safe and effective in clinical trials, or we may have inadequate financial or other resources to pursue development efforts for our product candidates. Also, third parties we rely on for preclinical development, such as the providers of supercomputer time needed for our SEE-Tx® platform and collaborators that provide us with materials and resources may fail to fulfill their obligations to us in a timely manner or at all and the development of our product candidates could be significantly delayed as a result. In addition, we are still developing proof of concept for our product candidates in animals and positive data from animal models may not be predictive of positive human results and patients may have side effects that were not observed in animals.

Further, we and our product candidates are subject to extensive regulation by the FDA and comparable regulatory authorities in other countries governing, among other things, research, testing, clinical trials, manufacturing, labeling, promotion, selling, adverse event reporting and recordkeeping. Obtaining FDA approval is a lengthy, expensive and uncertain process. If required regulatory registrations or approvals are delayed, denied, withdrawn or if the regulatory authorities question the efficacy of our new small molecules as a treatment, such events are likely to have a material adverse effect on our business, results of operations, cash flows, financial condition and/or prospects.

We have not tested any of our product candidates in clinical trials. Success in early preclinical studies or clinical trials may not be indicative of results obtained in later preclinical studies and clinical trials.

We have not tested any of our product candidates in clinical trials. Success in early preclinical studies or any clinical trials we may conduct not be indicative of results obtained in later preclinical studies and clinical trials.

We will be required to demonstrate through adequate and well-controlled clinical trials that our product candidates are safe and effective, with a favorable benefit-risk profile, for use in their target indications before we can seek regulatory approvals for their commercial sale. Trial designs and results from early-phase trials are not necessarily predictive of future clinical trial designs or results, and initial positive results we may observe may not be confirmed in later-phase clinical trials. Our product candidates may also fail to show the desired safety and efficacy in later stages of clinical development even if they successfully advance through initial clinical trials. We may not be able to demonstrate the safety and efficacy of our STAR molecules in our clinical trials. Even if our clinical trials demonstrate acceptable safety and efficacy of STAR molecules for a targeted disease, the labeling we obtain through negotiations with the FDA or foreign regulatory authorities may not include data on secondary endpoints and may not provide us with a competitive advantage over other products approved for the same or similar indications.

Many companies in the biotechnology industry have suffered significant setbacks in late-stage clinical trials after achieving positive results in early-stage development and there is a high failure rate for product candidates proceeding through clinical trials. We may face similar setbacks or failures. Different methodologies, assumptions and applications we utilize to assess particular safety or efficacy parameters may yield different statistical results. Even if we believe the data collected from clinical trials of our product candidates are promising, these data may not be sufficient to support approval by the FDA or foreign regulatory authorities. Preclinical and clinical data can be interpreted in different ways. Accordingly, the FDA or foreign regulatory authorities could interpret these data in different ways from us or our partners, which could delay, limit or prevent regulatory approval. If our study data do not consistently or sufficiently demonstrate the safety or efficacy of any of our product candidates, then the regulatory approvals for such product candidates could be significantly delayed as we work to meet approval requirements, or, if we are not able to meet these requirements, such approvals could be withheld or withdrawn. Regulatory delays or rejections may also be encountered as a result of many other factors, including changes in regulatory policy during the period of product development.

The approach we are taking to discover and develop our product candidates is novel and may never lead to marketable products.

We have concentrated our efforts and research and development activities on our novel small molecules for potential treatment of rare and genetic diseases caused by protein misfolding and SEE-Tx®, our target identification platform. Our future success depends on the successful development of such product candidates, including our ability to successfully complete IND-enabling and GLP-compliant preclinical studies, and the effectiveness of our platform. The scientific discoveries that form the basis for our efforts to discover and develop new drugs are relatively new. The scientific evidence to support the feasibility of developing drugs based on these discoveries is both preliminary and limited. Skepticism as to the feasibility of developing small molecules of this type that can cross the blood-brain barrier generally has been, and may continue to be, expressed in scientific literature. In addition, decisions by other companies with respect to their therapeutic development efforts may increase skepticism in the marketplace regarding the potential for potential therapeutics. There are currently no companies with approved drugs for these indications that have the ability to cross the blood-brain barrier.

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

Because we have limited financial and human resources, we are currently focusing primarily on development of our Parkinson's and Gaucher disease programs. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

Clinical trials required for our product candidates are expensive and time-consuming, and their outcome is uncertain.

To obtain FDA approval to market a new pharmaceutical product, we must demonstrate proof of safety and effectiveness in humans. To meet these requirements, we must conduct "adequate and well controlled" clinical trials. Conducting clinical trials is a lengthy, time-consuming, and expensive process. The length of time may vary substantially according to the type, complexity, novelty, and intended use of the product candidate, and often can be several years or more per study. Delays in clinical trials for our product candidates may cause us to incur additional operating expenses. The commencement and rate of completion of clinical trials may be delayed by many factors, including, for example: inability to manufacture sufficient quantities of stable and qualified materials under current good manufacturing practices ("cGMPs") for use in clinical trials; slower than expected rates of patient recruitment; failure to recruit a sufficient number of patients, which is a common issue in studies for rare disorders such as the indications we are currently pursuing; modification of clinical trial protocols; changes in regulatory requirements for clinical trials; the lack of effectiveness during clinical trials; the emergence of unforeseen safety issues; delays, suspension, or termination of the clinical trials due to the investigatory authority responsible for overseeing the trial at a particular trial site; and government or regulatory delays or "clinical holds" requiring suspension or termination of the studies.

Our clinical trials may be conducted in patients with neurodegenerative diseases, and in some cases, our product candidates are expected to be used in combination with approved therapies that themselves have significant adverse event profiles. During the course of treatment, these patients could suffer adverse medical events or die for reasons that may or may not be related to our product candidates. Any safety issues that arise with respect to our product candidates may delay or prevent clinical development.

The failure of clinical trials to demonstrate safety and effectiveness for the desired indications could harm the development of that product candidate and other product candidates that use a similar therapeutic approach. This failure could cause us to abandon a product candidate and could delay development of other product candidates. Any delay in, or termination of, our clinical trials would delay our ability to obtain regulatory approvals for and commercialize our product candidates and generate product revenues. Any change in, or termination of, our clinical trials could materially harm our business, financial condition and results of operations.

We have limited experience as a company conducting clinical trials and may be unable to complete pivotal clinical trials for any product candidates we may develop.

We are not yet a clinical stage company and our success is dependent upon our ability to initiate and successfully complete clinical trials and obtain regulatory approval for and commercialization of our product candidates. We have not demonstrated an ability to perform the functions necessary for the approval or successful commercialization of any product candidate. The successful commercialization of any product candidate may require us to perform a variety of functions, including:

- continuing to undertake preclinical development;
- obtaining approval to commence clinical trials;
- successfully planning and enrolling subjects in clinical trials;
- participating in regulatory approval processes;
- formulating and manufacturing products; and
- conducting sales and marketing activities.

We have limited experience designing, conducting and enrolling subjects in clinical trials. While certain members of our management and staff have significant experience in conducting clinical trials, to date, we have not successfully begun or completed any clinical trials as a company. Until recently, our operations have been limited primarily to organizing and staffing our company, expanding its operations, performing research, acquiring, developing and securing our in-licensed technology and preclinical development of our product candidates. These operations provide a limited basis to assess our ability to develop and commercialize our product candidates.

Because of this lack of experience, any future clinical trials we may conduct may not be completed on time, if at all. Large-scale trials require significant additional financial and management resources, monitoring and oversight, and reliance on third-party clinical investigators, consultants or contract research organizations ("CROs"). Relying on third-party clinical investigators, CROs and manufacturers, which are all also subject to governmental oversight and regulations, may also cause us to encounter delays that are outside of our control.

In addition, we are still in the drug discovery and preclinical development stage for our product candidates and have not yet begun discussions with the FDA as to the design, structure and number of clinical trials that our product candidates would require for approval. Consequently, we may be unable to successfully and efficiently advance any candidates we select for clinical trials or execute and complete necessary GLP-compliant preclinical and IND-enabling studies in a way that leads to IND submission and approval of any product candidate. We may require more time and incur greater costs than our competitors and may not succeed in obtaining regulatory approvals of any product candidates that we develop. Failure to commence or complete, or delays in, future planned clinical trials, could prevent us from or delay us in commercializing our product candidates.

We are subject to extensive and costly government regulation.

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

Government regulation substantially increases the cost and risk of researching, developing, manufacturing and selling our products. The regulatory review and approval process, which includes preclinical studies and clinical trials of each product candidate, is lengthy, expensive, and uncertain. We or our collaborators must obtain and maintain regulatory authorization to conduct clinical trials. We or our collaborators must obtain regulatory approval for each product we intend to market, and the manufacturing facilities used for the products must be inspected and meet legal requirements. Securing regulatory approval requires the submission of extensive preclinical and clinical data and other supporting information for each proposed therapeutic indication in order to establish the product's safety and efficacy, and in the case of biologics also potency and purity, for each intended use. The development and approval process takes many years, requires substantial resources, and may never lead to the approval of a product.

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

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

If we decide to pursue a Fast Track Designation for some of our product candidates, it may not lead to a faster development or regulatory review or approval process.

We may seek Fast Track Designation for one or more of our product candidates. If a drug is intended for the treatment of a serious or life-threatening condition and the drug demonstrates the potential to address unmet medical

needs for this condition, the product sponsor may apply for FDA Fast Track Designation. The FDA has broad discretion whether or not to grant this designation, so even if we believe a particular product candidate is eligible for this designation, the FDA may decide not to grant it. Even if we do receive Fast Track Designation, we may not experience a faster development process, review or approval compared to conventional FDA procedures. The FDA may withdraw Fast Track Designation if it believes that the designation is no longer supported by data from our clinical development program.

If we decide to seek Orphan Drug Designation for some of our product candidates, we may be unsuccessful or may be unable to maintain the benefits associated with Orphan Drug Designation, including the potential for supplemental market exclusivity.

As part of our business strategy, we may seek Orphan Drug Designation for one or more of our product candidates, and we may be unsuccessful. Regulatory authorities in some jurisdictions, including the United States and Europe, may designate drugs for relatively small patient populations as orphan drugs. Under the Orphan Drug Act, the FDA may designate a drug as an orphan drug if it is a drug intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 in the United States where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the United States. In the United States, Orphan Drug Designation entitles a party to financial incentives such as a tax credit. Opportunities for grant funding toward clinical trial costs may also be available for clinical trials of drugs for rare diseases, regardless of whether the drugs are designated for the orphan use. In addition, if a product that has Orphan Drug Designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications to market the same product for the same indication for seven years, except in limited circumstances.

Even if we obtain Orphan Drug Designation for our product candidates in specific indications, we may not be the first to obtain marketing approval of these product candidates for the orphan-designated indication due to the uncertainties associated with developing pharmaceutical products. If a competitor with a product that is determined by the FDA to be the same as one of our product candidates obtains marketing approval before us for the same indication we are pursuing and obtains orphan drug exclusivity, our product candidate may not be approved until the period of exclusivity ends unless we are able to demonstrate that our product candidate is clinically superior. Even after obtaining approval, we may be limited in our ability to market our product. In addition, exclusive marketing rights in the United States may be limited if we seek approval for an indication broader than the orphan-designated indication or may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition. Further, even if we obtain orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different drugs with different principal molecular structural features can be approved for the same condition. Orphan Drug Designation neither shortens the development time or regulatory review time of a drug nor gives the drug any advantage in the regulatory review or approval process. While we may seek Orphan Drug Designation for our product candidates, we may never receive such designation.

We do not have, and may never obtain, the regulatory approvals we need to market our product candidates.

Following completion of clinical trials, the results are evaluated and, depending on the outcome, an NDA is submitted to the FDA to obtain the FDA's approval of the product and authorization to commence commercial marketing. In responding to an NDA, the FDA may require additional testing or information, may require that the product labeling be modified, may impose post-approval study and other commitments or reporting requirements or other restrictions on product distribution, or may deny the application. The FDA has established performance goals for review of NDAs: six months for priority applications and ten months for standard applications. However, the FDA is not required to complete its review within these time periods. The timing of final review by the FDA and action varies greatly but can take years in some cases and may involve the input of an FDA advisory committee of outside experts. Product sales in the United States may commence only when an NDA is approved.

To date, we have not applied for or received the regulatory approvals required for the commercial sale of any of our products in the United States or in any foreign jurisdiction. None of our product candidates have been determined to be safe and effective, and we have not submitted an IND or an NDA to the FDA or an equivalent application to any foreign regulatory authorities for any of our product candidates.

It is possible that none of our product candidates will be approved for marketing. Failure to obtain regulatory approvals, or delays in obtaining regulatory approvals, may adversely affect the successful commercialization of any drugs or biologics that we or our partners develop, may impose additional costs on us or our collaborators, may diminish any competitive advantages that we or our partners may attain, and/or may adversely affect our receipt of revenues or royalties.

Our product candidates may cause serious adverse events ("SAEs") or undesirable side effects which may delay or prevent marketing approval, or, if approval is received, require them to be taken off the market, require them to include safety warnings or otherwise limit their sales.

SAEs or undesirable side effects from our product candidates could arise either during development or, if approved, after the approved product has been marketed. The results of future clinical trials may show that our product candidates cause SAEs or undesirable side effects, which could interrupt, delay or halt clinical trials, resulting in delay of, or failure to obtain, marketing approval from the FDA and other regulatory authorities.

If any of our product candidates cause SAEs or undesirable side effects or suffer from quality control issues:

- regulatory authorities may impose a clinical hold or REMS, which could result in substantial delays, significantly increase the cost of development, and/or adversely impact our ability to continue development of the product;
- regulatory authorities may require the addition of statements, specific warnings, or contraindications to the product label, or restrict the product's indication to a smaller potential treatment population;
- we may be required to change the way the product is administered or conduct additional clinical trials;
- we may be required to implement a risk minimization action plan, which could result in substantial cost increases and have a negative impact on our ability to commercialize the product;
- we may be required to limit the participants who can receive the product;
- we may be subject to limitations on how we promote the product;
- we may, voluntarily or involuntarily, initiate field alerts for product recall, which may result in shortages;
- sales of the product may decrease significantly;
- regulatory authorities may require us to take our approved product off the market;
- we may be subject to litigation or product liability claims, and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of the affected product or could substantially increase commercialization costs and expenses, which in turn could delay or prevent us from generating significant revenues from the sale of our products.

Even if approved, our products will be subject to extensive post-approval regulation.

Once a product is approved, numerous post-approval requirements apply. Among other things, the holder of an approved NDA is subject to periodic and other monitoring and reporting obligations by the FDA, including obligations to monitor and report adverse events and instances of the failure of a product to meet the specifications in the NDA. Application holders must submit new or supplemental applications and obtain the FDA's approval for certain changes to the approved product, product labeling, or manufacturing process. Application holders must also submit advertising and other promotional material to the FDA and report on ongoing clinical trials.

Depending on the circumstances, failure to meet these post-approval requirements can result in criminal prosecution, fines, injunctions, recall or seizure of products, total or partial suspension of production, denial or withdrawal of pre-marketing product approvals or refusal to allow us to enter into supply contracts, including government contracts. In addition, even if we comply with the FDA's and others' requirements, new information regarding the safety or effectiveness of a product could lead the FDA to modify or withdraw product approval.

Even if we obtain regulatory approval to market our product candidates, our product candidates may not be accepted by the market.

Even if the FDA approves one or more of our product candidates, physicians and patients may not accept it or use it. Even if physicians and patients would like to use our products, our products may not gain market acceptance among healthcare payors such as managed care formularies, insurance companies or government programs such as Medicare or Medicaid. Acceptance and use of our products will depend upon a number of factors including: perceptions by members of the health care community, including physicians, about the safety and effectiveness of our drug or device product; cost-effectiveness of our product relative to competing products; availability of reimbursement for our product from government or other healthcare payors; and effectiveness of marketing and distribution efforts by us and our licensees and distributors, if any.

The degree of market acceptance of any pharmaceutical product that we develop will depend on a number of factors, including:

- cost-effectiveness;
- the safety and effectiveness of our products, including any significant potential side effects (including drowsiness and dry mouth), as compared to alternative products or treatment methods;
- the timing of market entry as compared to competitive products;
- the rate of adoption of our products by doctors and nurses;
- product labeling or product insert required by the FDA for each of our products;
- reimbursement policies of government and third-party payors, and the willingness of patients to pay out of pocket in the absence of adequate third-party payor coverage and reimbursement;
- effectiveness of our sales, marketing and distribution capabilities and the effectiveness of such capabilities of our collaborative partners, if any; and
- unfavorable publicity concerning our products or any similar products.

Because we expect sales of our current product candidates, if approved, to generate substantially all of our product revenues for the foreseeable future, the failure of these products to find market acceptance would harm our business and require us to seek additional financing, which may not be available.

Risks Related to Our Financial Condition and Capital Requirements; Competition

We will need to raise additional capital, which may cause dilution to our stockholders, restrict our operations or require us to relinquish rights to our technologies or product candidates, and additional capital may not be available on favorable terms or at all, which may force us to delay, reduce the scope of or eliminate our research and development programs, reduce our commercialization efforts or curtail our operations.

To develop and bring our product candidates to market, we must commit substantial resources to costly and time-consuming research, preclinical studies and clinical trials and marketing activities. Until such time, if ever, as we can generate substantial product revenue, we expect to seek additional funding to meet our operational needs and capital requirements. While we believe that our existing cash, cash equivalents and marketable securities will enable us to fund our operating expenses and capital expenditure requirements into the second quarter of 2024, we have based this estimate on assumptions that may prove to be wrong, and we could exhaust our available capital resources sooner

than we expect, including if our business or operations change in a manner that consumes available resources more rapidly than we anticipate. Our requirements for additional capital will depend on many factors, including:

- the time and expense for preclinical studies and clinical trials for our product candidates;
- the time and costs involved in obtaining regulatory approval for our product candidates;
- the cost increases and other potential impacts of macroeconomic factors, including heightened inflation and rising interest rates, exchange rate fluctuations, supply chain disruptions and increases in commodity, energy and fuel prices;
- costs associated with protecting our intellectual property rights;
- successful commercialization of our product candidates;
- development of marketing and sales capabilities;
- payments received under current and future collaboration agreements, if any; and
- market acceptance of our products.

We expect to finance our operations through a combination of equity offerings, debt financings, government or private party grants, collaborations, strategic alliances and licensing arrangements. We do not currently have any other committed external sources of funds. To the extent we raise additional capital through the sale of equity or convertible debt securities, our stockholders' ownership interest will or could be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights as a common stockholder. In addition, if we obtain debt financing, a substantial portion of our operating cash flow may be dedicated to the payment of principal and interest on such indebtedness, thus limiting funds available for our business activities. In addition, debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may be required to relinquish valuable rights to our technologies, future revenue streams or product candidates, grant licenses on terms that may not be favorable to us or commit to future payment streams.

We will require substantial additional funds to support our research and development activities, and the anticipated costs of preclinical studies and clinical trials, regulatory approvals and eventual commercialization. Such additional sources of financing may not be available on favorable terms, if at all, including as a result of actions taken by central banks to counter inflation, volatility in the capital markets and related market uncertainty. If we do not succeed in raising additional funds on acceptable terms, we may be unable to commence or complete clinical trials or obtain approval of any product candidates from the FDA and other regulatory authorities. In addition, we could be forced to discontinue product development, forego sales and marketing efforts and forego attractive business opportunities.

Our continued operations may be in jeopardy and we may be forced to cease operations and sell or otherwise transfer all or substantially all of our remaining assets.

We face intense competition in the markets targeted by our product candidates. Many of our competitors have substantially greater resources than we do, and we expect that all of our product candidates under development will face intense competition from existing or future drugs.

We expect that all of our product candidates under development, if approved, will face intense competition from existing and future drugs marketed by large companies. These competitors may successfully market products that compete with our products, successfully identify product candidates or develop products earlier than we do, or develop products that are more effective, have fewer side effects or cost less than our products.

Additionally, if a competitor receives FDA approval before we do for a drug that is similar to one of our product candidates, FDA approval for our product candidate may be precluded or delayed due to periods of non-patent

exclusivity and/or the listing with the FDA by the competitor of patents covering its newly-approved drug product. Periods of non-patent exclusivity for new versions of existing drugs can extend up to three and one-half years.

These competitive factors could require us to conduct substantial new research and development activities to establish new product targets, which would be costly and time consuming. These activities would adversely affect our ability to commercialize products and achieve revenue and profits.

Competition and technological change may make our product candidates and technologies less attractive or obsolete.

We compete with companies that are pursuing other forms of treatment for the same or similar indications we are pursuing, including established pharmaceutical and biotechnology companies and that have greater financial and other resources. While we are not currently aware of any other companies that are taking the same therapeutic approach to protein folding disorders similar to the ones we are pursuing, we are aware of companies developing products for the same target indications. Mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated among a smaller number of competitors.

Other companies may succeed in developing products earlier than us, obtaining FDA approval for products more rapidly, or developing products that are more effective than our product candidates. Research and development by others may render our technology or product candidates obsolete or noncompetitive, or result in treatments or cures superior to any therapy we develop. For example, other companies may succeed in developing a technology that addresses protein misfolding and proves to be more effective or is more readily accepted than STARs. We face competition from companies that internally develop competing technology or acquire competing technology from universities and other research institutions. As these companies develop their technologies, they may develop competitive positions that may prevent, make futile, or limit our product commercialization efforts, which would result in a decrease in the revenue we would be able to derive from the sale of any products.

We may not be able to obtain marketplace acceptance for any of our product candidates as readily as these or other competing treatments. Furthermore, if our competitors' products are approved before ours, it could be more difficult for us to obtain approval from the FDA, and if they are commercialized before ours they may establish a strong market position before we are able to enter the market. Even if our products are successfully developed and approved for use by all governing regulatory bodies, physicians and patients may not accept our products as a treatment of choice.

The pharmaceutical research industry is diverse, complex, and rapidly changing, and inherently involves significant and numerous business risks. The effects of competition, intellectual property disputes, market acceptance, and FDA regulations, among other factors described herein, preclude us from forecasting revenues or income with certainty or even confidence.

Our business and operations may be adversely affected by health epidemics or pandemics.

Our business and operations may be adversely affected by pandemics or epidemics, including due to business interruptions caused by travel restrictions, quarantines, "stay-at-home" and "shelter-in-place" orders, shutdowns requested or mandated by governmental authorities, or staffing shortages while employees quarantine as a result of exposure to or transmission of the virus.

Previously, the COVID-19 pandemic resulted in the declaration of a global pandemic and adversely affected economic activity across virtually all sectors and industries on a local, national, and global scale. It resulted in travel and other restrictions in order to reduce the spread of the disease, including government-imposed prohibitions on non-essential operations at physical locations, gatherings and events and travel. As a result of such restrictions, we had implemented a work-from-home policy allowing employees who can work from home to do so. Following the lifting of pandemic-era restrictions, we have transitioned to a hybrid work schedule of in-office work and at-home work consistent with business needs and job requirements. Business travel was previously suspended but is now reduced compared to pre-pandemic levels as online and teleconference technology has been adopted and continues to be used regularly. In addition, COVID-19 restrictions impacted our third-party manufacturers, including one in China, and has previously disrupted, and may in the future disrupt, our ability to obtain manufacturing services.While restrictions have been lifted in places where we operate, future similar government orders or other restrictions on the conduct of business operations and travel related to the COVID-19 pandemic may negatively impact productivity and may disrupt

our ongoing and planned research and development activities. Furthermore, the COVID-19 pandemic has caused a broad negative impact globally on capital markets and economies worldwide.

The COVID-19 pandemic continues to evolve, and the extent to which it may impact our business is uncertain and difficult to predict. The magnitude of the negative effects of COVID-19 will depend, in part, on the length and severity of any restrictions imposed, as well as on the emergence, infectiousness and severity of new variants. New health epidemics or pandemics may emerge that result in similar or more severe disruptions to our business.

Risks Related to Our Intellectual Property

We rely on a license to use the technology that is material to our business and if the agreements underlying the licenses were to be terminated or if other rights that may be necessary for commercializing our intended products cannot be obtained, it would halt our ability to market our products and technology, as well as have an immediate material adverse effect on our business, operating results and financial condition.

We are significantly dependent upon our license with Minoryx Therapeutics S.L. (the "Minoryx License"), as described in the section "Business- Strategic Collaboration and Licensing Arrangements- Minoryx Therapeutics, S.L." in our Annual Report. The Minoryx License grants us exclusive, worldwide rights to certain patents and related intellectual property. If we breach the terms of the Minoryx License, for example, by failing to comply with any material terms thereof, Minoryx may have the right to terminate the license. If we were to lose our license under this agreement, we would not be able to market certain of our products and technology, which would likely require us to cease our current operations and have an immediate material adverse effect on our business, operating results and financial condition.

Our success depends substantially upon our ability to obtain and maintain intellectual property protection relating to our products and technologies.

We are currently seeking patent protection for numerous compounds and methods of treating diseases. There is no assurance that these patents will be issued, and no assurance that, if they do issue, they will prevent other companies from competing with us. Our ability to obtain and enforce patents that may issue from any pending or future patent applications is uncertain and involves complex legal, scientific and factual questions. Thus, we cannot be sure that any patents will issue from any pending or future patent applications owned by or licensed to us. Even if patents do issue, we cannot be sure that the claims of these patents will be held valid or enforceable by a court of law, will provide us with any significant protection against competing products, or will afford us a commercial advantage over competitive products. If, at some point in the future, one or more products resulting from our product candidates is approved for sale by the FDA and we do not have adequate intellectual property protection for those products, competitors could duplicate them for approval and sale in the United States without repeating the extensive testing required of us to obtain FDA approval.

If we fail to protect our intellectual property rights, our ability to pursue the development of our technologies and products would be negatively affected.

