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, 2024

OR

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

Commission File Number: 001-41802

NEUMORA THERAPEUTICS, INC.

(Exact Name of Registrant as Specified in its Charter)

Delaware	**84-4367680**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
490 Arsenal Way, Suite 200	
Watertown, Massachusetts	**02472**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (857) 760-0900

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock, par value $0.0001 per share	NMRA	Nasdaq Global Select Market

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

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

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

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

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

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

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

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

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

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 Exchange Act). Yes ☐ No ☒

The aggregate market value of common stock held by non-affiliates of the registrant was approximately $823.8 million based upon the closing price of the registrant's common stock on June 30, 2024 (the last business day of the registrant's most recently completed second fiscal quarter) on the Nasdaq Global Select Market. The calculation of the aggregate market value of common stock held by non-affiliates of the registrant excludes shares of common stock held by each officer, director and stockholder that the registrant concluded were affiliates on that date. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of shares of Registrant's Common Stock outstanding as of February 24, 2025 was 161,978,923.

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates certain information by reference from the registrant's proxy statement for the 2025 Annual Meeting of Shareholders. Such proxy statement will be filed no later than 120 days after the close of the registrant's fiscal year ended December 31, 2024.

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Special Note Regarding Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements concerning our business, operations and financial performance and condition, as well as our plans, objectives and expectations for our business, operations and financial performance and condition. Any statements contained herein that are not statements of historical facts may be deemed to be forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that are in some cases beyond our control and may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terminology such as "aim," "anticipate," "assume," "believe," "contemplate," "continue," "could," "due," "estimate," "expect," "goal," "intend," "may," "objective," "plan," "predict," "potential," "positioned," "seek," "should," "target," "will," "would," and other similar expressions that are predictions of or indicate future events and future trends, or the negative of these terms or other comparable terminology. These forward-looking statements include, but are not limited to, statements about:

- our expectations regarding the potential market size and size of the potential patient populations for our product candidates and any future product candidates, if approved for commercial use;
- our clinical and regulatory development plans including any related anticipated program milestones;
- the ability of our clinical trials to demonstrate safety and efficacy of our product candidates, and other positive results;
- our expectations with regard to the results of our clinical studies, preclinical studies and research and development programs, including the timing and availability of data from such studies;
- our estimates of the number of patients that we will enroll in our clinical trials and the timing of their enrollment;
- the timing of commencement of future preclinical studies and clinical trials and research and development programs;
- our ability to acquire, discover, develop and advance product candidates into, and successfully complete, clinical trials;
- our ability to reduce the time or increase the likelihood of success of our research and development relative to the traditional drug discovery paradigm using our precision neuroscience approach;
- our ability to improve, and the rate of improvement in, our precision neuroscience approach, or to realize benefits from such improvements;
- our expectations related to our precision neuroscience approach, including but not limited to whether it will have the same impact as data-driven precision medicine in the oncology field;
- our ability to achieve our mission to redefine neuroscience drug development by bringing forward the next generation of novel therapies that offer improved treatment outcomes and quality of life for patients suffering from brain diseases;
- our ability to scale our company;
- the timing of milestone payments;
- our intentions and our ability to establish collaborations and/or partnerships, and whether such collaborations and/or partnerships are successful;
- the timing or likelihood of regulatory filings and approvals for our product candidates;
- our commercialization, marketing and manufacturing, including any capabilities and expectations related thereto;
- our ability to keep pace with new technological developments;
- impact from future regulatory, judicial and legislative changes or developments in the United States and foreign countries;
- our intentions with respect to the commercialization of our product candidates, if approved;
- the pricing and reimbursement of our product candidates, if approved;
- the implementation of our business model and strategic plans for our business and product candidates, including additional indications which we may pursue;
- our ability to maintain our technical operations infrastructure to avoid errors, delays or cybersecurity breaches;
- our ability to effectively manage our growth, including our ability to retain and recruit personnel, and maintain our culture;