Our success will depend in part on our ability to obtain, maintain and protect intellectual property rights related to our product candidates. If we do not adequately maintain or protect our intellectual property, competitors may be able to use our technologies to produce and market drugs in direct competition with us and erode our competitive advantage. Furthermore, some foreign countries lack rules and methods for defending intellectual property rights and do not protect proprietary rights to the same extent as the United States. Many companies have had difficulty protecting their proprietary rights in these foreign countries. For example, the legal systems in India, China and certain other developing countries do not favor the enforcement of patents and other intellectual property rights. We may not be able to prevent misappropriation of our proprietary rights and intellectual property rights in these and other countries.

In addition, the patent process is subject to numerous risks and uncertainties, and we may not be successful in protecting our products by obtaining and defending patents related to them. These risks and uncertainties include the following: patents that may be issued or licensed may be challenged, invalidated, or circumvented, or otherwise may not provide us any competitive advantage; our competitors, many of which have substantially greater resources than we and many of which have made significant investments in competing technologies, may seek, or may already have obtained, patents that will limit, interfere with, or eliminate our ability to make, use, and sell our potential

products either in the United States or in international markets; there may be significant pressure on the United States government and other international governmental bodies to limit the scope of patent protection both inside and outside the United States for treatments that prove successful as a matter of public policy regarding worldwide health concerns; and countries other than the United States may have less robust patent laws than those upheld by United States courts, allowing foreign competitors the ability to exploit these laws to create, develop, and market competing products using our technologies and patents.

Moreover, any patents issued to us may not provide us with meaningful protection, or others may challenge, circumvent or narrow our patents. Third parties may also independently develop products similar to our products, duplicate our unpatented products or design around any patents or proprietary technologies on products we develop. Additionally, extensive time is required for development, testing and regulatory review of a potential product. While extensions of patent terms due to regulatory delays may be available, it is possible that, before any of our product candidates can be commercialized, any related patent, even with an extension, may expire or remain in force for only a short period following commercialization, thereby reducing any advantages to us of the patent.

In addition, the PTO and patent offices in other jurisdictions have often required that patent applications concerning pharmaceutical and/or biotechnology-related inventions be limited or narrowed substantially to cover only the innovations specifically exemplified in the patent application, thereby limiting the scope of protection against competitive challenges. Thus, even if we or our licensors are able to obtain patents, the patents may be substantially narrower than anticipated, which could deprive us of rights necessary for the successful commercialization of our product candidates.

Our success depends on our patents and patent applications that may be licensed exclusively to us and other patents and patent applications to which we may obtain assignment or licenses. We may not be aware, however, of all patents, published applications or published literature that may affect our business either by blocking our ability to commercialize our product candidates, by preventing the patentability of our product candidates by us or our licensors, or by covering the same or similar technologies. These patents, patent applications, and published literature may limit the scope of our future patent claims or adversely affect our ability to market our product candidates. We have not conducted any formal search of patents issued to third parties, and third-party patents containing claims covering our product candidates that predate our patents may exist. Because of the number of patents issued and patent applications filed in our technical areas or fields, our competitors or other third parties may assert that our product candidates are covered by United States or foreign patents held by them.

In addition to patents, we rely on a combination of trade secrets, confidentiality, nondisclosure and other contractual provisions, and security measures to protect our confidential and proprietary information. These measures may not adequately protect our trade secrets or other proprietary information. If they do not adequately protect our rights, third parties could use our technology, and we could lose any competitive advantage we may have. In addition, others may independently develop similar proprietary information or techniques or otherwise gain access to our trade secrets, which could impair any competitive advantage we may have.

Patent protection and other intellectual property protection is crucial to the success of our business and prospects, and there is a substantial risk that such protections will prove inadequate.

We may be involved in lawsuits to protect or enforce our patents, which could be expensive and time consuming.

The pharmaceutical industry has been characterized by extensive litigation regarding patents and other intellectual property rights, and companies have employed intellectual property litigation to gain a competitive advantage. We may become subject to infringement claims or litigation arising out of present and future patents and other proceedings of our competitors. The defense and prosecution of intellectual property suits are costly and time-consuming to pursue, divert the attention of our management and scientific personnel, and their outcome is uncertain. Litigation may be necessary to determine the enforceability, scope, and validity of the proprietary rights of others. An adverse determination in litigation to which we may become a party could subject us to significant liabilities, require us to obtain licenses from third parties, or restrict or prevent us from selling our products in certain markets. Although patent and intellectual property disputes might be settled through licensing or similar arrangements, the costs associated with such arrangements may be substantial and could include our paying large, fixed payments and ongoing royalties. Furthermore, the necessary licenses may not be available on satisfactory terms or at all.

Competitors may infringe our patents, and we may file infringement claims to counter infringement or unauthorized use. Third parties may assert that our patents are invalid and/or unenforceable in these proceedings. Such litigation can be expensive, particularly for a company of our size, and time-consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours is not valid or is unenforceable or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover its technology. An adverse determination of any litigation or defense proceeding could put one or more of our patents at risk of being invalidated or interpreted narrowly.

Third parties may also assert that our patents are invalid in patent office administrative proceedings. These proceedings include oppositions in the European Patent Office and *inter partes* review and post-grant review proceedings in the PTO. The success rate of these administrative challenges to patent validity in the United States is higher than it is for validity challenges in litigation.

Interference or derivation proceedings brought before the PTO may be necessary to determine priority of inventions disclosed in our patents or patent applications. Determining whether a product infringes a patent, as well as priority of inventions and other patent-related disputes, involves complex legal and factual issues and the outcome is often uncertain. During these proceedings, it may be determined that we do not have priority of invention for one or more aspects in our patents or patent applications and could result in the invalidation in part or whole of a patent or could put a patent application at risk of not issuing. Even if successful, an interference or derivation proceeding may result in substantial costs and distraction to our management.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation or interference or derivation proceedings, there is a risk that some of our confidential information could be compromised by disclosure. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments. If investors or securities analysts perceive these results to be negative, the price of our common stock could be adversely affected.

Also, a third party may assert that our patents are invalid or unenforceable. There are not currently any unresolved communications, allegations, complaints or threats of litigation that claim our patents are invalid or unenforceable. Any litigation or claims against us, whether or not merited, may result in substantial costs, place a significant strain on our financial resources, divert the attention of management and harm our reputation. An adverse decision in litigation or administrative proceedings could result in inadequate protection for our product candidates and/or reduce the value of any license agreements we have with third parties.

If we infringe the rights of third parties, we could be prevented from selling products or forced to pay damages and defend against litigation.

If our products, methods, processes and other technologies infringe the proprietary rights of other parties, we could incur substantial costs and we may have to: obtain licenses, which may not be available on commercially reasonable terms or at all; abandon an infringing product candidate; redesign our products or processes to avoid infringement; stop using the subject matter claimed in the patents held by others; pay damages; and/or defend litigation or administrative proceedings which may be costly whether we win or lose, and which could result in a substantial diversion of our financial and management resources.

In addition, because patent applications can take many years to issue and because publication schedules for pending applications vary by jurisdiction, there may be applications now pending of which we are unaware, and which may result in issued patents that our future products would infringe. Also, because the claims of published patent applications can change between publication and patent grant, there may be published patent applications that may ultimately issue with claims that we infringe.

We have licensed all of the rights, assets and technology related to the SEE-Tx® platform from Minoryx and we believe that they owned all of such rights prior to our license. Although, to our knowledge, no third party has asserted a claim of infringement or other claim against us, others may hold or claim to hold proprietary or other rights that could prevent our SEE-Tx® platform from being developed or marketed. Any legal action against us claiming damages and seeking to enjoin commercial activities relating to our SEE-Tx® platform or our processes could subject us to potential liability for damages and require us to obtain a license to continue to manufacture or market any future product candidates based upon the SEE-Tx® platform. We may not prevail in any such actions and any license required under any of these patents may not be made available on commercially acceptable terms, if at all. In addition,

we may not be able to redesign any future product candidates or processes to avoid infringement, if necessary. Accordingly, an adverse determination in a judicial or administrative proceeding, or the failure to obtain necessary licenses, could prevent us from developing and commercializing our future product candidates, which could harm our business, financial condition and operating results.

Risks Related to Third Parties and Collaborators

We intend to rely on third parties to conduct, supervise and monitor our clinical trials, and if those third parties perform in an unsatisfactory manner, it may harm our business.

We expect to rely on CROs and clinical trial sites to ensure the proper and timely conduct of our clinical trials. While we will have agreements governing their activities, we will have limited influence over their actual performance. We will control only certain aspects of our CROs' activities. Nevertheless, we will be responsible for ensuring that our clinical trials are conducted in accordance with the applicable protocol and legal, regulatory and scientific standards, and our reliance on the CROs will not relieve us of our regulatory responsibilities.

We and our CROs are required to comply with the FDA's Good Clinical Practices ("GCPs") for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of clinical trial participants are protected. The FDA enforces these GCPs through periodic inspections of study sponsors, principal investigators and clinical trial sites. If we or our CROs fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA may require us to perform additional clinical trials before approving any marketing applications. Upon inspection, the FDA may determine that our clinical trials did not comply with GCPs. In addition, our clinical trials will require enrollment and participation of a sufficiently large number of patients to evaluate the effectiveness and safety of our product candidates. Accordingly, if our CROs fail to comply with these regulations or fail to recruit a sufficient number of participants, our clinical trials may be delayed or we may be required to repeat such clinical trials, which would delay the regulatory approval process.

Our CROs are not our employees, and we are not able to control whether or not they devote sufficient time and resources to our clinical trials. These CROs may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials, or other drug development activities which could harm our competitive position.

If our CROs do not successfully carry out their contractual duties or obligations, fail to meet expected deadlines, or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols or regulatory requirements, or for any other reasons, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval for, or successfully commercialize our product candidates. As a result, our financial results and the commercial prospects for such product candidates would be harmed, our costs could increase, and our ability to generate revenues could be delayed.

We intend to rely on third parties to manufacture the compounds used in our studies, and we intend to rely on them for the manufacture of any approved products for commercial sale. If these third parties do not manufacture our product candidates in sufficient quantities and at an acceptable cost, clinical development and commercialization of our product candidates could be delayed, prevented or impaired.

We have no manufacturing facilities and we intend to rely on third-party contract manufacturing organizations ("CMOs") to manufacture some or all of our product candidates in future clinical trials and our products that reach commercialization. Initiation and completion of our clinical trials and commercialization of our product candidates requires the manufacture of a sufficient supply of our product candidates. If, for any reason, we become unable to rely on these third parties for the manufacture of our product candidates, either for clinical trials or, in the event any of our product candidates are approved, for commercial quantities, then we would need to identify and contract with additional or replacement third-party manufacturers to manufacture compounds for preclinical, clinical and commercial purposes, which we may not be able to do on reasonable terms or at all, or we may be forced to manufacture the materials ourselves, for which we may not have the capabilities or resources. In either scenario, our clinical trials supply could be delayed significantly as we establish alternative supply sources. In some cases, the technical skills required to manufacture our products or product candidates may be unique or proprietary to the original CMO and we may have difficulty, or there may be contractual restrictions prohibiting us from, transferring such skills to a back-up or alternate supplier, or we may be unable to transfer such skills at all. In addition, if we are required to

change CMOs for any reason, we will be required to verify that the new CMO maintains facilities and procedures that comply with quality standards and with all applicable regulations.

We will also need to verify, such as through a manufacturing comparability study, that any new manufacturing process will produce our product candidates according to any specifications previously submitted to the FDA or another regulatory authority. The delays associated with the verification of a new CMO could negatively affect our ability to develop product candidates or commercialize our products in a timely manner or within budget. Furthermore, a CMO may possess technology related to the manufacture of our product candidate that such CMO owns independently. This would increase our reliance on such CMO or require us to obtain a license from such CMO in order to have another CMO manufacture our product candidates. In addition, changes in manufacturers often involve changes in manufacturing procedures and processes, which could require that we conduct bridging studies between our prior clinical supply used in our clinical trials and that of any new manufacturer. We may be unsuccessful in demonstrating the comparability of clinical supplies which could require the conduct of additional clinical trials.

We believe that there are a variety of manufacturers that we may be able to retain to produce these products. However, we may be in competition with other companies for access to these manufacturers' facilities and may be subject to delays in manufacture if the manufacturers give other clients higher priority than they give to us. If we are unable to secure and maintain third-party manufacturing capacity, the development and sales of our products and our financial performance may be materially affected. In addition, once we retain a manufacturing source, if our manufacturers do not perform in a satisfactory manner, we may not be able to develop or commercialize potential products as planned. Certain specialized manufacturers are expected to provide us with modified and unmodified pharmaceutical compounds, including finished products, for use in our preclinical studies and clinical trials. Some of these materials are available from only one supplier or vendor. Any interruption in or termination of service by such sole source suppliers could result in a delay or interruption in manufacturing until we locate an alternative source of supply. Any delay or interruption in our future supply chain and manufacturing operations (or failure to locate a suitable replacement for such suppliers) as a result of pandemics or epidemics, global geopolitical conflicts or broader global supply chain disruptions, may affect their ability to deliver products to us in a timely manner and, could materially adversely affect our business, prospects, or results of operations. For example, supply chain issues have occurred and may continue to occur as a result of the COVID-19 pandemic, the war between Ukraine and Russia and sanctions resulting therefrom, and global geopolitical tension, including as a result of impacts on energy availability and prices and natural materials availability and prices. We also have a third-party manufacturer in China, which may be impacted by heightened tensions between the United States and China. If we fail to contract for manufacturing on acceptable terms or if third-party manufacturers do not perform as we expect, our development programs could be materially adversely affected. This may result in delays in filing for and receiving FDA approval for one or more of our products or prevent such approval entirely. Any such delays or failures to obtain regulatory approval could cause our prospects to suffer significantly.

Failure by our third-party manufacturers to comply with the regulatory guidelines set forth by the FDA with respect to our product candidates could delay or prevent the completion of clinical trials, the approval of any product candidates or the commercialization of our products.

Third-party manufacturers must be inspected by the FDA for cGMP compliance before they can produce commercial products.

We may be in competition with other companies for access to these manufacturers' facilities and may be subject to delays in manufacture if the manufacturers give other clients higher priority than they give to us. If we are unable to secure and maintain third-party manufacturing capacity, the development and sales of our products and our financial performance may be materially affected.

Manufacturers are obligated to operate in accordance with FDA-mandated requirements. A failure of any of our third-party manufacturers to establish and follow cGMP requirements and to document their adherence to such practices may lead to significant delays in the availability of material for clinical trials, may delay or prevent filing or approval of marketing applications for our products, and may cause delays or interruptions in the availability of our products for commercial distribution following FDA approval. This could result in higher costs to us or deprive us of potential product revenues.

Drug manufacturers are subject to ongoing periodic unannounced inspections by the FDA, the Drug Enforcement Administration ("DEA") and corresponding state and foreign agencies to ensure strict compliance with

cGMP requirements and other requirements under federal drug laws, other government regulations and corresponding foreign standards. If we or our third-party manufacturers fail to comply with applicable regulations, sanctions could be imposed on us, including fines, injunctions, civil penalties, failure by the government to grant marketing approval of drugs, delays, suspension or withdrawal of approvals, seizures or recalls of product, operating restrictions and criminal prosecutions.

Corporate and academic collaborators may take actions to delay, prevent, or undermine the success of our products.

Our operating and financial strategy for the development, clinical testing, manufacture, and commercialization of product candidates is heavily dependent on our entering into collaborations with corporations, academic institutions, licensors, licensees, and other parties and we may not be successful in establishing such collaborations. Some of our existing collaborations are, and future collaborations may be, terminable at the sole discretion of the collaborator. Replacement collaborators might not be available on attractive terms, or at all. The activities of any collaborator will not be within our control and may not be within our power to influence. Any collaborators may not perform their obligations to our satisfaction, or at all, we may not derive any revenue or profits from such collaborations, and any collaborators may ultimately compete with us. If any collaboration is not pursued, we may require substantially greater capital to undertake development and marketing of our proposed products and may not be able to develop and market such products effectively, if at all. In addition, a lack of development and marketing collaborations may lead to significant delays in introducing proposed products into certain markets and/or reduced sales of proposed products in such markets.

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

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

If we fail to establish marketing, sales and distribution capabilities, or fail to enter into arrangements with third parties, we will not be able to create a market for our product candidates.

Our strategy for our product candidates is to control, directly or through contracted third parties, all or most aspects of the product development process, including marketing, sales and distribution. Currently, we do not have any sales, marketing or distribution capabilities. In order to generate sales of any product candidates that receive regulatory approval, we must either acquire or develop an internal marketing and sales force with technical expertise and with supporting distribution capabilities or make arrangements with third parties to perform these services for us. The acquisition or development of a sales and distribution infrastructure would require substantial resources, which may divert the attention of our management and key personnel and defer our product development efforts.

To the extent that we enter into marketing and sales arrangements with other companies, our revenues will depend on the efforts of others. These efforts may not be successful. If we fail to develop sales, marketing and distribution channels, or enter into arrangements with third parties, we will experience delays in product sales and incur increased costs.

Sales of pharmaceutical products largely depend on the reimbursement of patients' medical expenses by government health care programs and private health insurers. Without the financial support of the government or third-party payors, the market for our products will be limited. These third-party payors are increasingly challenging the price and examining the cost effectiveness of medical products and services. Recent proposals to change the health care system in the United States have included measures that would limit or eliminate payments for medical products and services or subject the pricing of medical treatment products to government control. Significant uncertainty exists as to the reimbursement status of newly approved health care products. Third-party payors may not reimburse sales of our products or enable our collaborators to sell them at profitable prices.

Our business strategy might involve out-licensing product candidates to or collaborating with larger firms with experience in marketing and selling pharmaceutical products. We may not be able to successfully establish marketing, sales, or distribution relationships and such relationships, if established, may not be successful. Further, we may not be successful in gaining market acceptance for our products. To the extent that we enter into any marketing, sales, or distribution arrangements with third parties, our product revenues will be lower than if we marketed and sold

our products directly, and any revenues we receive will depend upon the efforts of such third-parties. If we are unable to establish such third-party sales and marketing relationships, or choose not to do so, we will have to establish and rely on our own in-house capabilities.

We, as a company, have no experience in marketing or selling pharmaceutical products and currently have no sales, marketing, or distribution infrastructure. To market any of our products directly, we would need to develop a marketing, sales, and distribution force that both has technical expertise and the ability to support a distribution capability. The establishment of a marketing, sales, and distribution capability would significantly increase our costs, possibly requiring substantial additional capital. In addition, there is intense competition for proficient sales and marketing personnel, and we may not be able to attract individuals who have the qualifications necessary to market, sell, and distribute our products. We may not be able to establish internal marketing, sales, or distribution capabilities. If we are unable to, or choose not to establish these capabilities, or if the capabilities we establish are not sufficient to meet our needs, we will be required to establish collaborative marketing, sales, or distribution relationships with third parties.

If any of our existing or future collaborative partners do not satisfy their obligations, or if we are unable to enter into collaboration agreements with partners on favorable terms, we will be unable to develop our partnered product candidates.

We may not have day-to-day control over the activities of our existing and future collaborative partners with respect to any of our partnered product candidates. Any collaborative partner may not fulfill its obligations under our collaboration agreements. If a collaborative partner fails to fulfill its obligations under an agreement with us, we may be unable to assume the development of the products covered by that agreement or enter into alternative arrangements with a third party. In addition, we may encounter delays in the commercialization of the product candidate that is the subject of the agreement. Accordingly, our ability to receive any revenue from the product candidates covered by these agreements will be dependent on the efforts of our collaborative partner. We could also become involved in disputes with a collaborative partner, which could lead to delays in or termination of our development and commercialization programs and time-consuming and expensive litigation or arbitration. In addition, any such dispute could diminish our collaborators' commitment to us and reduce the resources they devote to developing and commercializing our products. Conflicts or disputes with our collaborators, and competition from them, could harm our relationships with our other collaborators, restrict our ability to enter future collaboration agreements and delay the research, development or commercialization of our product candidates. If any collaborative partner terminates or breaches its agreement, or otherwise fails to complete its obligations in a timely manner, our chances of successfully developing or commercializing these product candidates would be materially and adversely affected. We may not be able to enter into collaboration agreements with partners on terms favorable to us, or at all. Our inability to enter into collaborative arrangements with collaborative partners, or our failure to maintain such arrangements, would limit the number of product candidates that we could develop and ultimately decrease our sources of any future revenues.

We face risks in connection with existing and future collaborations with respect to the development, manufacture and commercialization of our product candidates.

We face a number of risks in connection with our current and future collaborations. Our collaboration agreements are subject to termination under various circumstances. Our collaborators may change the focus of their development and commercialization efforts or may have insufficient resources to effectively assist in the development of our products. Any future collaboration agreements may have the effect of limiting the areas of research and development that we may pursue, either alone or in collaboration with third parties. Further, disagreements with collaborators, including disagreements over proprietary rights, contract interpretation, or the preferred course of development, might cause delays, might result in litigation or arbitration, or might result in termination of the research, development or commercialization of our products. Any such disagreements would divert management attention and resources and be time-consuming and costly.

General Risk Factors

We previously identified material weaknesses in our internal control over financial reporting and may identify additional material weaknesses in the future or otherwise fail to maintain an effective system of internal controls, which may result in material misstatements of our financial statements or cause us to fail to meet our periodic reporting obligations.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rule 13a-15(f) under the Exchange Act. In addition, Section 404 of the Sarbanes-Oxley Act of 2002 (Section 404) and related SEC rules require management to furnish a report on the effectiveness of our internal control over financial reporting. Effective internal controls are necessary for us to provide reliable financial reports and help us to prevent fraud. The process of implementing our internal controls and complying with Section 404 is expensive and time consuming and requires significant continuous attention of management. We cannot be certain that these measures will ensure that we maintain adequate controls over our financial processes and reporting in the future.

For example, in our IPO, we previously disclosed material weaknesses relating to the following: (1) lack of sufficient accounting and supervisory personnel who have the appropriate level of technical accounting experience and training, and (2) lack of adequate procedures and controls to ensure that accurate financial statements can be prepared and reviewed on a timely basis, which we remediated as of December 31, 2021 and December 31, 2022, respectively.

While we believe the remediation efforts both addressed the identified material weaknesses and also enhanced our overall financial control environment, if we fail to maintain the adequacy of our internal controls, including any failure to implement new or improved controls, or if we experience difficulties in their implementation, our business and financial results could be harmed and we would be required to disclose material weaknesses in future filings with the SEC, which could adversely affect our business, investor confidence in our company and the market price of our common stock and could subject us to litigation or regulatory enforcement actions. As a result, shareholders could lose confidence in our financial and other public reporting, which would harm our business and the market value of our common stock.

Global and macroeconomic conditions, including economic, political and social instability could adversely affect our revenue, financial condition, or results of operations.

The global credit and financial markets have recently experienced extreme volatility and disruptions, including severely diminished liquidity and credit availability, disruptions in access to bank deposits and lending commitments due to bank failures, declines in economic growth, increases in unemployment rates, supply chain disruptions, rising interest rates, stock volatility and record inflation, as well as uncertainty about economic stability. Such conditions may continue or worsen in the future. The financial markets and the global economy may also be adversely affected by the current or anticipated impact of military conflict, including Russia's invasion of Ukraine, terrorism, or other geopolitical events. Sanctions imposed by the United States and other countries in response to such conflicts, including the one in Ukraine, may also adversely impact the financial markets and the global economy, and any economic countermeasures by affected countries and others could exacerbate market and economic instability. There can be no assurance that further deterioration in credit and financial markets and confidence in economic conditions will not occur.

Our general business strategy, as well as our suppliers' ability to provide us with raw materials and components, may be adversely affected by any such economic downturn, volatile business environment or continued unpredictable and unstable market conditions, which could directly affect our ability to attain our operating goals on schedule and on budget, including requiring us to delay or abandon certain development plans, and could have a material adverse effect on our growth strategy, financial performance and stock price. In addition, there is a risk that one or more of our current suppliers, may not survive an economic downturn, which could directly affect our ability to attain our operating goals on schedule and on budget.

We will need to expand our operations and increase the size of our company, and we may experience difficulties in managing growth.

As we advance our product candidates through preclinical studies and clinical trials, and develop new product candidates, we will need to increase our product development, scientific, regulatory and compliance and administrative

headcount to manage these programs. In addition, to meet our obligations as a public company, we will need to increase our general and administrative capabilities. Our management, personnel and systems currently in place may not be adequate to support this future growth. Our need to effectively manage our operations, growth and various projects requires that we:

- successfully attract and recruit new employees with the expertise and experience we will require;
- manage our clinical programs effectively, which we anticipate being conducted at numerous clinical sites;
- develop a marketing, distribution and sales infrastructure in addition to a post-marketing surveillance program if we seek to market our products directly; and
- continue to improve our operational, manufacturing, quality assurance, financial and management controls, reporting systems and procedures.

If we are unable to successfully manage this growth and increased complexity of operations, our business may be adversely affected.

We depend upon our key personnel and our ability to attract and retain qualified employees.

Our future growth and success will depend in large part on our continued ability to attract, retain, manage and motivate our employees. The loss of the services of a significant portion of our workforce or any member of our senior management or the inability to hire or retain qualified personnel could adversely affect our ability to execute our business plan and harm our operating results.

Because of the specialized nature of our business, we rely heavily on our ability to attract and retain qualified scientific, technical and managerial personnel. In particular, the loss of one or more of our senior executive officers could be detrimental to us if we do not have an adequate succession plan or if we cannot recruit suitable replacements in a timely manner. While our senior executive officers are parties to employment agreements with us, these agreements do not guarantee that they will remain employed with us in the future. In addition, in many cases, these agreements do not restrict our senior executive officers' ability to compete with us after their employment is terminated.

The competition for qualified personnel in the pharmaceutical field is intense, and there is a limited pool of qualified potential employees to recruit. Due to the intense competition for talent, we may be unable to continue to attract and retain qualified personnel necessary for the development of our business or to recruit suitable replacement personnel. We may also face increased costs in attracting and retaining personnel as a result of rising global inflation.

To incentivize valuable employees to join and remain at our company, in addition to salary and other employee benefits, we have provided stock option and restricted stock unit awards that vest over time. The value to employees of such awards may be significantly affected by movements in our stock price, and current market conditions and extreme stock price volatility may diminish our ability to incentivize employees through the use of such awards.

If we are unsuccessful in our recruitment and retention efforts, our business may be harmed.

Under applicable employment laws, we may not be able to enforce covenants not to compete and therefore may be unable to prevent our competitors from benefiting from the expertise of some of our former employees.

Our employment agreements generally include covenants not to compete. These agreements prohibit our employees, if they cease working for us, from competing directly with us or working for our competitors for a limited period. We may be unable to enforce these agreements under the laws of the jurisdictions in which our employees work at all or for a sufficient duration of time to prevent members of our management team from competing with us. If we are unable to enforce these covenants not to compete, we may be unable to prevent our competitors from benefiting from the expertise of our former employees or consultants and our competitiveness may be diminished.

If we are unable to hire additional qualified personnel, our ability to grow our business may be harmed.

Over time we will need to hire additional qualified personnel with expertise in drug development, product registration, clinical, preclinical and nonclinical research, quality compliance, government regulation, formulation and manufacturing, financial matters and sales and marketing. We compete for qualified individuals with numerous biopharmaceutical companies, universities and other research institutions. Competition for such individuals is intense, and our search for such personnel may not be successful. Attracting and retaining qualified personnel will be critical to our success.

Our relationships with customers, physicians, and third-party payors will be subject, directly or indirectly, to federal and state healthcare fraud and abuse laws, false claims laws, health information privacy and security laws, and other healthcare laws and regulations. If we are unable to comply, or have not fully complied, with such laws, we could face substantial penalties.

Healthcare providers and third-party payors in the United States and elsewhere will play a primary role in the recommendation and prescription of any product candidates for which we obtain marketing approval. Our current and future arrangements with healthcare professionals, principal investigators, consultants, customers and third-party payors may subject us to various federal and state fraud and abuse laws and other healthcare laws, including, without limitation, the federal Anti-Kickback Statute, the federal civil and criminal false claims laws and the law commonly referred to as the Physician Payments Sunshine Act and regulations. These laws will impact, among other things, our proposed clinical research, sales, marketing and educational programs. In addition, we may be subject to patient privacy laws by both the federal government and the states in which we conduct or may conduct our business. The laws that will affect our operations include, but are not limited to:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe or rebate), directly or indirectly, overtly or covertly, in cash or in kind, in return for the purchase, recommendation, leasing or furnishing of an item or service reimbursable under a federal healthcare program, such as the Medicare and Medicaid programs;

- federal civil and criminal false claims laws, including, without limitation, the False Claims Act, and civil monetary penalty laws which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment or approval from Medicare, Medicaid or other government payors that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government;

- HIPAA, which created new federal criminal statutes that prohibit a person from, among other things, knowingly and willfully executing a scheme or making false or fraudulent statements to defraud any healthcare benefit program, regardless of the payor (e.g., public or private);

- HIPAA, as amended by HITECH and its implementing regulations, and as amended again by the final HIPAA omnibus rule, Modifications to the HIPAA Privacy, Security, Enforcement, and Breach Notification Rules Under HITECH and the Genetic Information Nondiscrimination Act; Other Modifications to HIPAA, published in January 2013, which imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization by entities subject to the rule, such as health plans, health care clearinghouses and certain health care providers, and their respective business associates and covered subcontractors;

- federal transparency laws, including the federal Physician Payments Sunshine Act, which is part of the Patient Protection and Affordable Care Act ("ACA"), that require certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare & Medicaid Services ("CMS"), information related to: (i) payments or other "transfers of value" made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), other healthcare professionals (such as physician assistants and nurse practitioners), and teaching hospitals; and (ii) ownership and investment interests held by physicians and their immediate family members;

- state and foreign law equivalents of each of the above federal laws, state laws that require manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures, and state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government or to adopt compliance programs as prescribed by state laws and regulations, or that otherwise restrict payments that may be made to healthcare providers; and

- state and foreign laws that govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Because of the breadth of these laws and the narrowness of the statutory exceptions and safe harbors available, it is possible that some of our business activities could be subject to challenge under one or more of such laws.

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, disgorgement, imprisonment, exclusion of drugs from 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 non-compliance with these laws and the curtailment or restructuring of our operations.

The risk of us being found in violation of these laws is increased by the fact that many of them have not been fully interpreted by the regulatory authorities or the courts, and their provisions are open to a variety of interpretations. Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. Any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. The shifting compliance environment and the need to build and maintain robust and expandable systems to comply with multiple jurisdictions with different compliance and/or reporting requirements increases the possibility that a healthcare company may run afoul of one or more of the requirements.

Coverage and adequate reimbursement may not be available for our current or any future product candidates, which could make it difficult for us to sell profitably, if approved.

Market acceptance and sales of any product candidates that we commercialize, if approved, will depend in part on the extent to which reimbursement for these drugs and related treatments will be available from third-party payors, including government health administration authorities, managed care organizations and other private health insurers. Third-party payors decide which therapies they will pay for and establish reimbursement levels. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own coverage and reimbursement policies. However, decisions regarding the extent of coverage and amount of reimbursement to be provided for any product candidates that we develop will be made on a payor-by-payor basis. One payor's determination to provide coverage for a drug does not determine whether or not another payor will also provide coverage, and adequate reimbursement, for the drug. Additionally, a third-party payor's decision to provide coverage for a therapy does not imply that an adequate reimbursement rate will be approved. Each payor determines whether or not it will provide coverage for a therapy, what amount it will pay the manufacturer for the therapy, and on what tier of its formulary it will be placed. The position on a payor's list of covered drugs, or formulary, generally determines the co-payment that a patient will need to make to obtain the therapy and can strongly influence the adoption of such therapy by patients and physicians. Even if favorable coverage and reimbursement status is attained for any product candidate for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future. Patients who are prescribed treatments for their conditions and providers prescribing such services generally rely on third-party payors to reimburse all or part of the associated healthcare costs. Patients are unlikely to use our drugs unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our drugs.

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Coverage and reimbursement may not be available for any drug that we commercialize and, if reimbursement is available, it is

uncertain what the level of reimbursement will be. Inadequate coverage and reimbursement may impact the demand for, or the price of, any drug for which we obtain marketing approval. If coverage and adequate reimbursement are not available, or are available only at limited levels, we may not be able to successfully commercialize our current and any future product candidates that we develop.

Healthcare legislative reform measures may have a negative impact on our business and results of operations.

In the United States and some foreign jurisdictions, there have been, and continue to be, several legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of product candidates, restrict or regulate post-approval activities, and affect our ability to profitably sell any product candidates for which we obtain marketing approval.

Among policy makers and payors in the United States and elsewhere, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives. In March 2010, the ACA was passed, which substantially changed the way healthcare is financed by both the government and private insurers, and significantly impacts the U.S. pharmaceutical industry. The ACA has been subject to judicial and Congressional challenges. For example, on June 17, 2021 the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. Prior to the U.S. Supreme Court ruling, on January 28, 2021, President Biden issued an executive order that initiated a special enrollment period for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA. On August 16, 2022, President Biden signed the Inflation Reduction Act of 2022 ("IRA") into law, which among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in ACA marketplaces through plan year 2025. The IRA also eliminates the "donut hole" under the Medicare Part D program beginning in 2025 by significantly lowering the beneficiary maximum out-of-pocket cost and through a newly established manufacturer discount program. It is possible that the ACA will be subject to judicial or Congressional challenges in the future.

Other legislative changes have been proposed and adopted since the ACA was enacted, including aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect in April 2013 and, due to subsequent legislative amendments to the statute, will remain in effect through 2031, unless additional Congressional action is taken. Under current legislation the actual reduction in Medicare payments will vary from 1% in 2022 to up to 4% in the final fiscal year of this sequester.

Additionally, there has been heightened governmental scrutiny in the United States of pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. Such scrutiny has resulted in several recent congressional inquiries, Presidential executive orders and proposed and enacted federal and state legislation designed to bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs and reform government program reimbursement methodologies for products. For example, in July 2021, the Biden administration released an executive order, "Promoting Competition in the American Economy," with multiple provisions aimed at prescription drugs. In response to Biden's executive order, on September 9, 2021, the U.S. Department of Health and Human Services ("HHS") released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and sets out a variety of potential legislative policies that Congress could pursue as well as potential administrative actions HHS can take to advance these principles. In addition, the IRA, among other things, (1) directs HHS to negotiate the price of certain single-source drugs and biologics covered under Medicare and (2) imposes rebates under Medicare Part B and Medicare Part D to penalize price increases that outpace inflation. These provisions will take effect progressively starting in fiscal year 2023, although they may be subject to legal challenges. It is currently unclear how the IRA will be implemented but is likely to have a significant impact on the pharmaceutical industry. Further, the Biden Administration released an additional executive order on October 14, 2022, directing HHS to submit a report on how the Center for Medicare and Medicaid Innovation can be further leveraged to test new models for lowering drug costs for Medicare and Medicaid beneficiaries. Moreover, changes to the political landscape in the United States may impact the market sentiment surrounding the pharmaceutical industry.

We expect that these and other healthcare reform measures that may be adopted in the future may result in more rigorous coverage criteria and in additional downward pressure on the price that we receive for any approved drug. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability, or commercialize our drugs.

We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our product candidates or additional pricing pressures.

If we obtain approval to commercialize any approved products outside of the United States, a variety of risks associated with international operations could materially adversely affect our business.

If any of our product candidates are approved for commercialization outside of the United States, we intend to enter into agreements with third parties to market them on a worldwide basis or in more limited geographical regions. We expect that we will be subject to additional risks related to entering into international business relationships, including:

- different regulatory requirements for drug approvals;
- reduced protection for intellectual property rights, including trade secret and patent rights;
- unexpected changes in tariffs, export controls, sanctions, trade barriers and regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign taxes, including withholding of taxes;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenues, and other obligations incident to doing business in another country;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad;
- potential noncompliance with the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act 2010 and similar anti-bribery and anticorruption laws in other jurisdictions;
- business interruptions resulting from geopolitical actions, including war (such as Russia's invasion of Ukraine) and terrorism, or natural disasters including earthquakes, hurricanes, floods and fires, economic or political instability, sanctions, or public health emergencies, such as the novel COVID-19 coronavirus and related shelter-in-place orders, travel, social distancing and quarantine policies, boycotts, curtailment of trade and other business restrictions; and
- difficulty in importing and exporting clinical trial materials and study samples.

We are subject to U.S. and certain foreign anti-corruption, anti-money laundering, export and import controls, and sanctions laws and regulations. Non-compliance with such laws can subject us to criminal and/or civil liability and harm our business.

We are subject to the U.S. Foreign Corrupt Practices Act of 1977, as amended, or FCPA, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, and anti-bribery and anti-money laundering laws in the countries in which we conduct activities. Anti-corruption laws are interpreted broadly

and prohibit companies and their employees, agents, and contractors, from authorizing, promising, offering, or providing, directly or indirectly, improper payments or anything else of value to recipients in the public or private sector. The FCPA also requires public companies to make and keep books and records that accurately and fairly reflect the transactions of the corporation and to devise and maintain an adequate system of internal accounting controls. We may have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. In addition, we may engage third-party intermediaries to promote our clinical research activities and/or to obtain necessary permits, licenses, and other regulatory approvals. We can be held liable for the corrupt or other illegal activities of our employees, agents, contractors, or other partners even if we do not explicitly authorize or have actual knowledge of such activities.

We are also subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, various economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls. Export controls and trade sanctions laws and regulations may restrict or prohibit altogether the provision, sale, or supply of our product candidates to certain governments, persons, entities, countries, and territories, including those that are the target of comprehensive sanctions or an embargo.

We cannot ensure that all of our employees, agents, contractors or those of our affiliates, will comply with all applicable laws and regulations. Violations of anti-corruption, anti-money laundering, import and export control, or sanctions laws and regulations could result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, breach of contract and fraud litigation, reputational harm, and other consequences.

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

We will face an inherent risk of product liability exposure related to the testing of our product candidates in clinical trials and will face an even greater risk if we commercialize any of our product candidates. If we cannot successfully defend ourselves against claims that our product candidates caused injuries, we could incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidates that we may develop;
- injury to our reputation and significant negative media attention;
- initiation of investigations by regulators;
- withdrawal of clinical trial participants;
- significant time and expenses to defend the related litigation;
- diversion of management and scientific resources from our business operations;
- substantial monetary awards to trial participants or patients;
- loss of revenue; and
- the inability to commercialize any product candidates that we may develop.

We currently hold limited product liability insurance coverage. We will need to purchase additional product liability insurance coverage as we expand our clinical trials, and if we commence commercialization of our product candidates. Insurance coverage is increasingly expensive. If we are unable to obtain insurance at an acceptable cost or otherwise protect against potential product liability claims, we will be exposed to significant liabilities, which may materially and adversely affect our business and financial position. If we are sued for any injury allegedly caused by our or our collaborators' products, our liability could exceed our total assets and our ability to pay the liability. A product liability claim or series of claims brought against us would decrease our cash and could cause our stock price to fall.

We are subject to stringent and evolving U.S. and foreign laws, regulations, rules, contractual obligations, policies and other obligations related to data privacy and security. Our actual or perceived failure to comply with such obligations could lead to regulatory investigations or actions; litigation; fines and penalties; disruptions of our business operations; reputational harm; loss of revenue or profits; and other adverse business consequences.

In the ordinary course of business, we process personal information and other sensitive information, including proprietary and confidential business data, trade secrets, intellectual property, data we collect about trial participants in connection with clinical trials, and sensitive third-party data. Our data processing activities may subject us to numerous data privacy and security obligations, such as various laws, regulations, guidance, industry standards, external and internal privacy and security policies, contracts, and other obligations that govern the processing of personal information by us and on our behalf.

In the United States, federal, state, and local governments have enacted numerous data privacy and security laws, including data breach notification laws, personal information privacy laws, consumer protection laws (e.g. Section 5 of the Federal Trade Commission Act) and other similar laws (e.g., wiretapping laws). For example, HIPAA, as amended by HITECH, imposes specific requirements relating to the privacy, security, and transmission of protected health information. As another example, the CCPA, applies to the personal information of consumers, business representatives, and employees who are California residents, and requires businesses to provide specific disclosures in privacy notices and honor requests of such California residents to exercise certain rights related to their personal information. The CCPA allows for administrative fines for noncompliance (up to $7,500 per violation) and allows private litigants affected by certain data breaches to recover significant statutory damages. Although the CCPA exempts some data processed in the context of clinical trials, the CCPA increases compliance costs and potential liability with respect to other personal information we maintain about California residents. In addition, the CPRA expanded the CCPA's requirements, including by adding a new right for individuals to correct their personal information and establishing a new regulatory agency, the California Privacy Protection Agency, to implement and enforce the law, which could increase the risk of enforcement. Several other states have also enacted data privacy laws. For example, Virginia passed the Consumer Data Protection Act, Colorado passed the Colorado Privacy Act, Connecticut passed the Connecticut Data Privacy Act and Utah passed the Utah Consumer Privacy Act, all of which became or will become effective in 2023. In addition, data privacy and security laws have been proposed at the federal, state, and local levels in recent years. While some of these laws exempt data processed in the context of clinical trials, these developments may nonetheless further complicate compliance efforts.

Outside the United States, an increasing number of laws, regulations, and industry standards apply to data privacy and security. For example, the EU GDPR and the UK GDPR, impose strict requirements for processing personal information, and violators of these laws face significant penalties. For example, under the EU GDPR, government regulators may impose temporary or definitive bans on data processing, as well as fines of up to 20 million euros (17.5 million British Pounds under the UK GDPR) or 4% of annual global revenue, whichever is greater, or we may be subject to private litigation related to processing of personal information brought by classes of data subjects or consumer protection organizations authorized at law to represent. In addition, the Swiss Federal Act on Data Protection, or DPA, also applies to the collection and processing of personal information, including health-related information, by companies located in Switzerland, or in certain circumstances, by companies located outside of Switzerland. The DPA has been revised, and the revised version and its revised ordinances will enter into force in September 2023.

In addition, we may be unable to transfer personal information from Europe and other jurisdictions to the United States or other countries due to data localization requirements or limitations on cross-border data flows. Europe and other jurisdictions have enacted laws requiring data to be localized or limiting the transfer of personal information to other countries. In particular, the European Economic Area (EEA), the United Kingdom (UK) and Switzerland have significantly restricted the transfer of personal information to the United States and other countries whose privacy laws it believes are inadequate. Other jurisdictions may adopt similarly stringent interpretations of their data localization and cross-border data transfer laws. Although there are currently various mechanisms that may be used to transfer personal information from the EEA and UK to the United States in compliance with law, such as the EEA and UK's standard contractual clauses, these mechanisms are subject to legal challenges, and there is no assurance that we can satisfy or rely on these measures to lawfully transfer personal information to the United States. If there is no lawful manner for us to transfer personal information from the EEA, the UK, or other jurisdictions to the United States, or if the requirements for a legally-compliant transfer are too onerous, we could face significant adverse consequences, including the interruption or degradation of our operations, the need to relocate part of or all of our business or data processing activities to other jurisdictions at significant expense, increased exposure to regulatory actions, substantial

fines and penalties, the inability to transfer data and work with partners, vendors and other third parties, and injunctions against our processing or transferring of personal information necessary to operate our business. Some European regulators have prevented companies from transferring personal information out of Europe for allegedly violating the EU GDPR's cross-border data transfer limitations.

In addition to data privacy and security laws, we are contractually subject to industry standards adopted by industry groups and may become subject to such obligations in the future. We are also bound by other contractual obligations related to data privacy and security, and our efforts to comply with such obligations may not be successful.

Furthermore, we publish privacy policies, marketing materials, and other statements, such as compliance with certain certifications or self-regulatory principles, regarding data privacy and security. If these policies, materials or statements are found to be deficient, lacking in transparency, deceptive, unfair, or misrepresentative of our practices, we may be subject to investigation, enforcement actions by regulators, or other adverse consequences.

Obligations related to data privacy and security are quickly changing in an increasingly stringent fashion, creating some uncertainty as to the effective future legal framework. Additionally, these obligations may be subject to differing applications and interpretations, which may be inconsistent or conflict among jurisdictions. Preparing for and complying with these obligations requires significant resources and may necessitate changes to our information technologies, systems, and practices and to those of any third parties that process personal information on our behalf. Although we endeavor to comply with all applicable data privacy and security obligations, we may at times fail (or be perceived to have failed) to do so. Moreover, despite our efforts, our personnel or third parties upon whom we rely may fail to comply with such obligations, which could negatively impact our business operations and compliance posture. For example, any failure by a third-party processor to comply with applicable law, regulations, or contractual obligations could result in adverse effects, and proceedings against us by governmental entities or others.

If we or the third parties upon which we rely fail, or are perceived to have failed, to address or comply with data privacy and security obligations, we could face significant consequences. These consequences may include, but are not limited to, government enforcement actions (e.g., investigations, fines, penalties, audits, inspections, and similar); litigation (including class-related claims); additional reporting requirements and/or oversight; bans on processing personal information; orders to destroy or not use personal information; and imprisonment of company officials. Any of these events could have a material adverse effect on our reputation, business, or financial condition, including but not limited to: loss of customers; interruptions or stoppages in our business operations (including, as relevant, clinical trials); inability to process personal information or to operate in certain jurisdictions; limited ability to develop or commercialize our products; expenditure of time and resources to defend any claim or inquiry; adverse publicity; or revision or restructuring of our operations.

If our information technology systems or data, or those of third parties upon which we rely, or our data are or were compromised, we could experience adverse consequences resulting from such compromise, including but not limited to regulatory investigations or actions; litigation; fines and penalties; disruptions of our business operations; reputational harm; loss of revenue or profits; and other adverse consequences.

In the ordinary course of our business, we or the third parties upon which we rely process proprietary, confidential, and sensitive data, including personal information (such as health-related data), intellectual property, and trade secrets (collectively, sensitive information).

Cyberattacks, malicious internet-based activity, and online and offline fraud are prevalent and continue to increase. These threats are becoming increasingly difficult to detect. These threats come from a variety of sources, including traditional computer "hackers," threat actors, "hacktivists," personnel (such as through theft or misuse), sophisticated nation states, and nation-state-supported actors. Some actors now engage and are expected to continue to engage in cyber-attacks, including without limitation nation-state actors for geopolitical reasons and in conjunction with military conflicts and defense activities. During times of war and other major conflicts, including the war in Ukraine, we and the third parties upon which we rely may be vulnerable to a heightened risk of these attacks, including cyber-attacks, that could materially disrupt our systems and operations, supply chain, and ability to produce, sell and distribute our goods and services.

We and the third parties upon which we rely are subject to a variety of evolving threats, including but not limited to social-engineering attacks (including through phishing attacks), malicious code (such as viruses and worms), malware (including as a result of advanced persistent threat intrusions), denial-of-service attacks (such as credential

stuffing), credential harvesting, personnel misconduct or error, ransomware attacks, supply-chain attacks, software bugs, server malfunctions, software or hardware failures, loss of data or other information technology assets, adware, telecommunications failures, and other similar threats. In particular, ransomware attacks, including by organized criminal threat actors, nation-states, and nation-state-supported actors, are becoming increasingly prevalent and severe and can lead to significant interruptions in our operations, loss of data and income, reputational harm, and diversion of funds. Extortion payments may alleviate the negative impact of a ransomware attack, but we may be unwilling or unable to make such payments due to, for example, applicable laws or regulations prohibiting such payments.

Remote work has become more common and has increased risks to our information technology systems and data, as more of our employees utilize network connections, computers, and devices outside our premises or network, including working from home, while in transit and in public locations. Future or past business transactions (such as acquisitions or integrations) could expose us to additional cybersecurity risks and vulnerabilities, as our systems could be negatively affected by vulnerabilities present in acquired or integrated entities' systems and technologies. Furthermore, we may discover security issues that were not found during due diligence of such acquired or integrated entities, and it may be difficult to integrate companies into our information technology environment and security program.

We rely upon third-party service providers and technologies to operate critical business systems to process sensitive information in a variety of contexts, including, without limitation, third-party providers of cloud-based infrastructure, encryption and authentication technology, employee email, content delivery to customers, and other functions. Our ability to monitor these third parties' information security practices is limited, and these third parties may not have adequate information security measures in place. If our third-party service providers experience a security incident or other interruption, we could experience adverse consequences. While we may be entitled to damages if our third-party service providers fail to satisfy their privacy or security-related obligations to us, any award may be insufficient to cover our damages, or we may be unable to recover such award. Additionally, supply-chain attacks have increased in frequency and severity, and we cannot guarantee that third parties and infrastructure in our supply chain or our third-party partners' supply chains have not been compromised or that they do not contain exploitable defects or bugs that could result in a breach of or disruption to our information technology systems or the third-party information technology systems that support us and our services.

Any of the previously identified or similar threats could cause a security incident or other interruption. A security incident or other interruption could result in unauthorized, unlawful, or accidental acquisition, modification, destruction, loss, alteration, encryption, disclosure of, or access to our sensitive information. A security incident or other interruption could disrupt our ability (and that of third parties upon whom we rely) to operate our business.

We may expend significant resources or modify our business activities (including our clinical trial activities) to try to protect against security incidents. Certain data privacy and security obligations may require us to implement and maintain specific security measures, industry-standard or reasonable security measures to protect our information technology systems and sensitive information. While we have implemented security measures designed to protect against security incidents, there can be no assurance that these measures will be effective. We take steps to detect and remediate vulnerabilities in our information technology systems, but we may not be able to detect and remediate all vulnerabilities because the threats and techniques used to exploit the vulnerability change frequently and are often sophisticated in nature. Therefore, such vulnerabilities could be exploited but may not be detected until after a security incident has occurred. These vulnerabilities pose material risks to our business. Despite our efforts to identify and address vulnerabilities, if any, in our information technology systems, our efforts may not be successful. Further, we may experience delays in developing and deploying remedial measures designed to address any such identified vulnerabilities.

Applicable data privacy and security obligations may require us to notify relevant stakeholders of security incidents. Such disclosures are costly, and the disclosure or the failure to comply with such requirements could lead to adverse consequences. If we (or a third party upon whom we rely) experience a security incident or are perceived to have experienced a security incident, we may experience adverse consequences. These consequences may include: government enforcement actions (for example, investigations, fines, penalties, audits, and inspections); additional reporting requirements and/or oversight; restrictions on processing sensitive information (including personal information); litigation (including class claims); indemnification obligations; negative publicity; reputational harm; monetary fund diversions; interruptions in our operations (including availability of data); financial loss; and other similar harms.

Our contracts may not contain limitations of liability, and even where they do, there can be no assurance that limitations of liability in our contracts are sufficient to protect us from liabilities, damages, or claims related to our data privacy and security obligations.

Risks Related to Ownership of Our Common Stock

The market price for our common stock has been and likely will continue to be volatile, and your investment in our securities could decline in value.

Our stock price has been highly volatile since our IPO and is likely to continue to be volatile. The stock market in general, and the markets for pharmaceutical, biopharmaceutical and biotechnology stocks in particular, have experienced extreme price and volume fluctuations that have been often unrelated or disproportionate to the operating performance of the issuer. In particular, the trading prices for pharmaceutical, biopharmaceutical and biotechnology companies have been highly volatile as a result of the impact of the COVID-19 pandemic and other market factors. The market price for our common stock may be influenced by many factors, including:

- results from, and any delays in our preclinical studies and any other future clinical development programs, including any delays related to the health epidemics or pandemics such as the COVID-19 pandemic or other factors outside of our control;
- actual or anticipated changes in estimates as to financial results, development timelines and other company milestones or recommendations by securities analysts;
- announcements of changes to our operational focus, including changes to the programs we are actively developing;
- announcements by our competitors of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments;
- announcements of technological innovations or new products by us or our competitors;
- announcement of FDA approval or disapproval of our product candidates or other product-related actions;
- developments involving our discovery efforts and clinical trials;
- developments or disputes concerning patents or proprietary rights, including announcements of infringement, interference or other litigation against us or our potential licensees;
- developments involving our efforts to commercialize our products, including developments impacting the timing of commercialization;
- announcements concerning our competitors, or the biotechnology, pharmaceutical or drug delivery industry in general;
- public concerns as to the safety or efficacy of our product candidates or our competitors' products;
- changes in government regulation of the pharmaceutical or medical industry;
- changes in the reimbursement policies of third-party insurance companies or government agencies;
- actual or anticipated fluctuations in our operating results;
- changes in financial estimates or recommendations by securities analysts;
- developments involving corporate collaborators, if any;

- changes in accounting principles;

- general economic, industry and market conditions, increasing inflation and measures taken by central banks to combat inflation, exchange rate fluctuations, supply chain disruptions and increasing commodity, energy and fuel prices;

- the impact of political instability, natural disasters, events of terrorism and/or war, such as the war between Ukraine and Russia, and the corresponding tensions created from such conflict between Russia, the United States and countries in Europe as well as other countries such as China; and

- the loss of any of our key scientific or management personnel.