- the scope of protection we are able to establish and maintain for intellectual property rights covering our product candidates, including the projected terms of patent protection;
- estimates of our expenses, future revenue, capital requirements, our needs for additional financing and our ability to obtain additional capital;
- our expected use of our existing cash, cash equivalents and marketable securities;
- the period over which we estimate our existing cash, cash equivalents, and marketable securities will be sufficient to fund our future operating expenses and capital expenditure requirements;
- the performance of our third-party suppliers and manufacturers;
- the impact to our business from general political conditions, including but not limited to, disruptions in U.S. government operations and funding, geopolitical conflicts such as the war between Russia and Ukraine, the war between Israel and Hamas, and any sanctions or other repercussions that may result therefrom;
- the impact to our business from general economic conditions, including but not limited to, inflation, tariffs, recession risk, low consumer confidence and increasing interest rates;
- developments and projections relating to our competitors and our industry, including competing products; and
- other risks and uncertainties, including those listed under the caption "Risk Factors" in this Annual Report on Form 10-K.

These forward-looking statements are based on management's current expectations, estimates, forecasts and projections about our business and the industry in which we operate and management's beliefs and assumptions and are not guarantees of future performance or development and involve known and unknown risks, uncertainties and other factors that are in some cases beyond our control. As a result, any or all of our forward-looking statements in this Annual Report on Form 10-K may turn out to be inaccurate. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed under the section titled "Risk Factors" and elsewhere in this Annual Report on Form 10-K. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. We undertake no obligation to publicly update or revise any forward-looking statements contained herein for any reason after the date of this report to conform these statements to new information, actual results or changes in our expectations, except as required by applicable law.

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

Investors and others should note that we may announce material business and financial information to our investors using our investor relations website, Securities and Exchange Commission filings, webcasts, press releases and conference calls. We use these mediums, including our website, to communicate with the public about our company, our business and other issues. It is possible that the information that we make available may be deemed to be material information. We, encourage investors and others interested in our company to review the information that we make available on our website.

PART I

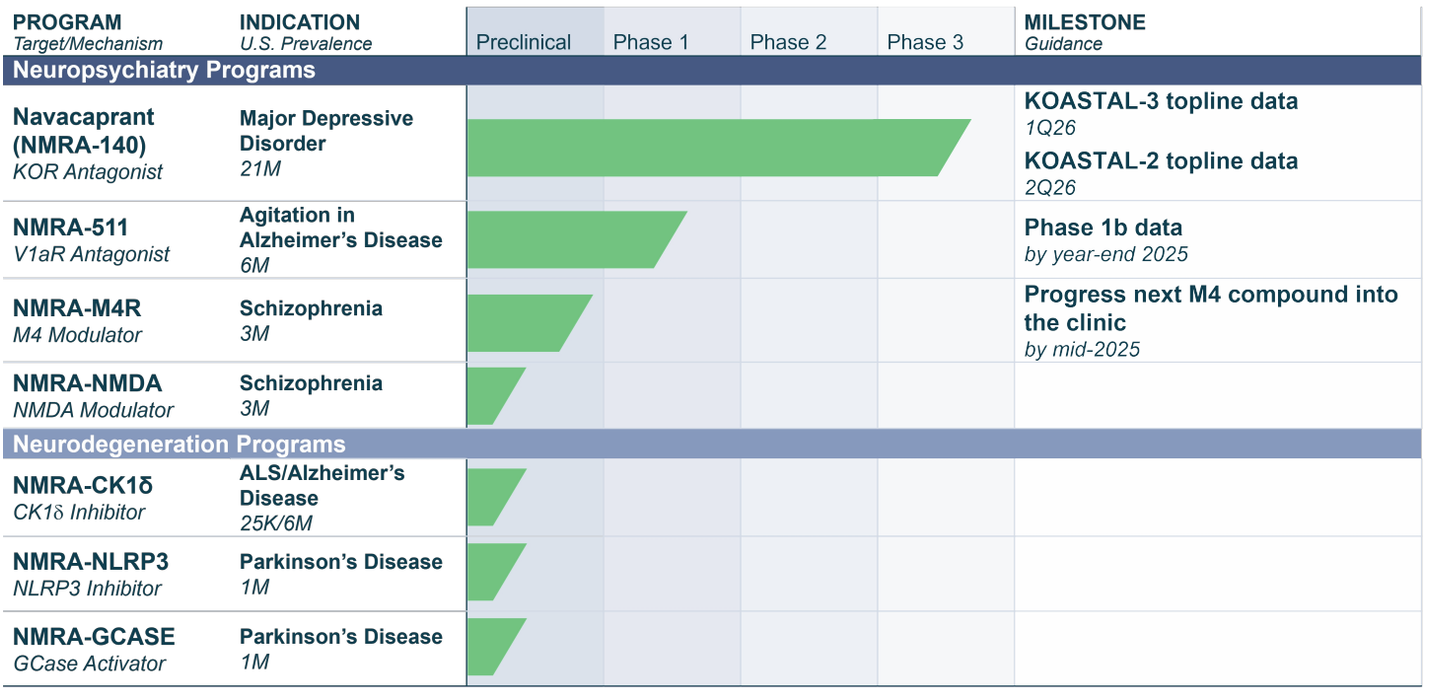
ITEM 1. Business.