In the past, securities class action litigation has often been brought against companies that experience volatility in the market price of their securities and in particular, biotechnology and pharmaceutical companies. Whether or not meritorious, litigation brought against us could result in substantial costs and a diversion of management's attention and resources, which could adversely affect our business, operating results and financial condition.

Stock market volatility and declines in the price of our common stock also increase the likelihood that we may fail to meet the minimum price requirements for continued listing on the Nasdaq Global Market. If the Nasdaq Global Market delists our securities from trading on its exchange for failure to meet the listing standards, we and our stockholders could face significant negative consequences, including:

- limited availability of market quotations for our securities;

- a determination that the common stock is a "penny stock" which will require brokers trading in the common stock to adhere to more stringent rules, possibly resulting in a reduced level of trading activity in the secondary trading market for shares of common stock;

- a limited amount of analyst coverage; and

- a decreased ability to issue additional securities or obtain additional financing in the future.

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

As a public company, and particularly after we will no longer qualify as an emerging growth company, we incur and will continue to incur significant legal, accounting and other expenses that we did not incur previously. The Sarbanes-Oxley Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements of Nasdaq, and other applicable securities rules and regulations impose various requirements on U.S. reporting public companies, including the establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. These rules and regulations are often subject to varying interpretations, and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

While we remain an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. However, we are required, pursuant to Section 404 of the Sarbanes-Oxley Act, to furnish a report by management on, among other things, the effectiveness of our internal control over financial reporting. The process to document and evaluate our internal control over financial reporting, is both costly and challenging. In this regard, we need to continue to dedicate internal resources, validate through testing that controls are functioning as designed and maintain a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that we will not be able to conclude, within the prescribed timeframe or at all, that our internal control over financial

reporting is effective as required by Section 404. If we identify one or more material weaknesses, it could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

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

We qualify as an "emerging growth company," as defined in the JOBS Act. For so long as we remain an emerging growth company, we are permitted and plan to rely on exemptions from certain disclosure requirements that are applicable to public companies that are not emerging growth companies. These provisions include, but are not limited to: being permitted to report only two years of audited financial statements and only two years of related selected financial data and management's discussion and analysis of financial condition and results of operations disclosure; an exemption from compliance with the auditor attestation requirement in the assessment of our internal control over financial reporting pursuant to Section 404 of the Sarbanes-Oxley Act; reduced disclosure obligations regarding executive compensation arrangements in our periodic reports, registration statements and proxy statements; and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. In addition, the JOBS Act permits emerging growth companies to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies. As a result, the information we provide might be different from the information that is available for other public companies. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock, and the market price of our common stock may be more volatile.

We will remain an emerging growth company until the earliest of (i) December 31, 2026, (ii) the first fiscal year after our annual gross revenue exceeds $1.07 billion, (iii) the date on which we have, during the immediately preceding three-year period, issued more than $1.00 billion in non-convertible debt securities, or (iv) the end of any fiscal year in which the market value of our common stock held by non-affiliates exceeds $700 million as of the end of the second quarter of that fiscal year.

Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.

We have incurred substantial losses during our history, do not expect to become profitable in the foreseeable future and may never achieve profitability. Under applicable U.S. federal income tax law, our federal net operating loss, or NOL, carryforwards generated in tax years beginning on or before December 31, 2017, are only permitted to be carried forward for 20 years. Our federal NOL carryforwards generated in tax years beginning after December 31, 2017, may be carried forward indefinitely, but the deductibility of such federal NOL carryforward may be limited. It is uncertain if and to what extent various states will conform to U.S. federal income tax law with respect to the treatment of NOL carryforwards. In addition, under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, and corresponding provisions of state law, if a corporation undergoes an "ownership change," generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period, the corporation's ability to use its pre-change NOL carryforwards, and other pre-change tax attributes (such as research tax credits) to offset its post-change income or taxes may be limited. We have experienced ownership changes in the past. In addition, we may experience ownership changes in the future as a result of subsequent shifts in our stock ownership, some of which are outside of our control. As a result, if we earn net taxable income, our ability to use our pre-change NOL carryforwards to offset taxable income may be limited, which could potentially result in increased future tax liability to us. In addition, at the state level, there may be periods during which the use of NOLs carryforwards is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed by us.

Changes in tax laws or regulations that are applied adversely to us or our customers may have a material adverse effect on our business, cash flow, financial condition, or results of operations.

New tax laws, statutes, rules, regulations, or ordinances could be enacted at any time. For instance, the recently enacted Inflation Reduction Act imposes, among other rules, a 15% minimum tax on the book income of certain large corporations and a 1% excise tax on certain corporate stock repurchases. Further, existing tax laws, statutes, rules, regulations, or ordinances could be interpreted differently, changed, repealed, or modified at any time. Any such enactment, interpretation, change, repeal, or modification could adversely affect us, possibly with retroactive effect. In particular, changes in corporate tax rates, the realization of our net deferred tax assets, the taxation of foreign earnings, and the deductibility of expenses under the Tax Act, as amended by the Coronavirus Aid, Relief, and

Economic Security Act or any future tax reform legislation, could have a material impact on the value of our deferred tax assets, result in significant one-time charges, and increase our future tax expenses.

We do not anticipate paying dividends on our common stock and, accordingly, stockholders must rely on stock appreciation for any return on their investment.

We have never declared or paid cash dividends on our common stock and do not expect to do so in the foreseeable future. The declaration of dividends is subject to the discretion of our board of directors and limitations under applicable law, and will depend on various factors, including our operating results, financial condition, future prospects and any other factors deemed relevant by our board of directors. You should not rely on an investment in our company if you require dividend income from your investment in our company. The success of your investment will likely depend entirely upon any future appreciation of the market price of our common stock, which is uncertain and unpredictable. There is no guarantee that our common stock will appreciate in value.

Sales of a substantial number of shares of our common stock by our existing stockholders in the public market could cause our stock price to fall.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. If our stockholders sell, or the market perceives that our stockholders intend to sell, substantial amounts of our common stock in the public market, the market price of our common stock could decline significantly. We cannot predict what effect, if any, sales of our shares in the public market or the availability of shares for sale will have on the market price of our common stock. However, future sales of substantial amounts of our common stock in the public market, including shares issued upon exercise of outstanding options, or the perception that such sales may occur, could adversely affect the market price of our common stock.

We also expect that significant additional capital may be needed in the future to continue our research and development activities and costs associated with operating as a public company. To raise capital, we may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner we determine from time to time. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock.

The rights of the holders of our securities may be impaired by the potential issuance of preferred stock.

Our articles of incorporation give our board of directors the ability to designate and issue preferred stock in one or more series. As a result, the board of directors may, without stockholder approval, issue preferred stock with voting, dividend, conversion, liquidation or other rights which could adversely affect the relative voting power and equity interest of the holders of common stock. Preferred stock, which could be issued with the right to more than one vote per share, could have the effect of discouraging, delaying or preventing a change of control of us. The possible impact on takeover attempts could adversely affect the price of our securities. Although we have no present intention to designate any series, or issue any shares, of preferred stock, other than pursuant to the IPO, we may do so in the future.

If securities or industry analysts do not publish research or reports about our business, or if they change their recommendations regarding our stock adversely, our stock price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that industry or securities analysts publish about us or our business. Our research coverage by industry and financial analysts is currently limited. Even if our analyst coverage increases, if one or more of the analysts who cover us downgrade our stock, our stock price would likely decline. If one or more of these analysts cease coverage of our company or fail to regularly publish reports on us, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

Anti-takeover provisions in our organizational documents and Delaware law might discourage or delay attempts to acquire us that you might consider favorable.

Our amended and restated certificate of incorporation (the "Amended Charter") and amended and restated bylaws (the "Amended Bylaws") contain provisions that may make the merger or acquisition of us more difficult without the approval of our board of directors. Among other things, these provisions:

- allow us to authorize the issuance of undesignated preferred stock in connection with a stockholder rights plan or otherwise, the terms of which may be established and the shares of which may be issued without stockholder approval, and which may include super voting, special approval, dividend, or other rights or preferences superior to the rights of the holders of common stock;

- provide that our bylaws may be amended or repealed only by a majority vote of our board of directors or by the affirmative vote of the holders of at least 66 2/3% of the votes which all our stockholders would be entitled to cast in any annual election of directors; and

- establish advance notice requirements for nominations for elections to our board of directors or for proposing matters that can be acted upon by stockholders at stockholder meetings.

Further, as a Delaware corporation, we are also subject to provisions of Delaware law, which may impair a takeover attempt that our stockholders may find beneficial. These anti-takeover provisions and other provisions under Delaware law could discourage, delay, or prevent a transaction involving a change in control of us, including actions that our stockholders may deem advantageous, or could negatively affect the market price of our common stock. These provisions could also discourage proxy contests and make it more difficult for you and other stockholders to elect directors of your choosing and to cause us to take other corporate actions our stockholders desire.

Our Amended Charter provides that the Court of Chancery of the State of Delaware will be the sole and exclusive forum for substantially all disputes between us and our stockholders and federal district courts will be the sole and exclusive forum for Securities Act claims, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, or employees.

Our Amended Charter provides that, unless we consent to the selection of an alternative forum, the Court of Chancery of the State of Delaware is the sole and exclusive forum for: (i) any derivative action or proceeding brought on our behalf; (ii) any action asserting a claim of breach of fiduciary duty owed by any of our directors, officers, or other employees to us or to our stockholders; (iii) any action asserting a claim arising pursuant to the Delaware General Corporation Law (the "DGCL"), the Amended Charter or the Amended Bylaws or as to which the DGCL confers exclusive jurisdiction on the Court of Chancery of the State of Delaware; or (iv) any action asserting a claim governed by the internal affairs doctrine, provided that the exclusive forum provisions will not apply to suits brought to enforce any liability or duty created by the Securities Exchange Act of 1934, as amended, or the Exchange Act or to any claim for which the federal courts have exclusive jurisdiction. Our Amended Charter will further provide that, unless we consent in writing to the selection of an alternative forum, the federal district courts are the sole and exclusive forum for the resolution of any complaint asserting a right under the Securities Act, subject to a final adjudication in the State of Delaware of the enforceability of such exclusive forum provision. We note that investors cannot waive compliance with the federal securities laws and the rules and regulations thereunder. The choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers, or other employees, which may discourage such lawsuits against us and our directors, officers, and other employees. Alternatively, if a court were to find the choice of forum provisions contained in our Amended Charter to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business, results of operations, and financial condition.

Provisions in our organizational documents regarding exculpation and indemnification of our directors and officers may result in substantial expenditures by us and may discourage lawsuits against our directors and officers.

Our Amended Charter and Amended Bylaws provide for the elimination, to the maximum extent permissible under Delaware law, of the personal liability of our directors and officers to us and our stockholders for damages for breach of fiduciary duty. These provisions may discourage us, or our stockholders through derivative litigation, from bringing a lawsuit against any of our current or former directors or officers for any breaches of their fiduciary duties, even if such legal actions, if successful, might benefit us or our stockholders. In addition, our Amended Charter and

Amended Bylaws provide that we will, to the fullest extent permitted by Delaware law, indemnify our directors and officers for costs or damages incurred by them in connection with any threatened, pending, or completed action, suit, or proceeding brought against them by reason of their positions as directors and officers. We also intend to enter into indemnification agreements with each of our directors and executive officers. These indemnification obligations could result in us incurring substantial expenditures to cover the cost of settlement or damage awards against our directors or officers.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our principal executive office is located in Bethesda, Maryland, where we lease in a multi-tenant building 1,568 square feet of office space that we use for our administrative, investor relations and business developments and other activities. This lease expires in September 2024.

We lease in a multi-tenant building 2,992 square feet of office space in Via Soave n.6, Lugano Switzerland that we use for our general management team, research and administrative activities. This lease expires in May 2026.

We lease in a multi-tenant building 1,402 square feet that we use for our biology laboratory and 245 square feet that we use for a warehouse space in Cluster II Building in the Parc Cientific de Barcelona, Spain. This lease expires in December 2025.

We lease in a multi-tenant building 1,417 square feet of office space in Torre D Building in the Parc Cientific de Barcelona, Spain that we use for our general management and research activities. This lease expires in November 2026.

We believe our current facilities, including the terms and conditions of the relevant lease agreements, are adequate to operate our businesses as currently conducted. However, as we continue to expand our operations, we may need to lease additional or alternative facilities.

ITEM 3. LEGAL PROCEEDINGS

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS, AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information and Holders

Our common stock trades on the Nasdaq Global Market (the "Nasdaq") under the trading symbol "GANX." As of February 28, 2023, there were approximately 64 holders of record of our common stock. This number does not reflect the beneficial holders of our common stock for whom shares are held in "nominee" or "street" name through brokerage accounts or other nominees.

Dividends

We have never declared or paid cash dividends on our share capital, and we do not currently intend to pay any cash dividends on our share capital in the foreseeable future. We currently intend to retain all available funds and any future earnings, if any, to fund the development and expansion of our business. Any future determination related to dividend policy will be made at the discretion of our board of directors, subject to applicable laws, and will depend

upon, among other factors, our results of operations, financial condition, contractual restrictions, and capital requirements. In addition, our ability to pay cash dividends on our share capital in the future may be limited by the terms of any future debt or preferred securities we issue or any credit facilities we enter into.

ITEM 6. SELECTED FINANCIAL DATA

Reserved.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

OVERVIEW

We are a biotechnology company developing novel small molecule therapeutics to treat diseases across several therapeutic areas, including central nervous system ("CNS") disorders, lysosomal storage disorders ("LSDs"), metabolic disorders, and other diseases that can be targeted through protein degradation, such as oncology. We use our exclusively in-licensed computational target and drug discovery platform, Site-Directed Enzyme Enhancement Therapy ("SEE-Tx®"), to discover novel allosteric binding sites on proteins implicated in a disease and to identify proprietary small molecules that bind these sites to modulate protein function and treat the underlying cause of the disease. We believe that SEE-Tx® is uniquely suited to identify allosteric binding sites on the protein surface, which are different from the protein's active (or orthosteric) binding site where the natural ligand of the protein binds. Targeting an allosteric binding site instead of the active binding site of a protein provides numerous advantages, including: the ability to regulate proteins implicated in disease through several different mechanisms of action covering both functional and conformational effects, including stabilization, destabilization, targeted degradation, allosteric inhibition, and allosteric activation of the targeted protein; improved specificity of small molecules because binding to an allosteric binding site is non-competitive with the natural substrate that binds to the active binding site; and the ability to identify small molecules with more favorable drug-like properties. The SEE-Tx® platform has been used to identify novel allosteric sites and small molecules for all of our internal programs and partnered programs. Discovering and targeting novel allosteric sites with our platform not only reduces traditional drug discovery timelines but enables rational drug design and offers the potential for superior small molecule drugs that are highly specific and that can penetrate hard to reach tissues and cross the blood-brain barrier.

We have generated an extensive preclinical data package providing evidence of the mechanism of action and effect of our lead product candidate GT-02287 for the treatment of GBA1 Parkinson's disease, including restoration of GCase function, reduction of toxic lipid substrates and toxic forms of alpha-synuclein, improved survival of dopaminergic neurons, and increase of dopamine levels and improved locomotor function in animal models. We anticipate completing IND-enabling toxicology studies in the first half of 2023 with the goal of filing the dossier required to commence a first-time-in-human, Phase 1 clinical trial of GT-02287 in the second half of 2023. We plan to conduct the Phase 1 clinical trial in Australia and evaluate administration of both single and multiple ascending dose levels of GT-02287 in healthy volunteers to assess safety and pharmacokinetics.

In addition, we plan to continue to advance research programs and initiate additional programs targeting allosteric binding sites identified with the SEE-Tx® platform in various therapeutic areas, mainly oncology. Through academic partnerships, co-development and licensing arrangements, we intend to develop a broad pipeline of therapeutics, using our novel approach of identifying and targeting previously unknown allosteric sites.

In response to the current financing environment, we continue to streamline our operational plans to become more capital efficient. We are focusing on progressing our Parkinson's and Gaucher disease programs and remain opportunistic to partnering opportunities for these lead programs and for drug discovery collaborations with our exclusively in-licensed computational SEE-Tx® platform. In addition, we expect to continue to develop our program for Krabbe disease and liver and lung disease program, and use our exclusively in-licensed computational SEE-Tx® platform to establish new programs in oncology while seeking non-dilutive funding in order to continue or progress our other research programs.

We continue to monitor the impacts on our operations and access to financing of global and worsening macroeconomic conditions, such as the war in Ukraine, global geopolitical tension, the COVID-19 pandemic, heightened inflation and rising interest rates, exchange rate fluctuations, supply chain disruptions, recent and potential future bank failures and increases in commodity, energy and fuel prices.

Financial Condition

Since our inception in 2017, we have devoted substantially all of our resources to identify and develop next-generation brain-penetrant allosteric small molecules for the treatment of devastating diseases with high-unmet medical needs using our in-licensed SEE-Tx® platform. Our operations have consisted primarily of organizing and staffing the Company, expanding its operations, securing financing, performing research, conducting preclinical studies and acquiring, developing and securing our in-licensed technology. To date, we do not have any product candidates approved for sale and have not generated any revenue from product sales, and as a result, we face risks associated with early-stage biotechnology companies whose product candidates are in development. We will not generate revenue from product sales unless and until we successfully complete clinical development and obtain regulatory approval for our product candidates. We expect our research and development expenses to remain significant and to increase to support progress in our research and development activities. In addition, if we obtain regulatory approval for our product candidates and do not enter into a third-party commercialization partnership, we expect to incur significant expenses related to developing our commercialization capability to support product sales, marketing, manufacturing and distribution activities. These efforts require significant amounts of additional capital for us to complete our research and development, achieve our research and development objectives, defend our intellectual property rights, and recruit and retain skilled personnel, and key members of management. Even if our product development efforts are successful, it is uncertain when, if ever, we will realize significant revenue from product sales.

We have financed our operations through a combination of sales of convertible preferred stock, including Series A Preferred Stock and Series B Preferred Stock, and our initial public offering ("IPO") of our common stock, as well as research grants. In 2019 and 2020, through our Series A and Series B financings, we raised $14 million in aggregate gross proceeds. On March 17, 2021, we completed our IPO and issued and sold approximately 4.1 million shares of our common stock at a public offering price of $11.00 per share, including approximately 0.5 million shares in connection with the full exercise of the underwriters' option to purchase additional shares, resulting in net proceeds of approximately $40.5 million, after deducting the underwriting discounts and commissions and offering expenses. From inception through December 31, 2022, we have raised an aggregate of $60 million of gross proceeds through the issuance of convertible preferred stock and our IPO.

As of December 31, 2022, we had cash, cash equivalents and marketable securities of $22.1 million. For the year ended December 31, 2022, we had cash outflows from operations of $14.7 million. We have incurred recurring losses and negative cash flows from operations since inception and as of December 31, 2022 and December 31, 2021, had an accumulated deficit of $38.5 million and $20.9 million, respectively. We anticipate incurring additional losses until such time, if ever, that we can generate sales of our product candidates currently in development. We have not generated any product revenues and have not achieved profitable operations. There is no assurance that profitable operations will ever be achieved, and, if achieved, could be sustained on a continuing basis. In addition, we will need significant additional financing to fund our operations and to develop our product candidates. We believe that our existing cash, cash equivalents and marketable securities will enable us to fund our operating expenses and capital expenditure requirements into the second quarter of 2024.

Financing Requirements; Current Financing Environment

Until such time, if ever, as we can generate substantial product revenues to support our cost structure, we expect to seek additional funding through a combination of public or private equity offerings, debt financings, government or private party grants, collaborations, strategic alliances and licensing arrangements. We may not be able to obtain financing on acceptable terms, or at all, and we may not be able to enter into strategic alliances or other arrangements on favorable terms, or at all. The terms of any financing may adversely affect our holdings or the rights of our stockholders. If we are unable to obtain funding, we could be required to delay, limit, reduce or eliminate research and development programs, product portfolio expansion or future commercialization efforts, or grant rights to develop and market our product candidates even if we would otherwise prefer to develop and market such candidates ourselves, which could adversely affect our business prospects.

The war in Ukraine, global geopolitical tension, and COVID-19 pandemic continue to have unpredictable impacts on global societies, economies, financial markets, and business practices. Recently worsening global macroeconomic conditions, including actions taken by central banks to counter inflation, recent and potential future bank failures, volatility in the capital markets and related market uncertainty, may impact our ability to obtain additional financing when needed on favorable terms or at all.

In May 2022, we filed a shelf registration statement on Form S-3, which covers the offering, issuance and sale of up to a maximum aggregate offering price of $100.0 million of any combination of our common stock, preferred stock, debt securities and/or warrants from time to time in one or more offerings (the "Shelf Registration Statement"). We are currently subject to General Instruction I.B.6 to Form S-3 (the "Baby Shelf Rule"), and the amount of funds we can raise through primary public offerings of securities in any twelve-month period using our Shelf Registration Statement is limited to one-third of the aggregate market value of the voting and non-voting common equity held by non-affiliates. We will be limited by the Baby Shelf Rule until such time as our public float exceeds $75.0 million. As of December 31, 2022, the Company has not sold any securities pursuant to the Shelf Registration Statement.

In May 2022, we entered into a Controlled Equity Offering[SM] Sales Agreement, or Sales Agreement with Cantor Fitzgerald & Co. ("Cantor"), pursuant to which we may offer and sell shares of our common stock having an aggregate offering price of up to $16.0 million from time to time through or to Cantor, acting as our agent or principal, in a series of one or more at-the-market equity offerings. Cantor is not required to sell any specific amount but acts as our sales agent using commercially reasonable efforts consistent with its normal trading and sales practices. Shares sold pursuant to the Sales Agreement will be sold pursuant to the Shelf Registration Statement and will count towards the limit of the Baby Shelf Rule. Our common stock will be sold at prevailing market prices at the time of the sale, and as a result, prices may vary. As of December 31, 2022, the Company has not sold any shares of common stock pursuant to the Sales Agreement.

Strategic Transactions; Collaboration and Licensing Arrangement

In connection with our business development activities, we enter into collaborative and licensing arrangement with third parties, to use our licensed SEE-Tx® computational platform technology to discover novel allosteric sites on misfolded proteins and identify proprietary small molecules that bind these sites, potentially restoring protein folding and treating disease. We expect to continue to identify and evaluate collaboration, co-development and licensing opportunities that may be similar to or different from the collaboration and licenses arrangements that we have entered into.

Collaboration with Zentalis

On April 20, 2021, we entered into a multi-target collaboration agreement, or the Zentalis Agreement, with Zentalis Pharmaceuticals, Inc. ("Zentalis") to discover new product candidates for the treatment of cancer. Under the terms of the Zentalis Agreement, we have agreed to use our licensed SEE-Tx® computational platform technology to identify binding site on target proteins and determine the potential suitability of these sites as drug targets, as well as their prospective therapeutic use in oncology.

Zentalis has informed us of its desire to wind down the collaboration. Based on the results generated during the collaboration, we plan to independently continue the research activities with respect to the applicable target as one of our own internal programs.

Components of Our Consolidated Results of Operations

Revenue

We have not generated any revenue from product sales and do not expect to generate any revenue from the sale of products in the foreseeable future, if at all. If we fail to complete the development of our product candidates in a timely manner or fail to obtain their regulatory approval and successfully commercialize them, we will not generate revenues in the future. Our current revenue consists primarily of revenue from our Zentalis collaboration arrangement.

Operating Expenses

Our expenses since inception have consisted solely of research and development costs and general and administrative costs.

Research and Development Expenses

Research and development expenses consist primarily of costs incurred for our research activities, including our discovery efforts, and the development of our product candidates, which include:

- expenses incurred under collaborations with third parties, including contract research organizations ("CROs") and Universities, that conduct research and preclinical studies, such as in-vitro and in-vivo absorption, distribution, metabolism and excretion ("ADME"), cell model studies, in-vivo pharmacology and pharmacokinetic studies, toxicology studies and chemical synthesis, stability studies, manufacturing and control materials, process characterization, scale-up and transfer, on our behalf;

- employee salaries, benefits and other related costs, including share-based compensation expenses, for employees engaged in research and development functions and overhead allocations consisting of various support and facilities-related expenses, which include rent, utilities and maintenance of our Barcelona labs and Lugano office space, depreciation, travel and conference expenses;

- fees paid to consultants who assist with research and development activities and related travel expenses; and

- the cost of sponsored research, which includes laboratory materials and supplies, manufacturing scale-up expenses and the cost of acquiring and manufacturing preclinical studies.

The following table provides a breakout of our research and development expenses by major categories of expense:

	Year Ended December 31,		
	2022	2021	Change
Pre-clinical activities and outside services	5,192,868	4,849,576	343,292
Personnel expenses	2,969,038	2,223,585	745,453
Other	297,517	275,816	21,701
Research grants	(82,133)	(184,748)	102,615
Total research and development expenses	$ 8,377,290	$ 7,164,229	$ 1,213,061

We recognize research and development costs as incurred. We recognize external development costs based on an evaluation of the progress to completion of specific tasks using information provided to us by our vendors. Payments for these activities are based on the terms of the individual agreements, which may differ from the pattern of costs incurred, and are reflected in our financial statements as prepaid or accrued research and development expenses. We anticipate that our research and development expenses will increase substantially in future periods to support progress in our research and development activities, including the commencement of the clinical trials for product candidates we are developing. These increases will likely also result from increased headcount, expanded infrastructure and increased insurance costs.

Our primary research and development focus since inception has been the application of our in-licensed SEE-Tx® platform to various indications and targets. We are using our platform to generate a broad pipeline of product candidates.

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally incur higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. As a result, we expect that our research and development expenses will continue to increase in the foreseeable future as we (i) increase personnel costs, including stock-based compensation, (ii) continue preclinical development of our lead compounds, (iii) initiate clinical trials for certain product candidates, (iv) continue to discover and develop additional product candidates, and (v) pursue later stages of clinical development of product candidates.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries, bonus and other related costs, including share-based compensation, for personnel in our executive, finance, corporate and business development and administrative functions. General and administrative expenses also include legal fees relating to patent and corporate matters, professional fees for accounting, auditing, tax and consulting services, insurance costs, travel expenses, and facility-related expenses, and other operating costs.

We anticipate that our general and administrative expenses will increase in the future, in the form of additional compensation, including salaries, benefits, incentive arrangements and share-based compensation awards, as we increase our headcount to support the expected growth, attract and retain additional personnel and the potential commercialization of our product candidates. We also expect to incur increased expenses associated with being a public company, including increased costs of accounting, audit, legal, regulatory and tax-related services associated with maintaining compliance with exchange listing and SEC requirements, director and officer insurance costs and investor and public relations costs.

Other Financial Income (Expense)

Other financial income (expense) consists of interest income, interest expense and foreign exchange gain or loss, net.

Consolidated Results of Operations

Comparison of the Years Ended December 31, 2022 and 2021

The following table summarizes our results of operations for the periods indicated, together with the changes in those items in dollars.

	Year Ended December 31,		
	2022	2021	Increase (Decrease)
Revenues:			
Collaborative Agreements	132,640	133,928	(1,288)
Other income	7,468	31,066	(23,598)
Total revenues	$ 140,108	$ 164,994	$ (24,886)
Operating expenses:			
Research and development	(8,377,290)	(7,164,229)	1,213,061
General and administrative	(9,539,863)	(6,826,938)	2,712,925
Total operating expenses	$ (17,917,153)	$ (13,991,167)	$ 3,925,986
Loss from operations	$ (17,777,045)	$ (13,826,173)	$ 3,950,872
Interest income, net	375,357	12,495	362,862
Foreign exchange loss, net	(96,074)	(72,920)	(23,154)
Loss before income tax	$ (17,497,762)	$ (13,886,598)	$ 3,611,164
Income tax	(92,976)	(4,008)	88,968
Net loss	$ (17,590,738)	$ (13,890,606)	$ 3,700,132
Net loss per ordinary share:			
Basic and diluted loss per share	(1.48)	(1.37)	0.11
Weighted-average common stock used in per share calculations – basic and diluted	11,883,368	10,165,404	

Comparison of the Years ended December 31, 2022 and 2021

Revenues

For the years ended December 31, 2022 and 2021, total revenues were $140,108 and $164,994, respectively and consisted mainly of revenues from a collaboration agreement and other income related to subleasing our Lugano office space. Collaboration revenues were $132,640 and $133,928 as of December 31, 2022 and 2021, respectively, and refer to development services related to the first target development program identified under the Zentalis Agreement.

Research and Development Expenses

Research and development expenses increased by $1,213,061 to $8,377,290 for the year ended December 31, 2022, from $7,164,229 for the year ended December 31, 2021. The increase in research and development expenses for the year ended December 31, 2022 was primarily attributable to increases in external collaborations and external expenses, such as pre-IND clinical studies, quality and clinical manufacturing due to advancement of our GBA1 PD research programs into a development stage. The variance is also due to higher personnel-related costs resulting from an increase in employee headcount and stock-based compensation expenses. As of December 31, 2022, and 2021, research and development expenses are net of research grant of $82,133 and $184,748, respectively.

General and Administrative Expenses

General and administrative expenses increased by $2,712,925 to $9,539,863 for the year ended December 31, 2022 from $6,826,938 for the year ended December 31, 2021. The increase in general and administrative expenses for the year ended December 31, 2022 was primarily attributable to increases in expenses for legal fees relating to patent and corporate matters, professional fees for audit services, insurance and information technology as we continue to expand our business and build management infrastructure. The variance is also due to higher personnel-related costs resulting from an increase in employee headcount and stock-based compensation expenses.

Interest income, net

Interest income net increased by $362,862 to $375,357 for the year ended December 31, 2022 from $12,495 for the year ended December 31, 2021. The increase is due to interest income earned on the excess of cash invested in United States Treasury Securities.

Income tax

Income tax increased by $88,968 to $92,976 for the year ended December 31, 2022 from $4,008 for the year ended December 31, 2021. The increase is due to higher taxable profit realized by our Spanish subsidiary as a consequence of the allocation of non deductible tax expenses.

Liquidity and Capital Resources

Since our inception, we have not generated any revenue from product sales and have incurred significant operating losses and negative cash flows from our operations. We have not yet commercialized any products or technologies, and we do not expect to generate revenue from sales of any products in the near term, if at all. We have funded our operations to date primarily through a combination of sales of our securities and research grants.

We do not currently have any approved products and have never generated any revenue from product sales. To date, we have financed our operations primarily through the sale of equity securities and research grants. As of December 31, 2022, and 2021, we had $22.1 million and $36.9 million in cash and cash equivalents and marketable securities, respectively, and an accumulated deficit of $38.5 million and $20.9 million, respectively. We had indebtedness of $0.60 million and $0.69 million as of December 31, 2022 and 2021, respectively. We believe that our existing cash, cash equivalents and marketable securities will enable us to fund our operating expenses and capital expenditure requirements into the second quarter of 2024.

In May 2022, we filed a shelf registration statement on Form S-3, which covers the offering, issuance and sale of up to a maximum aggregate offering price of $100.0 million of any combination of our common stock, preferred

stock, debt securities and/or warrants from time to time in one or more offerings (the "Shelf Registration Statement"). We are currently subject to General Instruction I.B.6 to Form S-3 (the "Baby Shelf Rule"), and the amount of funds we can raise through primary public offerings of securities in any twelve-month period using our Shelf Registration Statement is limited to one-third of the aggregate market value of the voting and non-voting common equity held by non-affiliates. We will be limited by the Baby Shelf Rule until such time as our public float exceeds $75.0 million. As of December 31, 2022, the Company has not sold any securities pursuant to the Shelf Registration Statement.

In May 2022, we entered into a Controlled Equity Offering℠ Sales Agreement, or Sales Agreement with Cantor Fitzgerald & Co. ("Cantor"), pursuant to which we may offer and sell shares of our common stock having an aggregate offering price of up to $16.0 million from time to time through or to Cantor, acting as our agent or principal, in a series of one or more at-the-market equity offerings. Cantor is not required to sell any specific amount but acts as our sales agent using commercially reasonable efforts consistent with its normal trading and sales practices. Shares sold pursuant to the Sales Agreement will be sold pursuant to the Shelf Registration Statement and will count towards the limit of the Baby Shelf Rule. Our common stock will be sold at prevailing market prices at the time of the sale, and as a result, prices may vary. As of December 31, 2022, the Company has not sold any shares of common stock pursuant to the Sales Agreement.

Until such time, if ever, as we can generate substantial product revenues to support our business and corporate strategy, we expect to finance our cash needs through a combination of public and private equity offerings, debt financings, government or private party grants, collaborations, strategic alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our stockholders will be or could be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our stockholders. Debt financing and equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise funds through collaborations, or other similar arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us and/or may reduce the value of our common stock. We may not be able to obtain additional funds through equity or debt financings when needed on favorable terms or at all, including as a result of rising interest rates, recent and potential future bank failures, volatility in the capital markets and related market uncertainty. If we are unable to raise additional funds when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market our product candidates even if we would otherwise prefer to develop and market such product candidates ourselves.

Cash Flows

The following table provides information regarding our cash flows for the periods presented:

	Year Ended December 31,	
	2022	2021
Cash used in operating activities	$ (14,692,139)	$ (12,365,670)
Cash used in investing activities	(14,774,813)	(94,212)
Cash (used) / provided by financing activities	(78,774)	41,766,775
Net (decrease) / increase in cash, cash equivalents and restricted cash	$ (29,569,523)	$ 29,407,671

Cash Used in Operating Activities

During the year ended December 31, 2022, we used $14,692 thousand of cash in operating activities, primarily to fund our operations related to the development of our product candidates and related general and administrative support activities. Cash used in operating activities reflected our net loss of $17,591 thousand, which was partially offset by adjustments to reconcile net loss to cash used in operating activities of $1,384 thousand related mainly to stock-based compensation, depreciation and amortization, as well as a $1,515 thousand increase in cash flows resulting from changes in our operating assets and liabilities.

During the year ended December 31, 2021, we used $12,366 thousand of cash in operating activities, primarily to fund our operations related to the development of our product candidates and related general and

administrative support activities. Cash used in operating activities reflected our net loss of $13,891 thousand, which was partially offset by adjustments to reconcile net loss to cash used in operating activities of $1,855 thousand related to stock based compensation, depreciation, internal use-software and issuance of warrants, as well as a $330 thousand decrease in cash flows resulting from changes in our operating assets and liabilities.

Cash Used in Investing Activities

During the year ended December 31, 2022, cash used in investing activities was $14,775 thousand, primarily due to the purchase of marketable securities for $17,735 thousand and the purchase of computers and equipment for $119 thousand, offset by $3,079 thousand attributable to maturity of marketable securities.

During the year ended December 31, 2021, cash used in investing activities was $94 thousand primarily due to purchases of furniture, computers and lab instruments.

Cash Used/Provided by Financing Activities

During the year ended December 31, 2022, cash used by financing activities was $79 thousand related to the payment of the current portion of a long-term loan.

During the year ended December 31, 2021, cash provided by financing activities was $41,767 thousand, reflecting $42,630 thousand related to proceeds from the issuance of our common stock through the IPO, net of underwriter discounts and commissions, $12 thousand in proceeds from the exercise of stock options, offset by payment for offering costs of $853 thousand and payment of current portion of long-term debts for $22 thousand.

Funding Requirements

Our primary use of cash is to fund our operating expenses, which primarily consist of research and development expenditures. Cash used to fund operating expenses is impacted by the timing of when we pay these expenses, as reflected in the change in our outstanding accounts payable, accrued expenses and prepaid expenses.

Because of the numerous risks and uncertainties associated with research, development and commercialization of pharmaceutical products, we are unable to estimate the exact amount of our operating capital requirements. Our future funding requirements will depend on many factors, including, but not limited to:

- the scope, timing, progress and results of discovery, preclinical development, laboratory testing and clinical trials for our product candidates;
- the extent to which we enter into collaborations or other arrangements with additional third parties in order to further develop our product candidates;
- the extent to which we encounter increased costs as a result of global and macroeconomic conditions, including heightened inflation and rising interest rates, supply chain disruptions, fluctuating exchange rates, and increases in commodity, energy and fuel prices;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- the costs and fees associated with the discovery, acquisition or in-license of additional product candidates or technologies;
- our ability to establish additional collaborations on favorable terms, if at all;
- the costs required to scale up our clinical, regulatory and manufacturing capabilities;
- the costs of manufacturing our product candidates for clinical trials and in preparation for marketing approval and commercialization;

- the costs of future commercialization activities, if any, including establishing sales, marketing, manufacturing and distribution capabilities, for any of our product candidates for which we receive marketing approval; and

- revenue, if any, received from commercial sales of our product candidates, should any of our product candidates receive marketing approval.

We will need additional funding to meet our operational needs and capital requirements for our preclinical studies and clinical trials, other research and development expenditures, and business development activities. Because of the numerous risks and uncertainties associated with the development of our product candidates, we are unable to estimate the amounts of increased capital outlays and operating expenditures associated with our current and anticipated clinical trials.

We believe that our existing cash, cash equivalents and marketable securities will enable us to fund our operating expenses and capital expenditure requirements into the second quarter of 2024. We have based this estimate on assumptions that may prove to be wrong, and we could exhaust our available capital resources sooner than we expect.

Until such time, if ever, as we can generate substantial product revenue, we expect to finance our operations through a combination of equity offerings, debt financings, government or private party grants, collaborations, strategic alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, our stockholders' ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights as a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making acquisitions or capital expenditures or declaring dividends. If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or drug candidates, or grant licenses on terms that may not be favorable to us. We may not be able to obtain additional funds through equity or debt financings when needed on favorable terms or at all, including as a result of rising interest rates, volatility in the capital markets and related market uncertainty. If we are unable to raise additional funds when needed, we may be required to delay, limit, reduce or terminate our research, product development or future commercialization efforts, or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Critical Accounting Policies and Use of Estimates

Our management's discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these consolidated financial statements and related disclosures requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue, costs and expenses, and the disclosure of contingent assets and liabilities in our financial statements. We base our estimates on historical experience, known trends and events and various other factors that we believe are 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. On an ongoing basis, we evaluate our estimates and judgments, including those related to accrued expenses, defined benefit pension liability, share-based compensation and recognition of research grants. Our actual results may differ from these estimates under different assumptions or conditions. During the year ended December 31, 2022, there were no material changes to our critical accounting policies. While our significant accounting policies are described in more detail in Note 2 to our consolidated financial statements included elsewhere in this Annual Report, we believe the following accounting policies are the most critical to the judgments and estimates used in the preparation of our consolidated financial statements.

Accrued Expenses

As part of the process of preparing our financial statements, we are required to estimate our accrued expenses as of each balance sheet date. This process involves reviewing open contracts and purchase orders, communicating with our personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. We make estimates of our accrued expenses as of each balance sheet date based on facts and

circumstances known to us at that time at the date of the preparation of the financial statements. There may be instances in which payments made to our vendors exceed the level of services provided, and result in a prepayment reported under other current assets, which are subsequently expensed in the statement of operations when the related activity has been performed. To date, there have been no material differences between our estimates of accrued expenses reported at each balance sheet date and the amounts actually incurred.

Pension obligations

We operate defined benefit pension plans and defined contribution pension plans in accordance with local regulations and practices. These plans are funded by regular contributions made by the employer and the employees to a third-party. For defined benefit pension plans, the liability recognized in the balance sheets is the present value of the defined benefit obligation at the balance sheet date less the fair value of plan assets. The overfunded or underfunded status of the defined benefit plans is calculated as the difference between plan assets and the projected benefit obligations. Estimates are used in determining the assumptions incorporated in the calculation of the pension obligations, which is supported by input from independent actuaries. Actuarial gains and losses arising from experience adjustments and changes in actuarial assumptions are recognized in ''Accumulated Other Comprehensive Income (Loss)'' in the statements of equity and are charged or credited to income over the employees' expected average remaining working lives. The measurement date used for our employee defined benefit plan is December 31.

Share-based compensation

We recognize compensation costs related to equity based compensation granted to employees, consultants and directors, based on the estimated fair value of the awards as of the grant date. We estimate the grant date fair value, and the resulting share-based compensation, using the Black-Scholes option-pricing model. The grant date fair value of the stock based awards is recognized on a straight-line basis over the requisite service period, which is generally the vesting period of the respective awards. We estimate the fair value of stock options using the Black-Scholes option-pricing model, which requires assumptions, including the fair value of our common stock prior to our initial public offering, volatility, the expected term of exercise, the risk free interest rate for a period that approximates the expected term of exercise, and our expected dividend yield. Certain assumptions used in our Black-Scholes option-pricing model represent management's best estimates and involve a number of assumptions and the application of management's judgment, as they are inherently subjective.

Research Grants

Under the terms of the research and development grants awarded, we are entitled to receive reimbursement of our allowable direct expenses. Contributions from research and development activities under the grants are recorded based on management's best estimate of the periods in which the related expenditures are incurred and activities performed and are classified in the statement of operations as a reduction to research and development expenses.

JOBS Act

We qualify as an "emerging growth company", as defined in the JOBS Act. For so long as we remain an emerging growth company, we are permitted and plan to rely on exemptions from certain disclosure requirements that are applicable to public companies that are not emerging growth companies. These provisions include, but are not limited to: being permitted to report only two years of audited financial statements and only two years of related selected financial data and management's discussion and analysis of financial conditions and results of operations disclosure; an exemption from compliance with the auditor attestation requirement in the assessment of our internal control over financial reporting pursuant to Section 404 of the Sarbanes-Oxley Act; reduced disclosure obligations regarding executive compensation arrangements in our periodic reports, registration statements and proxy statements; and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. In addition, the JOBS Act permits emerging growth companies to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies. As a result, the information we provide might be different from the information that is available for other public companies. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock, and the market price of our common stock may be more volatile.

We will remain an emerging growth company until the earliest of (i) the last day of our first fiscal year in which we have total annual gross revenue of $1.07 billion or more, (ii) December 31, 2026, (iii) the date on which we

have issued more than $1.0 billion of non-convertible debt instruments during the previous three fiscal years or (iv) the date on which we are deemed a "large accelerated filer" under the rules of the SEC with at least $700 million of outstanding equity securities held by non-affiliates.

Recent Accounting Pronouncements

A description of recent accounting pronouncements that may potentially impact our financial position, results of operations or cash flows is disclosed in Note 2 to our audited financial statements included elsewhere in this Annual Report.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISKS

Under SEC rules and regulations, because we are considered to be a "smaller reporting company", we are not required to provide the information required by this item in this Annual Report

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Gain Therapeutics, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Gain Therapeutics, Inc. (the "Company") as of December 31, 2022 and 2021, the related consolidated statements of operations, comprehensive loss, stockholders' equity and cash flows for each of the two years in the period ended December 31, 2022, 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, 2022 and 2021, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2022, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young AG
We have served as the Company's auditor since 2020.
Lugano, Switzerland
March 23, 2023

Gain Therapeutics, Inc
Consolidated Balance Sheets

	December 31, 2022	December 31, 2021
Assets		
Current assets:		
Cash and cash equivalents	$ 7,311,611	$ 36,880,673
Marketable securities - current	12,826,954	—
Tax credits	103,877	113,586
Prepaid expenses and other current assets	848,854	727,785
Total current assets	$ 21,091,296	$ 37,722,044
Non-current assets:		
Marketable securities - non current	$ 1,941,488	$ —
Property and equipment, net	144,379	105,986
Internal-use software	213,967	202,609
Operating lease - right of use assets	659,933	901,042
Restricted cash	30,818	31,279
Long-term deposits and other non-current assets	17,506	22,111
Total non-current assets	3,008,091	1,263,027
Total assets	$ 24,099,387	$ 38,985,071
Liabilities and stockholder's equity		
Current liabilities:		
Accounts payable	$ 1,626,100	$ 560,479
Operating lease liability - current	229,080	219,137
Other current liabilities	2,106,756	1,402,600
Deferred income	55,180	266,504
Loans - current	108,135	103,826
Total current liabilities	$ 4,125,251	$ 2,552,546
Non-current liabilities:		
Defined benefit pension plan	$ 157,580	$ 329,458
Operating lease liability - non-current	441,784	695,053
Loans - non-current	495,258	590,468
Total non-current liabilities	1,094,622	1,614,979
Total liabilities	$ 5,219,873	$ 4,167,525
Stockholders' equity		
Preferred stock, $0.0001 par value; 10,000,000 shares authorized; nil shares issued and outstanding as of December 31, 2022 and 2021	$ —	$ —
Common stock, $0.0001 par value: 50,000,000 shares authorized; 11,883,368 issued and outstanding as of December 31, 2022 and December 31, 2021	1,189	1,189
Additional paid-in capital	57,358,895	55,832,461
Accumulated other comprehensive income / (loss)	35,627	(90,645)
Accumulated deficit	(20,925,459)	(7,034,853)
Loss of the period	(17,590,738)	(13,890,606)
Total stockholders' equity	18,879,514	34,817,546
Total liabilities and stockholders' equity	$ 24,099,387	$ 38,985,071

Gain Therapeutics, Inc
Consolidated Statement of Operations

	Year Ended December 31,	
	2022	2021
Revenues:		
Collaboration revenues	$ 132,640	$ 133,928
Other income	7,468	31,066
Total revenues	140,108	164,994
Operating expenses:		
Research and development	(8,377,290)	(7,164,229)
General and administrative	(9,539,863)	(6,826,938)
Total operating expenses	(17,917,153)	(13,991,167)
Loss from operations	(17,777,045)	(13,826,173)
Other income (expense):		
Interest income, net	375,357	12,495
Foreign exchange loss, net	(96,074)	(72,920)
Loss before income tax	$ (17,497,762)	$ (13,886,598)
Income tax	(92,976)	(4,008)
Net loss	$ (17,590,738)	$ (13,890,606)
Net loss per shares:		
Net loss per share attributable to common stockholders - basic and diluted	$ (1.48)	$ (1.37)
Weighted average common stock - basic and diluted	11,883,368	10,165,404

Gain Therapeutics, Inc
Consolidated Statement of Comprehensive Loss

	Year Ended December 31,	
	2022	2021
Net loss	$ (17,590,738)	$ (13,890,606)
Unrealized loss on available-for-sale marketable securities	(94,279)	—
Defined benefit pension plan	227,131	(101,780)
Foreign currency translation	(6,580)	163,833
Other comprehensive gain:	$ 126,272	$ 62,053
Comprehensive loss	$ (17,464,466)	$ (13,828,553)

Gain Therapeutics, Inc
Consolidated Statement of Changes in Stockholders' Equity

	Series A Preferred Stock		Series B Preferred Stock		Common Stock		APIC	AOCI	Accumulated	Total
	Shares	Amounts	Shares	Amounts	Shares	Amounts			Deficit	
Balance as of December 31, 2021		$ —		$ —	11,883,368	$ 1,189	$ 55,832,461	$ (90,645)	$ (20,925,459)	$ 34,817,546
Stock-based compensation expense		—		—		—	1,526,434	—	—	1,526,434
Defined benefit pension plan		—		—		—	—	227,131	—	227,131
Foreign currency translation		—		—		—	—	(6,580)	—	(6,580)
Net unrealized gain on available for sale securities		—		—		—	—	(94,279)	—	(94,279)
Net loss		—		—		—	—	—	(17,590,738)	(17,590,738)
Balance as of December 31, 2022	—	—	—	—	11,883,368	1,189	57,358,895	35,627	(38,516,197)	18,879,514

	Series A Preferred Stock		Series B Preferred Stock		Common Stock		APIC	AOCI	Accumulated	Total
	Shares	Amounts	Shares	Amounts	Shares	Amounts			Deficit	
Balance as of December 31, 2020	1,185,879	$ 118	2,965,600	$ 297	3,543,163	$ 354	$ 13,388,771	$ (152,698)	$ (7,034,853)	$ 6,201,989
Conversion of Series A Preferred Stock into Common Stock	(1,185,879)	(118)		—	1,185,879	118	—	—	—	—
Conversion of Series B Preferred Stock into Common Stock		—	(2,965,600)	(297)	2,965,600	297	—	—	—	—
Issuance of Common Stock in IPO, net of issuance costs		—		—	4,181,818	419	40,558,103	—	—	40,558,522
Issuance of Common Stock due to warrants cashless exercise		—		—	3,283	—	—	—	—	—
Issuance of Common Stock due to stock option exercise		—		—	3,625	1	12,216	—	—	12,217
Stock-based compensation expense		—		—		—	839,371	—	—	839,371
Issuance of warrants		—		—		—	1,034,000	—	—	1,034,000
Defined benefit pension plan		—		—		—	—	(101,780)	—	(101,780)
Foreign currency translation		—		—		—	—	163,833	—	163,833
Net loss		—		—		—	—	—	(13,890,606)	(13,890,606)
Balance as of December 31, 2021	—	—	—	—	11,883,368	1,189	55,832,461	(90,645)	(20,925,459)	34,817,546

Gain Therapeutics, Inc
Consolidated Statement of Cash Flows

	Year Ended December 31,	
	2022	2021
Operating activities:		
Net loss	$ (17,590,738)	$ (13,890,606)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	64,168	15,484
Stock based compensation expense	1,526,434	839,371
Other non cash items	(206,861)	—
Issuance of warrants	—	1,034,000
Internal-use software	—	(34,135)
Changes in operating assets and liabilities:		
Account receivables	—	8,264
Prepaid expenses and other currents assets	(114,005)	(534,502)
VAT credits	3,631	(71,618)
Long term deposit and other non current assets	(2,901)	33,979
Accounts payable	1,066,707	(521,394)
Other current liabilities	711,073	665,460
Defined benefit pension plan	58,696	55,326
Deferred income	(208,343)	34,701
Total changes in operating assets and liabilities	1,514,858	(329,784)
Net cash used in operating activities	(14,692,139)	(12,365,670)
Cash flows from investing activities:		
Purchase of property and equipment and internal-use of software	(118,953)	(94,212)
Purchases of marketable securities	(17,735,355)	—
Maturities of marketable securities	3,079,495	—
Net cash used in investing activities	(14,774,813)	(94,212)
Cash flow from financing activities:		
Proceeds from issuance of common shares upon completion of initial public offering, net of underwriter discounts	—	42,629,998
Payments of deferred offering costs	—	(853,488)
Payments of current portion of long-term debt	(78,774)	(21,951)
Proceeds from stock option exercise	—	12,216
Net cash (used) / provided by financing activities	$ (78,774)	$ 41,766,775
Effect of exchange rate changes	(23,797)	100,778
Net (decrease) / increase in cash, cash equivalents and restricted cash	$ (29,569,523)	$ 29,407,671
Cash, cash equivalents and restricted cash at beginning of period	36,911,952	7,504,281
Cash, cash equivalents and restricted cash at end of period	$ 7,342,429	$ 36,911,952
Supplemental Data:		
Income taxes paid	2,740	4,469

Notes to the Consolidated Financial Statements

1. Nature of the business and basis of presentation

Operations and business

Gain Therapeutics, Inc. (and together with its subsidiary, the "Company"), was incorporated under the laws of the state of Delaware (U.S.) on June 26, 2020. On July 20, 2020, the Company consummated a corporate reorganization, pursuant to which all of the issued and outstanding common and preferred stock of GT Gain Therapeutics SA, a Swiss company formed in 2017, were exchanged for common stock or preferred stock, as applicable, of Gain Therapeutics, Inc., reflecting a 10:1 stock split. The corporate reorganization was accounted for as a recapitalization for accounting purposes, with GT Gain Therapeutics SA resulting in the predecessor entity of the Company. As a result of the corporate reorganization, GT Gain Therapeutics SA became a wholly-owned subsidiary of Gain Therapeutics, Inc.