Overview

We are a clinical-stage biopharmaceutical company founded to confront the global brain disease crisis by taking a fundamentally different approach to the way treatments for brain diseases are developed. We have rapidly scaled our therapeutic pipeline, which currently consists of seven neuroscience programs, including two clinical programs, that target novel mechanisms of action for a broad range of underserved neuropsychiatric disorders and neurodegenerative diseases. Our most advanced product candidate, navacaprant (NMRA-140), is a novel once-daily oral kappa opioid receptor (KOR) antagonist that is being developed for the treatment of major depressive disorder (MDD), which we believe has the potential to provide significant advantages relative to the standard of care, if approved. Navacaprant is being investigated in the KOASTAL program, a pivotal Phase 3 program, evaluating navacaprant monotherapy in patients with moderate to severe MDD. Neumora expects to report topline data from KOASTAL-3 in the first quarter of 2026 and KOASTAL-2 in the second quarter of 2026. Our next most advanced product candidate is NMRA-511, a highly selective, novel antagonist of the vasopressin 1a receptor (V1aR) being developed for the treatment of agitation associated with dementia due to Alzheimer's disease (AD). We are advancing a Phase 1b signal-seeking study investigating NMRA-511 initially in healthy elderly adult participants and then people with agitation associated with dementia due to AD, and we expect to report data from this study in by the end of 2025. Our M4 positive allosteric modular (PAM) franchise comprises multiple novel compounds that each have different chemical composition but optimal pharmacological properties, which have demonstrated robust activity in preclinical efficacy models and high selectivity for the M4 receptor subtype. We expect to progress our next M4 PAM into the clinic by mid-2025.

Our Product Candidates

We have rapidly scaled our pipeline through both internal discovery capabilities and business development activities. Our therapeutic pipeline comprises programs for neuropsychiatric disorders and neurodegenerative diseases, each targeting a novel mechanism of action. As shown in the table below, our current pipeline comprises seven programs, two of which are in clinical development and five of which are in preclinical development.



ALS = Amyotrophic lateral sclerosis; CK1δ= Casein Kinase I Isoform delta; GCase = Glucocerebrosidase; IP = Intellectual Property; KOR = kappa opioid receptor; M4R = Muscarinic Acetylcholine Receptor M4; NLRP3 = Nucleotide-binding Domain, Leucine-rich–containing Family, Pyrin Domain–containing-3; NMDA = N-methyl-D-aspartate; V1aR = Vasopressin 1a Receptor.

Figure 1: Neumora Pipeline

Navacaprant (NMRA-140) (KOR)

Navacaprant is a novel, oral once-daily, selective KOR antagonist in development for the monotherapy treatment of MDD. There are currently over 21 million adults in the United States diagnosed with MDD, 85% of whom either do not receive treatment with a pharmacological agent or fail to achieve remission with first-line selective serotonin reuptake inhibitors (SSRIs) / serotonin and norepinephrine reuptake inhibitors (SNRIs). We are developing navacaprant as a once-daily oral medication designed to modulate the dopamine and reward processing pathways that play an important role in the regulation of mood, cognition, reward and behavior. The KOR/dynorphin system is well-characterized, known to modulate depression, anhedonia and anxiety, and represents a novel approach to treating MDD and other major neuropsychiatric disorders. Navacaprant is being investigated in the KOASTAL pivotal Phase 3 program evaluating navacaprant monotherapy in patients with moderate to severe MDD.