On March 17, 2021, the Company's registration statement on Form S-1 related to its Initial Public Offering ("IPO") was declared effective by the Securities and Exchange Commission ("SEC"). In conjunction with the IPO the Company completed a reverse stock split of the Company's outstanding equity instruments. The reverse stock split was approved by the stockholders on March 4, 2021 and became effective on March 17, 2021. Upon closing of the IPO, the Series A and the Series B Preferred Stock, as resulting from the reverse stock split, were converted to common stock at a ratio of 1-for-1.

The Company is a biotechnology company developing novel small molecule therapeutics to treat diseases across several therapeutic areas, including central nervous system ("CNS") disorders, lysosomal storage disorders ("LSDs"), metabolic disorders, and other diseases that can be targeted through protein degradation, such as oncology. The Company uses its exclusively in-licensed computational target and drug discovery platform, Site-Directed Enzyme Enhancement Therapy ("SEE-Tx®"), to discover novel allosteric binding sites on proteins implicated in a disease and to identify proprietary small molecules that bind these sites to modulate protein function and treat the underlying cause of the disease.

Risks and uncertainties

The Company is subject to risks and uncertainties common to early-stage companies in the biotechnology industry, including, but not limited to, risks associated with completion and success of preclinical studies and clinical testing, dependence on key personnel, protection of proprietary technology, compliance with applicable governmental regulations, development by competitors of new technological innovations, protection of proprietary technology and the ability to secure additional capital to fund operations. Drug candidates currently under development will require significant additional research and development efforts, including preclinical and clinical testing and prior to regulatory approval and commercialization. These efforts require significant amounts of additional capital, adequate personnel, and infrastructure and extensive compliance-reporting capabilities. Even if the Company's drug development efforts are successful, it is uncertain when, if ever, the Company will realize revenue from product sales.

Going concern

The Company has incurred recurring losses and negative cash flows from operations since its inception and has primarily funded these losses through proceeds from capital contributions and from its initial public offering. The Company anticipates incurring additional losses until such time, if ever, that it can generate significant sales of its product candidates currently in development. Substantial additional capital will be needed by the Company to fund its operations and to develop its product candidates.

In March 2021, the Company closed its initial public offering, or IPO, in which the Company issued and sold 4,181,818 shares of its common stock, which included shares sold pursuant to an option granted to the underwriters to purchase additional shares, at a public offering price of $11.00 per share for net proceeds of $40.5 million after deducting underwriting discounts, commissions and other offering expenses.

The Company's operations have consisted primarily of organizing the Company, securing financing, developing licensed technology, performing research and conducting preclinical studies. The Company faces risks associated with early-stage biotechnology companies whose product candidates are in development. Product

candidates currently under development will require significant additional research and development efforts, including extensive preclinical and clinical testing, establishing manufacturing capacity and regulatory approval prior to commercialization. These efforts require significant amounts of additional capital for the Company to complete its research and development objectives, defend its intellectual property rights, and recruit and retain skilled personnel, and key members of management. Even if the Company's product development efforts are successful, it is uncertain when, if ever, the Company will realize revenue from product sales.

The Company plans to seek additional funding through public or private equity offerings, debt financings, other collaborations, strategic alliances and licensing arrangements. The Company may not be able to obtain financing on acceptable terms, or at all, and the Company may not be able to enter into strategic alliances or other arrangements on favorable terms, or at all. The terms of any financing may adversely affect the holdings or the rights of the Company's stockholders. If the Company is unable to obtain funding, the Company could be required to delay, reduce or eliminate research and development programs, product portfolio expansion or future commercialization efforts, which could adversely affect its business prospects.

In accordance with Accounting Standards Update, or "ASU", No. 2014-15, Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern, the Company has evaluated whether there are certain conditions and events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern within one year after the date that the financial statements are issued. As of the issuance date of these financial statements, the Company expects that its cash and cash equivalents will be sufficient to fund its forecasted operating expenses and capital expenditure requirements for at least the next twelve months. Accordingly, the consolidated financial statements have been prepared assuming that the Company will continue as a going concern.

Basis of presentation

The consolidated financial statements reflect the accounts of the Gain Therapeutics, Inc., GT Gain Therapeutics SA and its wholly owned branch, Gain Therapeutics Sucursal en España. All intercompany transactions and balances have been eliminated in the preparation of the consolidated financial statements. The consolidated financial statements as of December 31, 2022, represented by the Consolidated Balance Sheet, the Consolidated Statement of Operations, the Consolidated Statements of Changes in Shareholders' Equity, the Consolidated Statement of Comprehensive Loss, the Consolidated Statements of Cash Flows and the accompanying Notes, have been prepared in accordance with accounting principles generally accepted in the United States of America ("US GAAP"). Any reference in these notes to applicable guidance is meant to refer to the authoritative United States generally accepted accounting principles as found in the Accounting Standards Codification ("ASC") and Accounting Standards Update ("ASU") of the Financial Accounting Standards Board ("FASB").

The financial statements as of December 31, 2022 reflect, for all periods presented, the retroactive application of the reverse stock split that occurred on March 17, 2021. All amounts in the consolidated financial statements are expressed in United States Dollars (USD/$) and disclosed within these explanatory notes in United States Dollars (USD/$) or Swiss Franc (CHF), which are the functional currencies of the Company and its operating subsidiary, GT Gain Therapeutics SA, respectively.

The consolidated financial statements have been prepared on the same basis as the audited annual consolidated financial statements as of and for the year ended December 31, 2021, and, in the opinion of management, reflect all adjustments, consisting of normal recurring adjustments, necessary for the fair presentation of the Company's financial position as of December 31, 2022 and 2021, and the results of its operations, its statements of stockholders' equity and its statements of cash flows for the years then ended.

Reverse Stock Split

On March 3, 2021, the Board approved a 1-for-0.880784 reverse stock split of the Company's outstanding equity instruments. The reverse stock split was approved by the stockholders on March 4, 2021 and became effective in conjunction with the IPO on March 17, 2021. Stockholders were not entitled to fractional shares as a result of the reverse stock split. All share and per share data shown in the accompanying consolidated financial statements and related notes have been retroactively revised to reflect the reverse stock split. Shares of common stock underlying outstanding stock options and other equity instruments were proportionately reduced and the respective exercise prices, if applicable, were proportionately increased in accordance with the terms of the agreements governing such securities.

Initial Public Offering

On March 17, 2021, the Company's registration statement on Form S-1 relating to its IPO was declared effective by the Securities and Exchange Commission ("SEC"). The IPO closed on March 17, 2021 and the Company issued and sold 3,636,364 common shares at a public offering price of $11.00 per share for net proceeds of $34,978 thousand after deducting underwriting discounts and commissions of $2,950 thousand and other offering expenses of $2,071 thousand. Also on March 22, 2021, the Company issued and sold 545,454 additional common shares, pursuant to the full exercise of the underwriters' option to purchase additional shares, for net proceeds of $5,580 thousand after deducting underwriting discounts and commissions of $420 thousand. Thus, the aggregate net proceeds to the Company from the IPO, after deducting underwriting discounts commissions, were $42,630 thousand. After deducting other IPO offering expenses amounting to $2,071 thousand, the net cash proceeds resulting from the IPO were $40,558 thousand, which are reflected in the statement of stockholders' equity as Issuance of Common Stock in IPO, net of issuance costs. Upon the closing of the IPO, series A convertible preferred stock (the "Series A Preferred Stock") and series B convertible preferred stock (the "Series B Preferred Stock", and together with the Series A Preferred Stock, are collectively referred to as the "Preferred Stock") were converted into shares of common stock at ratio of 1-for-1.

Segment information

Operating segments are defined as components of an enterprise for which separate discrete information is available for evaluation by the chief operating decision-maker in deciding how to allocate resources and assess performance. The Company's chief operating decision-maker, the Chief Executive Officer, oversees the Company's operations and manages the business as a single operating segment, which is research and development in the pharmaceutical sector with a focus on developing novel therapeutics to treat diseases caused by protein misfolding, such as rare genetic diseases and neurological disorders. Geographically, the research and development activities are mainly performed in Switzerland and Spain. The Company does not consider these geographies to be separate segments.

2. Summary of significant accounting policies

Foreign currency translation

The Company is incorporated in the United States of America and has operations in Switzerland and Spain. The Company's functional currency is USD. The functional currencies of the Company's foreign operations are the local currencies (Swiss Franc in Switzerland and Euro in Spain). Assets and liabilities reported in the consolidated balance sheets are translated into U.S. dollars (the currency in which these financial statements are presented) at the exchange rates applicable at the balance sheet dates and for the consolidated statement of operations at the average exchange rates for the periods presented. Items representing the share capital and additional paid-in capital are presented at the historical exchange rates. Adjustments resulting from the translation of the financial statements of the Company's foreign operations into U.S. dollars are excluded from the determination of net income and are recorded in accumulated other comprehensive income/(loss), a separate component of shareholders' equity. The Company has not utilized any foreign currency hedging strategies to mitigate the effect of its foreign currency exposure. As of December 31, 2022 and 2021, accumulated currency translation adjustment recorded in the accumulated other comprehensive loss amounted to $158,576 and $165,156, respectively.

Use of Estimates

The preparation of our consolidated financial statements in conformity with US GAAP requires management to make estimates, judgments and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenue and expenses during the reporting periods. On an ongoing basis, we evaluate our estimates judgments and, assumptions including those related to recognition of accrued expenses, defined benefit pension liability, share-based compensation, and recognition of research grants. These estimates and assumptions are based on current facts, historical experience and various other factors believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities and the recording of expenses that are not readily apparent from other sources. Actual results may differ materially and adversely from these estimates. Changes in estimates are recorded in the period in which they become known. To the extent that material differences arise between the estimates and actual results, the Company's future results of operations will be affected.

Cash and cash equivalents

The Company reports cash on hand and held at banks, and all highly liquid investments in money market, certificates of deposit, time deposit, and other short-term liquid securities with original maturities of less than 90 day, as cash and cash equivalents.

Marketable Securities

The Company classifies marketable securities as held-to-maturity or available-for-sale at the time these instruments are purchased, based on the requirements of ASC 320.

Marketable securities are classified as held-to-maturity when the Company has the positive intent and the capacity to hold the marketable securities until the maturity date. Held-to-maturity marketable securities are carried out at amortized cost, with the accretion of discount (or amortization of premiums) included within the calculation of the effective interest method. The effective interest of the period is accounted for in the Company's statements of operations as financial income (or expense).

Marketable securities are classified as available-for-sale when the Company does not have the positive intent and the capacity to hold the marketable securities until the maturity date. Available-for-sale marketable securities are carried out at fair value with the "unrealized gains/loss" excluded from the computation of the earnings of the period and accounted for in other comprehensive income. The accretion of discounts (or amortization of premiums) are accounted for in the Company's statements of operations as financial income (or expense).

Marketable securities are classified in the Company's balance sheet based on their maturities and the Company's reasonable expectation with regard to those securities. Marketable securities with a maturity date within 12 months from reporting date are classified as "current assets". Marketable securities with a maturity date over 12 months from reporting date are classified as "non-current assets".

Concentrations of credit risk

The Company has no significant off-balance sheet risk, such as foreign exchange contracts, option contracts, or other foreign hedging arrangements. Financial instruments that may expose the Company to concentrations of credit risk consist primarily of cash and cash equivalents which are deposited in accredited financial institutions in excess of federally insured limits. The Company deposits its cash and cash equivalents in financial institutions that it believes have high credit quality and has not experienced any losses on such accounts and does not believe it is exposed to any unusual credit risk beyond the normal credit risk associated with commercial banking relationships.

Property and equipment

Property and equipment are stated at cost, including any accessory and direct costs that are necessary to make the assets fit for use, and adjusted by the corresponding accumulated depreciation. The depreciation expenses are recorded using the straight-line method in the consolidated financial statements of operations and have been calculated by taking into consideration the use, purpose and financial-technical duration of the assets, on the basis of their estimated useful economic lives. The Company believes the above criteria to be represented by the following depreciation rates:

-	Equipment & Furniture	12.5 %
-	Electronic office equipment:	20 %
-	Leasehold Improvements	based on the terms of the lease
-	Laboratory equipment:	15 %

Ordinary maintenance costs are entirely attributed to the consolidated statements of operations in the year in which they are incurred. Extraordinary maintenance costs, the purpose of which is to extend the useful economic life of the asset, to technologically upgrade it and/or to increase its productivity or safety for the purposes of the economic productivity of the Company, are attributed to the asset to which they refer and depreciated on the basis of its estimated useful economic lives. Amortization of leasehold improvements is computed using the straight-line method based upon the terms of the applicable lease or estimated useful life of the improvements, whichever is lower.

Capitalized Software Development Costs

The Company capitalizes the costs of software obtained for internal use in accordance with ASC 350-40, Internal-Use Software. Capitalized software development costs consist of costs incurred during the development stage and include purchased software licenses, implementation costs, consulting costs, and payroll-related costs for projects that qualify for capitalization. All other costs, primarily related to maintenance and minor software fixes, are expensed as incurred. As of December 31, 2022 and 2021, internal-use software amount to $213,967 and $202,609, respectively, and refer to the external and internal labor costs incurred in the development of the Company's enterprise resource planning system. The additions of capitalized software for the current year amount to $46,382.

The Company amortizes the capitalized software development costs on a straight-line basis over the estimated useful life of the software, which is generally six years, beginning when the asset is substantially ready for use. The amortization of capitalized software development costs is reflected in general and administrative expenses. Amortization expense for the years ended December 31, 2022 and 2021 was $37,536 and nil, respectively.

Impairment of long-lived assets

In accordance with ASC Topic 360-10-20, "Property, Plant and Equipment," the Company performs an impairment test whenever events or circumstances indicate that the carrying value of long-lived assets with finite lives may be impaired. Impairment is measured by comparing the carrying value of the long-lived assets to the estimated undiscounted pre-tax cash flows expected to result from the use of such assets and their ultimate disposition. In circumstances where impairment is determined to exist, the Company will write down the asset to its fair value based on the present value of estimated cash flows. No impairments have been identified by management as of and for any periods presented.

Patents

Patent-related costs, refer to legal fees incurred in connection with filing and prosecuting patent applications and are expensed as incurred due to uncertainty about the recovery of the expenditure. Amounts incurred are classified as general and administrative expenses.

Leases

The Company determines if an arrangement contains a lease at inception based on whether or not the Company has the right to control the asset during the contract period and other facts and circumstances as per ASC 842. Operating lease right of use ("ROU") assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent the obligation to make lease payments arising from the lease, both of which are recognized based on the present value of the future minimum lease payments over the lease term at the commencement date. Leases with a term of 12 months or less at inception are expensed on a straight-line basis over the lease term in the consolidated statement of operations. The Company determines the lease term by assuming the exercise of renewal options that are reasonably certain.

Accounts Payable

Accounts payable are reported at their nominal amounts due to their short-term maturities. Trade accounts payable are recorded net of trade discounts; cash discounts are recorded at the time of payment.

Payables for Social Security Charges

Social Security charges are reported in compliance with rules and laws applicable in the countries where our employees work. Charges are accrued in accordance with the policies stipulated and in connection with salaries due for the period.

Accrued expenses

As part of the process of preparing the Company's consolidated financial statements, the Company is required to estimate its accrued expenses as of each balance sheet date. This process involves reviewing open contracts and purchase orders, communicating with the Company personnel to identify services that have been performed on its

behalf and estimating the level of service performed and the associated cost incurred for the service when the Company has not yet been invoiced or otherwise notified of the actual cost. The Company makes estimates of its accrued expenses as of each balance sheet date based on facts and circumstances known at the time of the preparation of its consolidated financial statements. There may be instances in which payments made to the Company's vendors exceed the level of services provided, and result in a prepayment reported under other current assets, which is subsequently expensed in the consolidated statement of operations when the related activity has been performed. To date, there have been no material differences between the Company's estimates of accrued expenses reported at each balance sheet date and the amounts actually incurred.

Pension obligations

The Company operates defined benefit pension plan and defined contribution pension plans in accordance with local regulations and practices in the countries in which the Company operates. These plans are funded by regular contributions made by the Company and its employees. For the defined benefit pension plan, the liability recognized in the consolidated balance sheets is the present value of the defined benefit obligation at the balance sheet date less the fair value of plan assets. The overfunded or underfunded status of the defined benefit plan is calculated as the difference between plan assets and the projected benefit obligations. Estimates are used in determining the assumptions incorporated in the calculation of the pension obligations, which is supported by input from independent actuaries. Actuarial gains and losses arising from experience adjustments and changes in actuarial assumptions are recognized in the consolidated statements of equity under accumulated other comprehensive income (loss), and are charged or credited to income over the employees' expected average remaining working lives. The measurement date used for the Company's employees defined benefit plan is December 31.

For defined contribution pension plans, the Company pays contributions to publicly or privately administered pension insurance plans on a mandatory, contractual or voluntary basis. The Company has no further payment obligations once the contributions have been paid. The contributions are recognized as employee benefit expense when they are due.

Equity-based Compensation and Warrants

The Company applies the fair value method of measuring equity-based compensation and warrants, which requires an entity to measure the cost of services received in exchange for an award of equity instruments based on the grant-date fair value of the award.

The Company issues equity-based compensation with service-based vesting conditions and records the expense for these awards using the straight-line method. The Company recognizes the related costs in the consolidated statement of operations and as additional paid-in capital in the consolidated statement of shareholders' equity, in accordance with the vesting period during which the award recipients are required to provide services in exchange for the award. The Company accounts for forfeitures as they occur.

Before becoming a public company, given the absence of an active market for the Company's common stock, the Company and its Board of Directors estimated the fair value of the Company's common stock at the grant date for determining the estimated fair value of the Company's equity instruments based on a number of factors, including prices paid for the Company's convertible preferred stock sold to outside investors in arm's-length transactions, the Company's stage of development and the fact that the grants of stock-based awards involved illiquid securities in a private company.

The fair value of each stock option award is estimated on the date of grant using the Black-Scholes option pricing model. Given the absence of an active public market for the Company's common stock prior to March 18, 2021, which was the first day the Company's common stock began trading on the Nasdaq Global Market ("Nasdaq"), the Company determined the volatility and the expected term for awards granted based on an analysis of reported data for a peer group of similar biopharmaceutical companies that issued options with substantially similar terms. After the IPO, the Company continues to determine its volatility in the same manner, and it expects not to change its methodology until such time as the Company has reliable historical data regarding the volatility of the Company's traded stock price and expected term of exercise patterns. The risk-free interest rate is determined by reference to the U.S. Treasury yield curve in effect at the time of grant of the award for time periods approximately equal to the expected term of the award. The Company has not paid, and does not anticipate paying, cash dividends on its common stock; therefore, the expected dividend yield is assumed to be zero.

The Black-Scholes option pricing model is also used for the warrants issued, using consistent inputs and methodology to quantify such inputs, as described above in relation to equity-based compensation.

The assumptions used in calculating the fair value of share-based awards and warrants represent management's best estimates and involve inherent uncertainties and the application of management's judgment.

The fair market value for RSUs is based on the closing price of our stock on the grant date. We recognize expenses related to RSUs based on the fair market value, as determined on the grant date, on a straight line basis over the requisite service period for the entire award. Forfeitures are recognized as they occur.

Revenue Recognition

The Company derives limited revenue from its collaboration and licensing agreements. The Company recognizes revenue related to these agreements in accordance with ASC 606, "Revenues from Contracts with Customers" and ASC 808, "Collaborative Arrangements". The terms of these arrangements typically include payment from third-party customers of one or more of the following: non-refundable initiation fee, reimbursement of development costs, future development and regulatory milestone payments and royalties on net sales of the licensed product.

In determining the appropriate amount of revenue to be recognized as we fulfill our obligations, the Company applies the five-step model of ASC606: (i) identify the contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) it satisfies a performance obligation. The Company only applies the five-step model to contracts when it is probable that the entity will collect the consideration it is entitled to in exchange for the goods and services it transfers to the customer. If a contract is determined to be within the scope of ASC 606 at inception, the Company assesses the goods or services promised within such contract, determines which of those goods and services are performance obligations, and assesses whether each promised good or service is distinct. The Company then recognizes as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

Costs and revenues associated with collaborative arrangements are reported in the consolidated statements of operations on a gross basis when the counterpart is identified as being a customer, when the performance obligations incurred and rendered to fulfil the agreements are deemed to be in the ordinary course of the Company's business, or when there is an expectation that the collaborative arrangement will result in a future constant flow of revenues in the form of sales of products, royalties or licenses.

Research grants

Under the terms of the research and development grants awarded, the Company is entitled to receive reimbursement of its allowable direct expenses and payroll costs. Contributions from research and development activities under the grants are recorded based on management's best estimate of the periods in which the related expenditures are incurred and activities performed and are classified in the consolidated statement of operations as a reduction to research and development expenses.

Research and development expenses

The Company expenses all costs incurred in performing research and development activities. Research and development expenses include salaries and other related costs, materials and supplies, preclinical expenses, manufacturing expenses, contract services and other third-party expenses.

General and administrative expenses

General and administrative expenses consist primarily of salaries, benefits and other related costs, for personnel and consultants in the Company's executive and finance functions. General and administrative expenses also include professional fees for legal, finance, accounting, intellectual property, auditing, tax and consulting services, travel expenses and facility-related expenses, which include allocated expenses for rent and maintenance of facilities and other operating costs not otherwise included in research and development expenses.

Income taxes

The Company accounts for income taxes under the liability method. Under this method deferred income tax liabilities and assets are determined based on the difference between the financial statements carrying amounts of assets and liabilities and the related tax basis using enacted tax rates in effect in the years in which the associated deferred taxes are expected to reverse. A valuation allowance is recorded if it is "more likely than not" that a portion or all of a deferred tax asset will not be realized.

As of each reporting date, the Company considers existing evidence, both positive and negative, that could impact its view with regard to future realization of deferred tax assets. In consideration of the start-up status of the Company, a full valuation allowance has been established to offset the deferred tax assets, as the related realization is currently uncertain. In the future, should management conclude that it is more likely than not that the deferred tax assets are partially or fully realizable, the valuation allowance will be reduced to the extent of such expected realization, and the corresponding amount will be recognized as income tax benefit in the Company's consolidated statement of operations.

Fair value measurements

The Company defines fair value as the price that would be received from selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The Company applies the following fair value hierarchy, which prioritizes the inputs used to measure fair value into three levels based on their observability in the market and degree of judgment involved:

- Level 1 – Quoted prices in active markets for identical assets or liabilities.
- Level 2 – Observable inputs other than quoted prices in active markets for identical assets and liabilities, quoted prices for identical or similar assets or liabilities in inactive markets, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.
- Level 3 – Inputs that are generally unobservable and typically reflect management's estimates of assumptions that market participants would use in pricing the asset or liability.

In determining fair value, we utilize valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible and consider counterparty credit risk in their assessment of fair value.

Comprehensive income/(loss)

Comprehensive income/(loss) is composed of net income/(loss) and certain changes in stockholder's equity that are excluded from the net income/(loss), primarily foreign currency translation adjustments, defined benefit obligation adjustments and unrealized income/(loss) on available for sale securities.

Net loss per share

Basic net loss per share is computed by dividing the reported net loss by the weighted average number of shares of common stock outstanding during the period. The Company gives consideration to all potentially dilutive impacts, except where the effect of including such securities would be antidilutive. As of December 31, 2022, common stock equivalents consisted of stock options, RSUs, PRSUs and warrants, while as of December 31, 2021, common stock equivalents consisted of stock options and warrants. Because the Company has reported net losses since inception, these potential impacts would be anti-dilutive, and therefore common stock equivalents have been excluded from the computation, resulting in basic and diluted net loss per share being the same for all periods presented.

COVID-19 Pandemic

In regard to the ongoing COVID-19 global pandemic, the Company has taken measures to secure its research and development activities, while work in its laboratories and facilities has been re-organized to reduce risks of COVID-19 transmission. Given the global impact and the other risks and uncertainties associated with the COVID-19 pandemic, the Company's business, financial condition and results of operations could be materially adversely

affected. The Company continues to closely monitor the COVID-19 pandemic and evolve its business continuity plans, clinical development plans and response strategy to mitigate any potential impact. As of the date of issuance of these financial statements, the Company is not aware of any specific event or circumstance that would require the Company to update its estimates, assumptions and judgments or revise the carrying value of its assets or liabilities. Actual results could differ from those estimates, and any such differences may be material to the Company's financial statements.

Recently issued accounting pronouncements

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board (FASB) or other standard setting bodies that the Company adopts as of the specified effective date. There were no new material accounting pronouncements issued in fiscal year 2022 with a material impact on the Company's consolidated financial statements.

3. Research Grants

During the course of its business, the Company applies for research grants with public or private organization to funds is research projects. Under the terms of these grants , the Company is entitled to receive reimbursement of its allowable direct research expenses.

In July 2019, the Company's wholly owned subsidiary, GT Gain Therapeutics SA, announced that, in a consortium with the Institute for Research in Biomedicine, Bellinzone (Switzerland) and Neuro-Sys SAS in Gardanne (France), it obtained a three-years research grant to support the development of the drugs portfolio for the treatment of Gaucher Disease, GM1 Gangliosidosis, Mucopolysaccharidosis type 1 and Krabbe.The grant was approved by the Eurostars-2 joint programme, with co-funding from the European Union Horizon 2020 research and Innosuisse – Swiss Innovation Agency. As of December 31, 2022 and 2021, the Company recorded as reductions to research and development expenses USD 82,133 and USD 184,748, respectively and receivables of USD 87,430 and USD 81,862, respectively.