The KOASTAL program includes three Phase 3 studies, KOASTAL-1, KOASTAL-2 and KOASTAL-3 as well as an open-label extension study, KOASTAL-LT, designed to evaluate the long-term safety of navacaprant, which were all initiated in 2023. In January 2025, we announced results from the first study in the KOASTAL program, KOASTAL-1. The study did not demonstrate a statistically significant improvement on the primary endpoint of change from baseline in the Montgomery-Åsberg Depression Rating Scale (MADRS) total score at Week 6 or the key secondary endpoint of a change from baseline in the Snaith-Hamilton Pleasure Scale (SHAPS) scale. In the study navacaprant was shown to be safe and generally well-tolerated with no serious adverse events reported. There was no signal for increased suicidal ideation or suicidal behavior compared to placebo, as measured by Columbia Suicide Severity Rating Scale (C-SSRS). Following the announcement of topline results from the KOASTAL-1 study, Neumora conducted extensive analyses to identify factors that might have contributed to the study outcome. These analyses suggested that selecting sites with demonstrated expertise in conducting MDD studies and enhancing medical monitoring may help ensure that patients who meet the trial criteria are enrolled in the KOASTAL program moving forward. Therefore, Neumora plans to make adjustments to the site selection, medical monitoring and screening tools included in KOASTAL-2 and KOASTAL-3. Neumora expects to report topline data from KOASTAL-3 in the first quarter of 2026 and KOASTAL-2 in the second quarter of 2026.

Indication Overview

Major depressive disorder the leading cause of disability, morbidity and mortality around the world with approximately 280 million people worldwide. MDD is characterized by symptoms such as prolonged sadness, anxiety, and suicidal thoughts. MDD is estimated to impact over 21 million adults in the United States with approximately 11 million receiving pharmacological treatment. Based on an assumed 5% market penetration for a new medicine, this would result in 550,000 patients treated. A three-fold increase in the prevalence of depressive symptoms has been estimated since the COVID-19 pandemic, exacerbating the significant burden of mental health across America.

Despite numerous approved treatments, there remains a significant unmet medical need in the treatment of MDD. Although MDD is hypothesized to involve multiple, diverse pathways as reflected in the variability of clinical presentation of major depressive episodes and response to treatment, most antidepressant medications act primarily through the monoamine pathway. Approved therapeutics include SSRIs, SNRIs and atypical antipsychotics. However, approximately 85% of MDD patients either do not receive treatment with a pharmacological agent or fail to achieve remission with first-line SSRI/SNRI. Further, patients treated for MDD often experience pronounced side effects, such as weight gain, sexual dysfunction, gastrointestinal issues and emotional blunting that contribute to treatment nonadherence. Side effects are a leading contributor to patients' unwillingness to take pharmacological treatment or treatment discontinuation.

In addition, current antidepressants do not adequately treat anhedonia, a core symptom of MDD. Defined in the DSM-5 as "markedly diminished interest or pleasure in all, or almost all, activities most of the day", anhedonia is a key feature of MDD and occurs in up to 70% of individuals with MDD. Anhedonia has been associated with greater severity of depressive symptoms, poor prognosis, as well as higher rates of suicidality. First-line MDD pharmacotherapies often fail to reduce anhedonia severity despite improvement or remission of other depressive symptoms and can induce or worsen anhedonia-like symptoms known as emotional blunting. Current antidepressants do not adequately address symptoms of anhedonia suggesting that their mechanisms of action do not effectively target the hedonic or reward processing pathways. Given the significant and increasing unmet medical need to effectively treat the core symptoms of MDD, a novel treatment for MDD that targets mood and hedonic pathways is warranted.

Target Rationale

Navacaprant is an investigational, small molecule antagonist of the KOR, which is a potentially novel approach to the treatment of MDD that has the potential to be the first new mechanism of action approved in decades. The KOR and endogenous agonist dynorphin, are expressed in brain regions that regulate the effects of stress on mood and cognition. The KOR/dynorphin system is an important mediator of stress-induced alterations in reward processing and a mood state known as dysphoria, which is a state of dissatisfaction, unease and unhappiness. Activation of KOR modulates neuronal circuits associated with many neuropsychiatric disorders, including depression, anhedonia, anxiety, schizophrenia, bipolar depression and obsessive-compulsive disorder.