4. Cash, cash equivalents and restricted cash

The Company considers all short-term, highly liquid investments, with an original maturity of three months or less, to be cash equivalents. The Company's cash and cash equivalents include short-term highly liquid investments which are readily convertible into cash. These investments relate to money market securities with maturities of three months or less when acquired. The Company's institutional money market accounts permit daily redemption and the fair values of these investments are based upon the quoted prices in active markets provided by the holding financial institutions, which are considered Level 1 inputs in the fair value hierarchy (see Note 13). Given their short-term maturities and the underlying being represented by cash equivalents, their face value amount approximate the related fair market value.

The Company has not experienced any losses in these accounts and does not believe it is exposed to any significant credit risk on cash and cash equivalents.

Cash, cash equivalents and restricted cash are broken down as follows:

	December 31, 2022	December 31, 2021
Cash	2,910,446	3,262,977
Money Market	4,401,165	33,617,696
Total cash and cash equivalents	$ 7,311,611	$ 36,880,673
Restricted cash	$ 30,818	$ 31,279

Restricted cash refers to an amount required under our Lugano new office lease agreement and deposited into a restricted bank account as a guarantee for expenses to be incurred in case of damage to the premises noted at the termination of the lease.

Details of the cash and cash equivalents balances as of December 31, 2022 and 2021, broken down by currency in which the funds are denominated, are reported in the following table:

	December 31, 2022	December 31, 2021
Cash in CHF	363,948	157,310
Cash in EUR	781,363	338,766
Cash in GBP	79,844	-
Cash in USD	5,985,858	36,322,777

5. Marketable Securities

As of December 31, 2022 the Company reports $ 14,768 thousand of marketable securities, related to United States Treasury Securities ("USTS"), within current and non-current assets. The USTS purchased have maturity dates going from January 2023 to February 2024, on a monthly basis, in tranches of USD 1,000 thousand each month. The Company classifies the USTS, which are accounted for as available-for-sale, within the Level 1 fair value hierarchy category as the fair value is based on quoted market prices in active markets with a high level of daily trading volume.

The following table summarizes the Company's investment in available-for-sale marketable securities with the detail of the unrealized gains / (losses) and the estimated fair value as of December 31, 2022:

	December 31, 2022				
	Amortized Cost	Allowance for Credit Losses	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Marketable securities available for sale					
Debt Securities - U.S. government treasury securities, current	12,919,792	—	—	(92,838)	12,826,954
Debt Securities - U.S. government treasury securities, non current	1,942,929	—	—	(1,441)	1,941,488
Totals	$ 14,862,721	$ —	$ —	$ (94,279)	$ 14,768,442

The Company regularly reviews the securities in an unrealized loss position and evaluates the current expected credit loss by considering factors such historical experience, market data, the financial condition and near term prospects of the investee, the extent of the loss related to credit of the issuer, the expected cash flows from the security, the Company's intent to sell the security, and whether or not the Company will be required to sell the security before the recovery of its amortized cost.

As of December 31, 2022 the Company did not intend to sell any of the debt securities included in the table above, and it is not "more likely than not" that the Company will be required to sell any of these securities before the recovery of the unrealized losses, which will be at maturity. Unrealized losses on available-for-sale debt securities as of December 31, 2022 were primarily due to changes in interest rates, and not due to increased credit risks associated with specific securities. Accordingly, as of December 31, 2022, the Company has not recorded an allowance for credit losses related to its available-for-sale debt securities.

6. Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consist of the following:

	December 31, 2022	December 31, 2021
Tax Credits	103,877	113,586
Prepaid and deferred expenses	552,882	498,252
Other receivable	87,430	81,862
Prepaid D&O Insurance	208,542	147,671
Total Prepaid expenses and other current assets	$ 848,854	$ 727,785

Tax credit consist of a value added tax credit ("VAT"). It is an indirect tax receivables from Switzerland and Spain tax authorities on purchases of goods and services executed in those countries.

Prepaid expenses refers to pre-payments made to the Company's vendors for future services. Deferred expenses mainly refer to research agreements entered into with third parties for research projects that will be recognized as expenses throughout the research period.

Other receivables refers to the Eurostars-2 grant, with co-funding from the European Union Horizon 2020 and Innosuisse – Swiss Innovation Agency, that contractually will be collected in March 2023.

Prepaid D&O insurance costs relate to an annual insurance premium which will be recognized in the statement of operations on a monthly basis throughout the one-year insurance period.

7. Property and Equipment, net

Property and equipment, net, consists of the following:

	December 31, 2022	December 31, 2021
Computer	$ 71,774	$ 55,141
Furniture and fixtures	57,603	42,148
Leasehold improvements	31,437	17,327
Laboratory instruments	36,894	19,759
Total property and equipment	$ 197,708	$ 134,375
Less: accumulated depreciation	(53,329)	(28,389)
Property and equipment, net	$ 144,379	$ 105,986

Property and equipment consist of computers, furniture and fixtures, lab instruments. No disposals, nor impairments occurred during the periods. Depreciation has been calculated by taking into consideration the use, purpose and financial-technical duration of the assets, based on their estimated economic lives. Depreciation expense for the years ended December 31, 2022 and 2021 was $26,632 and $15,484, respectively.

8. Operating lease; Right of use ("ROU") assets

The Company's leased assets include offices in Bethesda, Maryland, Lugano, Switzerland and Barcelona, Spain and a lab in Barcelona, Spain. Its current lease portfolio consists of leases with remaining terms ranging from three to five years. Renewal options are excluded from the calculation of lease liabilities since the Company is not reasonably certain that we will exercise the renewal option. The Company's lease agreements do not contain residual value guarantees or material restrictive covenants.

On December 24, 2020, the Company renewed a five-year operating lease term in Cluster II Building with Parc Scientific de Barcelona to lease lab and office space of 1,042 square feet. In connection with the lease, the Company paid a security deposit of EUR 6,469 classified as deposit in non-current assets. The Company is required to pay for operating costs, which are billed monthly based on the Company's share of the total rentable square footage. These additional charges are considered variable lease costs and are recognized in the period in which the costs are incurred. The Company accounted for the renewal as a modification of the original agreement and recorded an additional right-of-use asset and corresponding lease liability based on the incremental borrowing rate determined as of the effective date of the modified lease.

On June 1, 2021, the Company entered into a five-year operating lease agreement to lease office space in Via Soave, n.6 in Lugano, Switzerland. The lease agreement is renewable for additional five years. The Company is required to pay for operating costs, which are considered variable lease costs and are recognized in the period in which the costs are incurred. In connection with the lease, as guarantee for any damages claimed by the lessor, the Company deposited CHF 28,500 into a restricted bank account, which is classified in the financial statements as restricted cash.

On October 1, 2021, the Company entered into a three-year operating lease agreement to lease office space in Bethesda, Maryland. In connection with the lease, the Company paid a security deposit of USD 5,227, classified as

deposit in non-current assets, for the performance of all obligations, covenants and conditions and agreements under the lease.

On November 1, 2021, the Company entered into a five-year operating lease agreement in Torre D Building with Parc Scientific de Barcelona for larger office space of 1,417 square feet to accommodate the Company's continued growth and contemporaneously terminated a lease, entered in October 2020, in Torre I Building for 830 square feet. In connection with the Torre D Building lease, the Company paid a security deposit of EUR 4,325 classified as deposit in non-current assets. The Company is required to pay for operating costs, which are billed monthly based on the Company's share of the total rentable square footage. These additional charges are considered variable lease costs and are recognized in the period in which the costs are incurred.

On July 10, 2022, the Company entered into a new three-year operating lease agreement in Cluster II Building with Parc Scientific de Barcelona for a warehouse space of 245 square feet. In connection with the lease, the Company paid a security deposit of EUR 685 classified as deposit in non-current assets. The Company is required to pay for operating costs, which are billed monthly based on the Company's share of the total rentable square footage. These additional charges are considered variable lease costs and are recognized in the period in which the costs are incurred.

Operating leases are reflected on our balance sheet as operating lease ROU assets and the related current and non-current operating lease liabilities. ROU assets represent the right to use an underlying asset for the lease term, and lease liabilities represent the obligation to make lease payments arising from the lease agreement. Operating lease ROU assets and liabilities are recognized at the commencement date, or the date on which the lessor makes the underlying asset available for use, based upon the present value of the lease payments over the respective lease term. Lease expense is recognized on a straight-line basis over the lease term. Variable lease costs such as common area maintenance, property taxes and insurance are expensed as incurred.

The breakdown of the significant components of ROU assets, lease liabilities and operating lease expense is reported in the table below, together with the discount rate used in order to calculate the net present value of the lease liabilities as of those periods.

	December 31, 2022	December 31, 2021
Operating lease- right of use assets	$ 659,933	$ 901,042
Operating lease liability - current	$ 229,080	$ 219,137
Operating lease liability - non current	$ 441,784	$ 695,053
Weighted average remaining lease term - years	3.05	4.00
Weighted average discount rate	1.53	1.86

The amounts related to lease costs included in the consolidated statements of operations were as follows:

	December 31, 2022	December 31, 2021
Operating lease costs	$ 228,739	$ 191,329

The future minimum lease payments for the Company's operating leases as of December 31, 2022, are as follows:

Fiscal Year	Operating Leases
2023	$ 242,837
2024	224,325
2025	164,775
2026	54,251
Total future minimum lease payments	686,188
Less amount representing interest or imputed interest	15,324
Present value of lease liabilities	$ 670,864

9. Accounts Payable

Accounts payable are reported at their nominal value. Accounts payable refer to amounts due to third parties on outstanding invoices received for services already provided. As of December 31, 2022 and December 31, 2021, accounts payable amounted to $1,626,100 and $560,479, respectively. All accounts payable are due in less than 12 months.

10. Other current liabilities and deferred income

Other current liabilities and deferred income consist of the following as of December 31, 2022 and 2021:

	December 31, 2022	December 31, 2021
Payable for social security	$ 256,798	$ 255,068
Accrued payroll	660,556	465,382
Accrued expenses	1,082,091	681,770
Tax provision	107,311	380
Total Other Current Liabilities	$ 2,106,756	$ 1,402,600
Deferred income	55,180	266,504
Total Other Current Liabilities and Deferred Income	$ 2,161,936	$ 1,669,104

Payables for social security refer to amounts due to social security and employees withholding tax.

Accrued payroll refers to accruals for year-end bonuses, accrued vacations and extra-hours including social security charges, to be paid to employees.

Accrued expenses refer to invoices to be received from vendors for services performed and not yet billed.

Tax provision refers to a tax payable due to the Spanish Tax Authorities related to taxable income generated in Spain. Increase versus prior year is attributable to the allocation of stock based compensation expenses on stock options granted to our Spanish employees whose costs, for tax purposes, will be deductible at the time of the exercise.

Deferred income refers to income from the Company’s collaboration agreement with Zentalis Pharmaceuticals, Inc. It will be recognized in the statement of operations in accordance with the costs sustained.

11. Pension obligations

Net pension obligations related to the Company's defined pension plan refer only to Swiss employees and as of December 31, 2022 and 2021 can be summarized as follows:

	December 31, 2022	December 31, 2021
End of year funded status:		
Fair value of plan assets	$ 675,127	$ 943,025
(Projected benefit obligation)	(832,707)	(1,272,483)
Funded status	$ (157,580)	$ (329,458)
Accumulated benefit obligation	785,478	1,233,053
Reconciliation of funded status:		
Funded status beginning of year	$ (329,458)	$ (171,558)
Expense	(179,924)	(144,146)
Employer contribution	123,193	88,819
Translation differences	1,478	(1,437)
Change in AOCI over the year	227,131	(101,136)
Funded status at end of year	$ (157,580)	$ (329,458)
Component of net periodic pension costs:		
Service cost	$ 169,709	$ 132,809
Interest cost	3,376	1,318
Expected return on plan assets	(9,000)	(5,558)
Amortization of (gain)/losses	16,753	16,212
Amortization of prior service cost	(914)	(635)
Total	$ 179,924	$ 144,146
Service cost is reported in general and administrative expenses. All other components of net period costs are reported in interest income, net in the consolidated statement of operations		
Reconciliation of projected benefit obligation:		
Projected benefit obligation at January 1	$ 1,272,483	$ 648,846
Services cost	169,709	132,809
Employee contribution	83,731	49,143
Interest Cost	3,376	1,318
Benefit payments	(413,780)	315,300
(Gain) / loss on financial assumptions	(242,607)	(27,799)
(Gain) / loss on demographic assumptions	—	(43,123)
(Gain) / loss on experience	(715)	192,547
Translation differences	(25,130)	11,502
Plan Amendment	(14,360)	(8,060)
	$ 832,707	$ 1,272,483

	December 31, 2022	December 31, 2021
Reconciliation of fair value of plan assets:		
Fair value at January 1	$ 943,025	$ 477,288
Expected return on plan assets	9,000	5,558
Gain/(loss) on plan assets	(46,390)	(3,148)
Employer contributions	123,193	88,819
Employee contributions	83,731	49,143
Benefit payments	(413,780)	315,300
Translation differences	(23,652)	10,065
Fair value at December 31	$ 675,127	$ 943,025

	December 31, 2022	December 31, 2021
Change in net (gain)/loss:		
(Gain)/loss at beginning of year	$ 263,226	$ 154,665
(Gain)/loss on PBO during the year	(243,322)	121,625
(Gain)/loss on assets during the year	46,390	3,148
Amortization of gain/(loss)	(16,753)	(16,212)
(Gain)/loss at end of year	$ 49,541	$ 263,226

	December 31, 2022	December 31, 2021
Change in accumulated other comprehensive income (AOCI):		
AOCI at beginning of year	$ 255,801	$ 154,665
Net gain/(loss) amortized	(16,753)	(16,212)
(Gain)/loss on PBO during the year	(243,322)	121,625
(Gain)/loss on assets during the year	46,390	3,148
Prior Service Cost/(credit) occurring over the year	(14,360)	(8,060)
Net prior service (cost)/credit amortized	914	635
Total AOCI at end of year	$ 28,670	$ 255,801

The assumptions used in the determination of the benefit obligation and the plan assets for the pension plans and the pension obligation were as follows:

	December 31, 2022	December 31, 2021
Financial Assumptions (%pa):		
Discount rate	2.30%	0.30%
Interest credit rate / ERoA	1.50%	1.00%
Salary increases	2.50%	1.00%
Pension increases	0.00%	0.00%
Inflation	1.50%	1.00%
Demographic Assumptions:		
Lump-sum option	25%	25%
Retirement age	65/64	65/64
Proportion married	BVG 2020	BVG 2020
Allowance for child pensions	5% loading on risk benefits	5% loading on risk benefits
Mortality base table	BVG 2020	BVG 2020
Longevity improvement	CMI 2018 (1.25%)	CMI 2018 (1.25%)
Turnover	BVG 2020	BVG 2020
Disability	80% BVG 2020	80% BVG 2020

	December 31, 2022	December 31, 2021
Expected benefit payments:		
Year 1	$ 38,493	$ 162,208
Year 2	44,884	54,723
Year 3	50,459	58,224
Year 4	55,444	60,869
Year 5	59,369	63,281
Next 5 years	$ 450,981	$ 428,371
Other disclosure items:		
Next year's expected employer contribution	$ 128,746	$ 112,396

The actuarial gains in 2022 were primarily due to an increase in discount rates applied against future expected benefit payments and resulted in a decrease of the benefit obligation.

The Company's investment strategy for its pension plans is to optimize the long-term investment return on plan assets in relation to the liability structure to maintain an acceptable level of risk while minimizing the cost of providing pension benefits and maintaining adequate funding levels in accordance with applicable rules in each jurisdiction. The Company does not manage any assets internally. The plan asset relates to mandatory and discretionary contributions made in accordance with Swiss Law to a leading pension provider. The capital is insured and provides for a minimum rate of return. The fair value is based on the value of the assets held by the provider and as such has been classified within Level 3 of the fair value hierarchy.

We maintain a 401(k) saving Plan, which is available to all U.S. employees. Participants may make voluntary contributions. We make matching contributions according to the 401(k) Saving Plan's matching formula. All matching contributions and participant contribution vest immediately. The expense related to our 401(k) Savings Plan consist of our matching contributions. Expenses related to our 401(k) Savings Plan totaled $ 15,875 and $ 3,243 for the years ended December 31, 2022 and 2021.

Our UK employees are eligible to participate to our UK defined contribution pension scheme upon commencement of employment. The employees and the Company will make such contributions in line with the rules of the Pension Scheme in force. The expense related to our pension scheme consist of our matching contributions and totaled GBP 4,283 and nil for the years ended December 31, 2022 and 2021.

12. Loans

In March 2020, the Company obtained a CHF 14,600 five-year loan. The loan had zero interest and original maturity on June 30, 2025. The loan was guaranteed through joint and several sureties by the Swiss government. The loan is part of the infrastructure put in place by the Federal Council and Swiss Parliament in view of the economic consequences of the COVID-19 pandemic. In February 2022, the Company early extinguished the loan. No expenses or charges were incurred for the early extinguishment of the loan.

In August 2020, the Company obtained a CHF 638,000 (USD 700,221 at the historical foreign exchange rate) nine-year loan. The loan has zero interest and is due in quarterly installments of CHF 20,000, with payments commencing on December 31, 2021 and ending on September 30, 2029. The loan is part of the infrastructure put in place by the Federal Council and Swiss Parliament in view of the economic consequences of the COVID-19 pandemic, and the loan issued under the program does not bear interest and there are no applicable issuance costs. The Company accounts for its loan at face value, which is deemed to approximate the related fair value.

The future loan payments are reported in the table below:

		December, 31					
	Total	2023	2024	2025	2026	2027	Thereafter
Loan	$ (603,393)	(108,135)	(86,508)	(86,508)	(86,508)	(86,508)	(149,226)

13. Fair value measurement

Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires management to make judgments and consider factors specific to the asset or liability.

The carrying amounts of the Company's cash and cash equivalents, including money market funds, restricted cash and financial liabilities are considered to be representative of their respective fair values because of the short-term nature and the contractual terms of those instruments. The fair values of money market funds are based upon the quoted prices in active markets provided by the holding financial institution, which are considered Level 1 inputs in the fair value hierarchy according to ASC820. There have been no changes to the valuation methods utilized by the Company, nor were there transfers between levels of the fair value hierarchy.

	Fair value measurement at reporting date using		
	Quoted prices in active market for identical assets (level 1)	Significant other observable inputs (level 2)	Significant unobservable inputs (level 3)
December 31, 2022:			
Assets			
Marketable securities available for sale			
Debt securities - U.S. government treasury securities, current	12,826,954	—	—
Debt securities - U.S. government treasury securities, non current	1,941,488	—	—
Total marketable securities available for sale	$ 14,768,442	—	—
Cash and cash equivalents:			
Money market funds	4,401,165	—	—
Total cash and cash equivalents	$ 4,401,165	—	—
Total financial assets	$ 19,169,607	—	—
December 31, 2021:			
Assets			
Cash and cash equivalents:			
Money market funds	33,617,696	—	—
Total cash and cash equivalents	$ 33,617,696	—	—
Total financial assets	$ 33,617,696	—	—

The carrying amounts of prepaid expenses and other current assets, accounts payable and accrued expenses approximate their fair value due to their short-term maturities.

14. Common Stock, Preferred Stock and Warrants

As of December 31, 2022 and 2021, the authorized capital stock of the Company included 50,000,000 shares of common stock, $0.0001 par value and 10,000,000 shares of preferred stock, $0.0001 par value.

As of December 31, 2022 and 2021, 11,883,368 shares of common stock, $0.0001 par value, were issued and outstanding. No preferred stocks were outstanding as of December 31, 2022 and 2021.

In July 2020, in connection with the issuance of the Series B Preferred Stock through a private placement, the Company issued equity-classified warrants to designees of the placement agent to purchase an aggregate of

269,360 shares of our common stock at an exercise price of $4.46 per share, valued in the aggregate at USD 413,887 and included in the issuance costs of the Series B Preferred Stock. The warrants vested immediately upon issuance, provide for a cashless exercise right and are exercisable for a period of five years from July 20, 2020. On March 3, 2021, the Board approved a 1-for-0.880784 reverse stock split of the Company's outstanding equity instruments. The reverse stock split was approved by the Company's stockholders on March 4, 2021 and became effective on March 17, 2021. Shares of common stock underlying outstanding warrants were proportionately reduced from 269,360 to 237,249 and the respective exercise prices, were proportionately increased from $4.46 to $5.07 in accordance with the terms of the agreements governing such securities. As of December 31, 2021 and 2022, 11,862 and nil warrants, respectively, were exercised resulting in 3,283 shares having been issued following the cashless mechanism as per the respective warrant agreement.

On May 6, 2021, the Company entered into an investment banking services and financial advisory agreement and issued equity-classified warrants to designees of the investment bank to purchase an aggregate of 200,000 shares of the Company common stock at an exercise price of $13.75 per share, valued in the aggregate at USD 1,034 thousand. The warrants vested immediately upon issuance, do not provide for a cashless exercise right and are exercisable for a period of four years from May 6, 2021. The fair value of the warrants was fully recognized on a straight-line basis over the nine months service period as general and administrative expense. As of December 31, 2022, no warrants were exercised or exchanged.

15. Equity Incentive Plans

On September 24, 2020, the Board adopted the 2020 Omnibus Incentive Plan (the "2020 Omnibus Plan"). The 2020 Omnibus Plan provided for the granting of equity-based awards to our named executive officers, other employees, consultants and non-employee directors at a price to be determined by the Company's Board. The maximum number of shares to be issued under the 2020 Omnibus Plan was 1,153,827, as adjusted after a stock split of 1-for- 0.880784 approved by stockholders on March 4, 2021. The 2020 Omnibus Plan has been succeeded by the 2022 Equity Incentive Plan (as described below), and no additional awards will be granted under the 2020 Omnibus Plan although all outstanding awards granted under the 2020 Omnibus Plan will continue to be subject to the terms and conditions as set forth in the agreements evidencing such awards and the terms of the 2020 Omnibus Plan.

On December 23, 2021, the Board determined it advisable and in the best interests of the Company to adopt an Inducement Equity Incentive Plan (the "2021 Inducement Equity Incentive Plan") intended to induce new employees to join the Company for the benefit of individuals who satisfy the standards for inducement grants under Rule 5635(c)(4) of the Nasdaq Listing Rules and the related guidance issued thereunder with respect to the Company and its affiliates. The maximum number of shares reserved for issuance pursuant to awards granted under the 2021 Inducement Equity Incentive Plan is 1,000,000.

On June 16, 2022, at the Company's annual meeting of stockholders, the Company's stockholders approved the Company's 2022 Equity Incentive Plan (the "2022 Plan"). The 2022 Plan is the successor to and continuation of the 2020 Omnibus Plan, in order to allow the Company to continue to utilize a broad array of equity incentives in order to secure and retain the services of its employees, directors, and consultants, and that are intended to align the interests of employees, directors, and consultants with the interests of the Company's stockholders. The number of newly authorized shares that can be issued under the 2022 Equity Incentive Plan is 646,173, and the total number of shares reserved for issuance under the 2022 Plan (which amount includes shares remaining available for issuance under the 2020 Omnibus Plan as well as certain shares underlying awards then outstanding under the 2020 Omnibus Plan that will become available for issuance under the 2022 Plan if certain conditions are met) is 1,800,000.

In addition, beginning on January 1, 2023 and ending on (and including) January 1, 2032, the maximum number of shares of common stock that may be issued under the 2022 Plan will cumulatively be increased by 6% of the number of shares of common stock issued and outstanding on the immediately preceding December 31st, or such lesser number of shares as determined by the Board. No incentive stock options may be granted under the 2022 Plan after May 12, 2032 and the Board may suspend or terminate the 2022 Plan at any time. The Board is responsible for administering the 2022 Plan, including determining the individuals to be granted options and other awards, the number of shares of common stock subject to each award that an individual will receive, the exercise price per share (if any) subject to an award, and the exercise period of each option, subject to the terms of the 2022 Plan. No option will have a term in excess of 10 years. The exercise price of a stock option generally cannot be less than 100% of the fair market value of our common stock on the date of grant for non-statutory stock options.

Stock Option Grants

The following tables summarize the stock option activity for the year ended December 31, 2022 :

	Shares	Weighted Average Grant Date Fair Value	Weighted Average Exercise Price	Weighted Average Remaining Contractual Terms (Years)	Aggregate Intrinsic Value
Options outstanding as of December 31, 2021	960,216	$ 3.46	$ 5.13	9.23	163,237
Options granted	1,005,800	2.49	3.80	9.07	—
Options exercised	—	—	—	—	—
Options cancelled/forfeited	(86,354)	3.66	5.12	—	—
Options outstanding as of December 31, 2022	1,879,662	$ 2.94	$ 4.42	8.85	—

Options Outstanding					Options Exercisable	
Exercise Price	Number Outstanding	Weighted- Average Years Remaining on Contractual Life	Weighted Average Exercise Price	Weighted Average Grant Date Fair Value	Number Exercisable	Weighted Average Exercise Price
$3.29	2,500	9.75	$ 3.29	$ 2.45	—	—
$3.30	14,000	9.43	$ 3.30	$ 2.45	—	—
$3.38	496,662	7.81	$ 3.38	$ 2.30	391,066	$ 3.38
$3.47	10,000	9.02	$ 3.47	$ 2.56	—	—
$3.50	453,800	9.72	$ 3.50	$ 1.99	—	—
$4.01	242,700	9.02	$ 4.01	$ 2.97	—	—
$4.22	245,800	9.28	$ 4.22	$ 2.94	20,000	$ 4.22
$5.86	210,000	8.98	$ 5.86	$ 4.22	53,047	$ 5.86
$5.99	31,000	8.57	$ 5.99	$ 4.34	10,480	$ 5.99
$7.80	95,000	8.61	$ 7.80	$ 5.52	33,320	$ 7.80
$10.03	78,200	8.36	$ 10.03	$ 5.25	75,964	$ 10.03

On March 3, 2021, the Board approved a 1-for- 0.880784 reverse stock split of the Company's outstanding equity instruments. The reverse stock split was approved by the Company's stockholders on March 4, 2021, and became effective on March 17, 2021. Shares of common stock underlying outstanding stock options were proportionately reduced from 588,000 to 517,902 and the respective exercise prices were proportionately increased from $ 2.97 to $3.38 in accordance with the terms of the agreements governing such securities.

The reverse stock split did not impact the fair value of the stock option awards previously recorded because all the three following conditions were met: (i) the fair value of the modified award is the same as the fair value of the original award immediately before the original award is modified; (ii) the vesting conditions of the modified award are the same as the vesting conditions of the original award immediately before the original award is modified and (iii) the classification of the modified award as an equity instrument is the same as the classification of the original award immediately before modification.

The aggregate intrinsic value of stock options is calculated as the difference between the weighted average exercise price of the underlying stock options and the market price of the Company's common stock on December 31, 2022. Based on this calculation the intrinsic value of the outstanding stock options as of December 31, 2022 is nil.

The assumptions that the Company used to determine the grant-date fair value of stock options granted were as follows, presented on a weighted-average basis:

	Year Ended December 31,	
	2022	2021
Grant date fair value	$ 2.49	$ 4.27
Volatility	80 %	80 %
Expected term (years)	5.24	5.66
Risk-free interest rate	3.39 %	0.98 %
Expected dividend yield	—	—

Each of these inputs is subjective and generally requires significant judgment to determine. The weighted average grant-date fair value of the Company's stock options granted as of December 31, 2022 and 2021 was $2.49 and $4.27, respectively.

Restricted Stock Units and Performance Stock Units

The following table lists the RSUs awarded under the 2022 Plan for year ended December 31, 2022 and 2021:

	Year Ended December 31	
	2022	2021
RSUs granted and outstanding	103,050	—
Grant date fair value	$ 3.48	$ —

In 2022 the Company granted a total of 103,050 RSUs covering an equal number of shares of the Company's common stock to employees and consultants with a weighted-average grant date fair value of $ 3.48. The fair value of the RSUs is based on the closing price of the Company's stock on the grant date. The fair value of the RSUs is recognized as an expense over the duration of the vesting period. The weighted average duration of the vesting period for the RSUs granted is two years.

In December 2021, the Compensation Committee of the Board approved 200,000 awards of performance-based restricted stock units ("PRSUs") to an executive officer of the Company, subject to vesting on the achievement of certain services, business development and clinical development performance criteria. The grant date fair value for this PRSUs award was determined to be nil under ASC 718 based upon a determination that as of the grant date, it was not probable that the performance conditions will be achieved. The Company evaluates the performance targets in the context of its business development plan and product candidates' development pipeline and recognized compensation expense based on the probable number of PRSUs that will ultimately vest. The maximum potential fair value for the PRSU award, based on achieving the maximum level of performance under the award as of the grant date, was calculated to be $1,139 thousand, using the closing price of the Company's common stock on the grant date.

RSUs and PRSUs do not have the voting rights of shares of common stock, and the shares underlying the RSUs and PRSUs are not considered issued and outstanding. Under the 2022 Plan, each RSU/PRSU represents a contingent right to receive one share of the Company's common stock.

Total stock-based compensation expense is recognized for stock options and RSUs granted to employees and non-employees has been reported in the Company's consolidated statements of operations as follows:

	Year Ended December 31	
	2022	2021
Research and development	583,764	344,304
General and administrative	942,670	495,067
Total stock-based compensation	$ 1,526,434	$ 839,371

As of December 31, 2022, the total unrecognized compensation cost related to non-vested stock options and RSUs granted was USD 3,503 thousand and is expected to be recognized over 4 years.

16. Collaboration Agreement

On April 20, 2021, we entered into a multi-target collaboration agreement with Zentalis Pharmaceuticals, Inc. ("Zentalis") to discover new product candidates for the treatment of cancer. Under the terms of the agreement, the Company used its licensed SEE-Tx® computational platform technology to identify binding site on target proteins

and determine the potential suitability of these sites as drug targets, as well as their prospective therapeutic use in oncology. Pursuant the terms of the agreement, Zentalis agreed to pay the Company, on a program-by-program basis, a non-creditable, non-refundable, program initiation fee and reimbursement of expenses incurred by the Company in accordance with the agreed-upon research budget for each target in a multi-target agreement with a maximum of five mutually agreed to targets at the option of Zentalis.

The Company analyzed the Zentalis Collaboration Agreement and concluded that it represents a contract with a customer within the scope of ASC 606 and ASC 808. Based on that evaluation, (i) the program initiation fee was recognized as revenue in full as of June 30, 2021 at a point in time, at program inception as there is no unsatisfied performance obligation; (ii) the performance obligation to provide development services, is satisfied over a period of time as services are performed and Zentalis receives the benefit for the services. The Company will recognize revenue associated with the performance obligation as the research and development services are provided using an input method, according to the costs incurred.

During the course of 2022, Zentalis informed us of its desire to wind down the collaboration. As of December 31, 2022, the Company recognized $133 thousand of revenues and reported current portion of deferred revenues for $55 thousand.

17. Income taxes

The Company is subject to taxation in the U.S., Switzerland and in Spain. Taxes are recorded on an accrual basis and represent the allowances for taxes paid or to be paid for the year, calculated according to the current enacted rates and applicable laws. The Company has accumulated net tax losses since inception in Switzerland and in the U.S. The Company report a provision for income taxes due to the Spanish tax authorities pertaining to our branch Gain Therapeutics Sucursal en España.

For financial reporting purposes, loss before income taxes provision includes the following components:

	Year Ended December 31,	
	2022	2021
Domestic	$ (17,341,701)	$ (7,601,640)
Foreign	(156,061)	(6,284,958)
Total	$ (17,497,762)	$ (13,886,598)

Following is the breakdown of the components of income tax expense provision for the years ended December 31, 2022 and 2021:

	Year Ended December 31,	
	2022	2021
Current:		
Federal	—	—
State	—	—
Foreign	92,976	4,008
Total	$ 92,976	$ 4,008
Deferred:		
Federal	—	—
State	—	—
Foreign	—	—
Total	—	—
Total income tax expense	$ 92,976	$ 4,008

The breakdown of domestic and foreign NOLs and related DTAs are reported in the following table:

	Year Ended December 31,	
	2022	2021
NOLs (foreign)	$ (11,455,938)	$ (12,021,483)
NOLs (domestic)	(22,833,222)	(6,218,309)
Total NOLs	$ (34,289,160)	$ (18,239,792)
Deferred tax assets related to:		
Net operating loss (foreign)	2,140,174	2,243,668
Net operating loss (domestic)	6,283,703	1,677,610
Stock based compensation (foreign)	41,093	—
Stock based compensation (domestic)	399,538	253,439
Warrant expense	278,198	284,531
Patent expense	202,149	106,936
Other temporary differences	117,371	82,927
Total deferred tax assets	$ 9,462,226	$ 4,649,111
Deferred tax liabilities		
Depreciation and other	(20,011)	(16,118)
Total deferred tax liabilities	$ (20,011)	$ (16,118)
Valuation allowance	9,442,215	4,632,993
Net deferred tax assets	—	—

Foreign NOLs refer to the Company's Swiss subsidiary and according to Swiss tax law such NOLs can be carried forward for seven years and will begin to expire commencing from 2025 for the NOLs generated in 2017.

According to the U.S. Tax Cuts and Jobs Act ("TCJA") that was signed into law on December 22, 2017, federal net operating losses ("NOLs") incurred after December 31, 2017 can be carried forward indefinitely and are limited to 80% of taxable income in any tax period. The NOLs and tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service and state tax authorities. NOLs and tax credit carryforwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant stockholders over a three-year period in excess of 50 percent, as defined under Sections 382 and 383 of the Internal Revenue Code, as well as similar state provisions. This could limit the amount of tax attributes that can be utilized annually to offset future taxable income or tax liabilities. The amount of the annual limitation is determined based on the value of the Company immediately prior to the ownership change. Subsequent ownership changes may further affect the limitation in future years. The Company has not done an analysis to determine whether or not ownership changes have occurred since inception.

Deferred tax assets require an assessment of both positive and negative evidence when determining whether it is more likely than not that they can be recovered. Such assessment is made on a jurisdiction-by-jurisdiction basis. The Company's assessment includes an evaluation of cumulative losses, future sources of taxable income and risks and uncertainties related to our business. As of December 31, 2022 and 2021, the Company has determined that there is not sufficient evidence that the Company will be able to realize the benefits of the domestic and foreign deferred tax assets. Accordingly, due to uncertainty regarding their realization, the Company continues to maintain a full valuation allowance on the Company's domestic and foreign deferred tax assets as of December 31, 2022 and 2021 and until sufficient positive evidence will exist to support the reversal of the valuation allowance.

A reconciliation of income tax expense computed at the statutory federal income tax rate to the Company's effective tax rate as reflected in the consolidated financial statements is as follows:

	Year Ended December 31,	
	2022	2021
Federal income tax at US statutory rate	21.00%	21.00%
State income taxes, net of federal benefit	6.22%	6.52%
Permanent differences	(0.17)%	(0.10)%
Provision to return	(0.13)%	0.13%
Foreign tax	(0.12)%	(0.03)%
Valuation allowance	(27.33)%	(27.52)%
Effective income tax rate	(0.53)%	0.00%

As of December 31, 2022 and 2021, the Company had no accrued interest or penalties related to uncertain tax positions and no amounts have been recognized in the Company's statement of operations. There are no changes expected to occur in the next 12 months with respect to the status of the Company's uncertain tax positions.

The Company files income tax returns in Switzerland, Spain and in the United States. Tax years from 2018 and after remain subject to examination by the taxing jurisdictions. The NOL and tax carryforwards remain subject to review until utilized. The Company is currently not under examination by any tax authorities.

18. Net loss per common share

Basic net loss per common share is computed by dividing the net loss available to common stockholders by the weighted-average number of shares of common stock outstanding during the period. Diluted net loss per common share is computed by dividing the net loss attributable to common stockholders by the weighted-average number of shares of common stock and potentially dilutive securities outstanding during the period. For purposes of the diluted net loss per share calculation, preferred stock, warrants, stock options and RSUs are considered to be potentially dilutive securities, but are excluded from the calculation of diluted net loss per share because their effect would be anti-dilutive and therefore basic and diluted net loss per share are the same for all periods presented.

The following table sets forth the outstanding weighted-average potentially dilutive securities that have been excluded from the calculation of diluted net loss per share because to do so would have resulted in anti-dilutive impacts:

	Year Ended December 31	
	2022	2021
Options to purchase common stock	1,394,676	616,162
RSUs	35,764	—
Warrants to purchase common stock	425,387	364,926

In addition 200,000 PRSUs, granted in December 2021, contingently issuable upon meeting certain performance conditions are outstanding and will be included in the computation upon not resulting in anti-dilutive impacts and when the related performance conditions will be met.

19. Related Parties

Dr. Khalid Islam, the Chairman of the Company's Board, shareholder and founder of the Company, is currently the Chairman of the Board of Directors of Minoryx Therapeutics SL ("Minoryx"), and therefore Minoryx is considered a related party of the Company. In December 2017, the Company entered into an exclusive worldwide, royalty-bearing, assignable, transferable license agreement with Minoryx to use and exploit Minoryx's intellectual property and into an exclusive worldwide, royalty-bearing, assignable, transferable sublicense agreement with Universitat de Barcelona and Institucio Catalana Recerca Estudis Avancats in order to be able to develop its business, directly or indirectly, through sub-licensing to third parties or any other way of operation. According to the terms and

conditions of the Minoryx License Agreement, the Company shall pay to Minoryx as royalties:

- an amount equal to 8% of (i) net revenues with regard to products that would infringe (a) at least one composition of matter claim or (b) Minoryx molecules and (ii) sublicensing revenues; and

- an amount equal to 3% of net revenues with regard to products that would infringe at least (a) one method of claim or (b) Minoryx know-how (as such term is defined in the agreement).

As of December 31, 2022 and 2021, there were no receivables and payables, revenues or expenses with Minoryx.

20. Other Information

Own Shares

The Company does not hold, either directly or indirectly, its own shares and in these periods has not purchased or alienated its own shares.

Commitments

As of December 31, 2022 and 2021, the Company had research commitments with one year contractual maturity date for $1,461 thousand and $453 thousand, respectively.

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

We maintain "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, that are designed to ensure that information required to be disclosed in the reports that we file or submit under the Exchange Act is (i) recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms and (ii) accumulated and communicated to our management, including our principal executive officer and principal financial officer, to allow timely decisions regarding required disclosure. Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2022. Based upon the evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost benefit relationship of possible controls and procedures.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as such term as defined in Exchange Act Rule 13a-15(f) and 15d-15(f). Internal control over financial reporting is a process designed by, or under the supervision of, our principal executive officer and principal financial officer, or persons performing similar functions, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America.

As of December 31, 2022, our management assessed the effectiveness of our internal control over financial reporting using the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control-Integrated Framework (2013). Based on this assessment, our management concluded that, as of December 31, 2022, our internal control over financial reporting was effective.

Attestation Report of Independent Registered Public Accounting Firm

This Annual Report does not include an attestation report of our independent registered public accounting firm regarding internal controls over financial reporting. We are not required to engage our independent audit firm to perform an audit of the effectiveness of our internal controls over financial reporting for as long as we are an "emerging growth company" pursuant to the provisions of the JOBS Act.

Previously Reported Material Weakness

As previously disclosed, in connection with the audit of our financial statements as of and for the year ended December 31, 2021, we identified a material weakness in our internal control over financial reporting related to lack of adequate procedures and controls to ensure that accurate financial statements can be prepared and reviewed on a timely basis. The material weakness did not result in any material misstatements to the Company's previously issued financial statements, nor the financial statements in this Form 10-K.

The Company's management is committed to maintaining a strong internal control environment. In response to the identified material weakness, management, with the oversight of the Audit Committee of the Board of Directors, took comprehensive actions to improve our internal control over financial reporting and remediate the material weakness such as:

- Increased and hired additional personnel in the accounting function with the appropriate technical knowledge and expertise for financial reporting purposes;
- Implemented a more streamlined process for the preparation and review of financial information;

- Implemented strengthened, formalized and documented policies and internal control procedures which have been assessed as effective based on management's testing; and
- Successfully implemented an ERP system to automate certain processes, including a purchase requisition system, budgeting and reporting.

In connection with its review of disclosure and procedures as of December 31, 2022, management concluded that the previously identified material weakness has been remediated.

Changes in Internal Control Over Financial Reporting

Except for the changes in connection with the remediation of the previously identified material weakness discussed above, there have been no other changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act) that occurred during the fourth quarter of 2022 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

Information required by this item is incorporated by reference to the information set forth in the sections titled "Information about Our Board of Directors" and "Information about Our Executive Officers", "Corporate Governance, "Delinquent Section 16(a) Reports", and "Corporate Governance – Committees of the Board of Directors" in our definitive proxy statement to be filed with the SEC on Schedule 14A in connection with our 2023 Annual Meeting of Shareholders, or the Proxy Statement, which is expected to be filed no later than 120 days after December 31, 2022.

Code of Ethics

Our board of directors has adopted the Gain Therapeutics, Inc. Code of Business Conduct and Ethics, or Code of Ethics, that applies to all officers, directors and employees. This includes our principal executive officer, principal financial officer and principal accounting officer or controller or persons performing similar functions. The nominating and corporate governance committee is responsible for overseeing the Code of Ethics and must approve any waivers of the Code of Ethics for our employees, executive officers and directors. The Code of Business Conduct and Ethics is available on our website at www.gaintherapeutics.com. If we make any substantive amendments to the Code of Ethics or grant any waiver from a provision of the Code of Ethics to the principal executive officer, principal financial officer and principal accounting officer or controller or persons performing similar functions, we will promptly disclose the nature of the amendment or waiver on our website. Information contained on, or that can be accessed through, our website is not incorporated by reference into this Annual Report, and you should not consider information on our website to be part of this Annual Report.

ITEM 11. EXECUTIVE COMPENSATION

Information required by the items is incorporated by reference to the information set forth in the sections titled "Executive Compensation" and "Director Compensation" in the Proxy Statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Information required by this item is incorporated by reference to the information set forth in the sections titled "Securities Authorized for Issuance Under Equity Compensation Plans" and "Security Ownership of Certain Beneficial Owners and Management" in the Proxy Statement.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Information required by this item is incorporated by reference to the information set forth in the sections titled "Information Regarding the Board of Directors and Corporate Governance – Independence of the Board of Directors" and "Transactions with Related Persons" in the Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

Information required by this item is incorporated by reference to the information set forth in the section titled "Independent Registered Public Accounting Firm Fees and Services" in the Proxy Statement**.**

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) Financial Statements, Financial Statement Schedules and Exhibits.

(1) Financial Statements.

The financial statements required by Item 15(a) are filed as part of this Annual Report under Item 8, "Financial Statements and Supplementary Data."

(2) Financial Statement Schedules.

All financial statement schedules are omitted as the required information is not applicable or the information is presented in the consolidated financial statements or related notes.

(3) Exhibits.

Exhibit Number	Exhibit	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
3.1	Amended and Restated Certificate of Incorporation of Gain Therapeutics, Inc.	8-K	001-40237	3.1	3/17.2021
3.2	Amended and Restated Bylaws of Gain Therapeutics, Inc.	8-K	001-40237	3.2	3/17/2021
4.1	Description of Securities.	10-K	001-40237	4.1	3/25/2022
4.2	Investors' Rights Agreement, dated as of July 20, 2020, by and among Gain Therapeutics, Inc. and certain holders of its capital stock.	S-1	333-253303	4.2	2/19/2021
10.1+	Form of Indemnification Agreement for Officers and Directors.	S-1/A	333-253303	10.3	3/10/2021
10.2+	2020 Omnibus Incentive Plan.	S-1/A	333-253303	10.2	3/10/2021
10.3+	Gain Therapeutics, Inc. 2021 Inducement Equity Incentive Plan.	8-K	001-40237	10.1	12/28/2021
10.4+	Form of Stock Option Agreement under the 2021 Inducement Plan.	8-K	001-40237	10.2	12/28/2021
10.5	Minoryx Agreement between Minoryx Therapeutics, S.L. and GT Gain Therapeutics SA.	S-1	333-253303	10.3	2/19/2021
10.6+	Executive Employment Agreement, effective as of July 20, 2020, between Gain Therapeutics, Inc. and Eric I. Richman.	S-1	333-253303	10.4	2/19/2021
10.7+	Executive Employment Agreement, effective as of November 2, 2020, between Gain Therapeutics, Inc. and Salvatore Calabrese.	S-1	333-253303	10.8	2/19/2021
10.8+	Executive Employment Agreement, effective as of October 15, 2021, between Gain Therapeutics, Inc. and Matthias Alder.	10-K	001-40237	10.8	03/25/2022
10.9	Form of Exchange Agreement.	S-1	333-253303	10.10	2/19/2021
10.10	Form of Placement Agent Warrant.	S-1	333-253303	10.11	2/19/2021
10.11	Controlled Equity Offering℠ Sales Agreement, dated May 18, 2022, between Gain Therapeutics, Inc. and Cantor Fitzgerald & Co.	S-3	333-265061	1.2	5/18/2022
10.12 +	Gain Therapeutics Inc. 2021 Inducement Equity Incentive Plan Restricted Stock Unit Award Agreement.	S-8	333-266142	4.5	7/15/2022
10.13+	Gain Therapeutics Inc. 2022 Equity Incentive Plan.	S-8	333-266142	4.6	7/15/2022
10.14+	Gain Therapeutics Inc. RSU Award Grant Notice and Award Agreement (2022 Equity Incentive Plan).	S-8	333-266142	4.7	7/15/2022
10.15+	Gain Therapeutics Inc. Stock Option Grant Notice and Award Agreement (2022 Equity Incentive Plan).	S-8	333-266142	4.8	7/15/2022
10.16+	Transition Agreement, between Gain Therapeutics, Inc. and Eric Richman, dated September 19, 2022.	8-K	001-40237	10.1	9/19/2022
10.17+	Consulting Agreement, between Gain Therapeutics, Inc. and Eric Richman, dated September 20, 2022 (included as Exhibit A to the Transition Agreement).	8-K	001-40237	10.2	9/19/2022
10.18+	Amended and Restated Employment Agreement, between Gain Therapeutics, Inc. and Matthias Alder, dated September 20, 2022.	8-K	001-40237	10.3	9/19/2022
21.1+	Subsidiaries of Registrant.	S-1	333-253303	4.2	2/19/2021
23.1*	Consent of Independent Registered Public Accounting Firm.				
24.1*	Power of Attorney (included in the signature pages attached to this Annual Report on Form 10-K).				
31.1*	Section 302 Certification of Chief Executive Officer.				
31.2*	Section 302 Certification of Chief Financial Officer.				
32.1**	Section 906 Certification of Chief Executive Officer and Chief Financial Officer.				
101.INS*	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.				
101.SCH*	Inline XBRL Taxonomy Extension Schema Document.				
101.CAL*	Inline XBRL Taxonomy Extension Calculation Linkbase Document.				
101.DEF*	Inline XBRL Taxonomy Extension Definition Linkbase Document.				
101.LAB*	Inline XBRL Taxonomy Extension Label Linkbase Document.				
101.PRE*	Inline XBRL Taxonomy Extension Presentation Linkbase Document.				
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101).	Filed herewith.			

+ Management contract or compensatory plan or arrangement.
* Filed herewith

** This certification is deemed not filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended.

ITEM 16. FORM 10-K SUMMARY

None.

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.

GAIN THERAPEUTICS, INC.
(Registrant)

Date: March 23, 2023
By: /s/ Matthias Alder
Matthias Alder
Chief Executive Officer
(*Principal Executive Officer*)

Date: March 23, 2023
By: /s/ Salvatore Calabrese
Salvatore Calabrese
Chief Financial Officer
(*Principal Financial Officer*)

Date: March 23, 2023
By: /s/ Gianluca Fuggetta
Gianluca Fuggetta
Senior Director, Corporate Reporting
(*Principal Accounting Officer*)

POWER OF ATTORNEY

We, the undersigned directors and officers of Gain Therapeutics, Inc., hereby severally constitute and appoint Matthias Alder and Salvatore Calabrese, and each of them singly, our true and lawful attorneys, with full power to them, and to each of them singly, to sign for us and in our names in the capacities indicated below, all amendments to this Annual Report, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as each of us might or could do in person, and hereby ratifying and confirming all that said attorneys, and each of them, or their substitute or substitutes, shall do or cause to be done by virtue of this Power of Attorney.

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 in the capacities and on the dates indicated.

Dated: March 23, 2023	/s/ Matthias Alder Matthias Alder Chief Executive Officer and Director (Principal Executive Officer)
Dated: March 23, 2023	/s/ Salvatore Calabrese Salvatore Calabrese Chief Financial Officer (Principal Financial Officer)
Dated: March 23, 2023	/s/ Gianluca Fuggetta Gianluca Fuggetta Senior Director, Corporate Reporting (Principal Accounting Officer)
Dated: March 23, 2023	/s/ Khalid Islam Khalid Islam Chairman of the Board of Directors
Dated: March 23, 2023	/s/ Dov Goldstein Dov Goldstein Director
Dated: March 23, 2023	/s/ Han Peter Hasler Hans Peter Hasler Director
Dated: March 23, 2023	/s/ Gwen Melincoff Gwen Melincoff Director
Dated: March 23, 2023	/s/ Claude Nicaise Claude Nicaise Director
Dated: March 23, 2023	/s/ Eric I. Richman Eric I. Richman Director
Dated: March 23, 2023	/s/ Jeffrey Riley Jeffrey Riley Director

EXHIBIT 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

1. Registration Statement (Form S-8 No. 333-255061) pertaining to the Gain Therapeutics, Inc. 2020 Omnibus Incentive Plan,
2. Registration Statement (Form S-8 No. 333-266142) pertaining to the Gain Therapeutics, Inc. 2021 Inducement Equity Incentive Plan and the Gain Therapeutics, Inc. 2022 Equity Incentive Plan, and
3. Registration Statement (Form S-3 No. 333-265061) of Gain Therapeutics, Inc.;

of our report dated March 23, 2023, with respect to the consolidated financial statements of Gain Therapeutics, Inc., included in this Annual Report (Form 10-K) for the year ended December 31, 2022.

/s/ Ernst & Young AG

Lugano, Switzerland

March 23, 2023

Exhibit 31.1

Management Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

I, Matthias Alder, certify that:

1. I have reviewed this Annual Report on Form 10-K for the fiscal year ended December 31, 2022 of Gain Therapeutics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

March 23, 2023
Date

/s/ Matthias Alder
Matthias Alder
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

Management Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

I, Salvatore Calabrese, certify that:

1. I have reviewed this Annual Report on Form 10-K for the fiscal year ended December 31, 2022 of Gain Therapeutics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

March 23, 2023
Date

/s/ Salvatore Calabrese
Salvatore Calabrese
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

Certification of CEO and CFO Pursuant to
18 U.S.C. Section 1350,
as Adopted Pursuant to
Section 906 of the Sarbanes-Oxley Act of 2002

In connection with the Annual Report on Form 10-K of Gain Therapeutics, Inc. (the "Company") for the year ended December 31, 2022 to which this certification is attached as Exhibit 32.1 (the "Report"), Matthias Alder, as Chief Executive Officer of the Company, and Salvatore Calabrese, as Chief Financial Officer of the Company, each hereby certifies, pursuant to the requirement set forth in Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, (the "Exchange Act") and Section 1350 of Chapter 63 of Title 18 of the United States Code (18 U.S.C. §1350), that, to the best of his knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Exchange Act; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 23, 2023

/s/ Matthias Alder
Matthias Alder
Chief Executive Officer
(Principal Executive Officer)

/s/ Salvatore Calabrese
Salvatore Calabrese
Chief Financial Officer
(Principal Financial Officer)

This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Gain Therapeutics, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-K), irrespective of any general incorporation language contained in such filing.