Multiple lines of evidence establish the KOR system in mediating the effects of stress and reward in preclinical species and humans. In preclinical models of stress (such as forced swim and immobilization) or withdrawal from repeated exposure to drugs of abuse, stimulation of the dynorphin/KOR system can elicit anhedonia- and anxiety-like behaviors. In humans, KOR agonists have been reported to trigger symptoms of dysphoria, anxiety, and depression, while KOR antagonism has led to improvement of depressive symptoms. KOR antagonism blocks the biochemical and behavioral response to stress resulting in antidepressant- and anxiolytic-like behavioral effects.

Navacaprant is a potent and selective antagonist for KOR and, in preclinical studies, has shown more than 300-fold selectivity over the Mu opioid receptor (MOR). Selectivity for KOR over MOR may be an important factor to avoid the potential negative side effects associated with MOR activity. Comparatively, other clinical-stage KOR antagonists, including Aticaprant and CVL-354, have approximately 30-fold selectivity over MOR. We believe the selectivity profile of navacaprant has the potential to enable optimal receptor occupancy that supports a beneficial efficacy and tolerability profile. None of our preclinical studies are powered for significance given the purpose of such studies.

Clinical Data

The charts below depict data from the KOASTAL-1 study, as announced in January 2025.

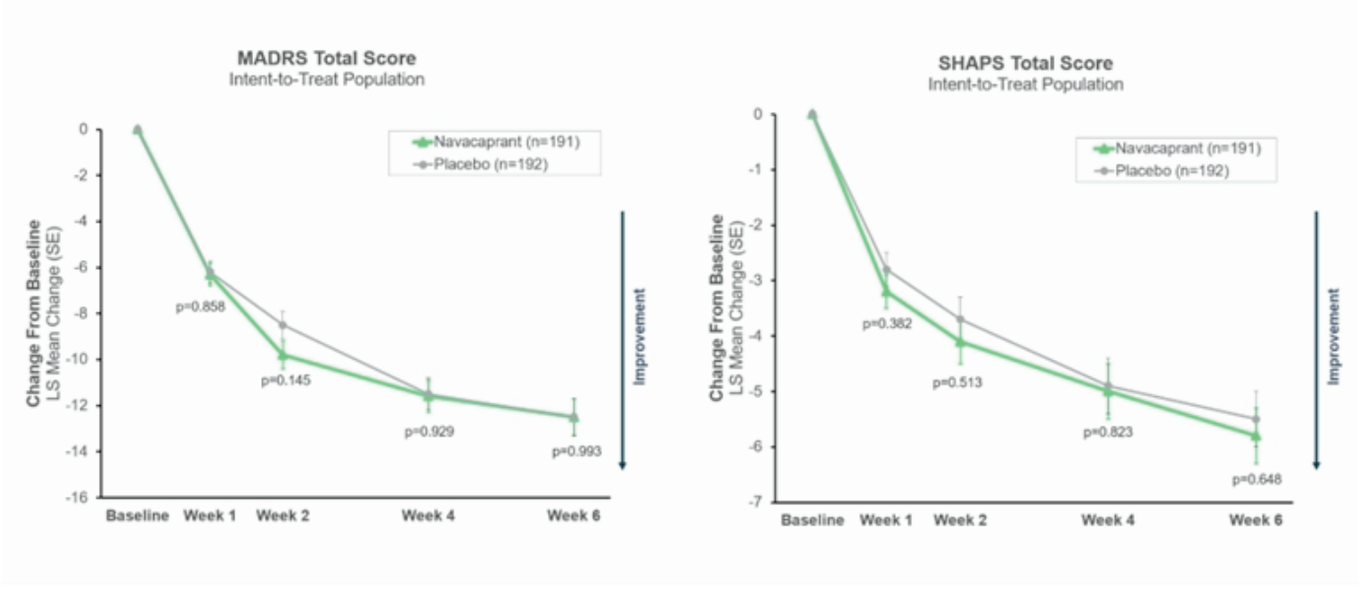


Figure 2: KOASTAL-1 topline results on MADRS (primary endpoint) and SHAPS (key secondary endpoint)

In a pre-specified subgroup analysis in KOASTAL-1 looking at treatment effects in female and male separately, we saw encouraging trends in the data that we are further investigating, including a contrast in drug and placebo responses in depressed mood and anhedonia in female participants compared to male participants. The study demonstrated a higher-than-expected placebo response that was especially pronounced among males. Males also demonstrated a lower drug response in the study. In contrast, females demonstrated encouraging trends in depressed mood and anhedonia.

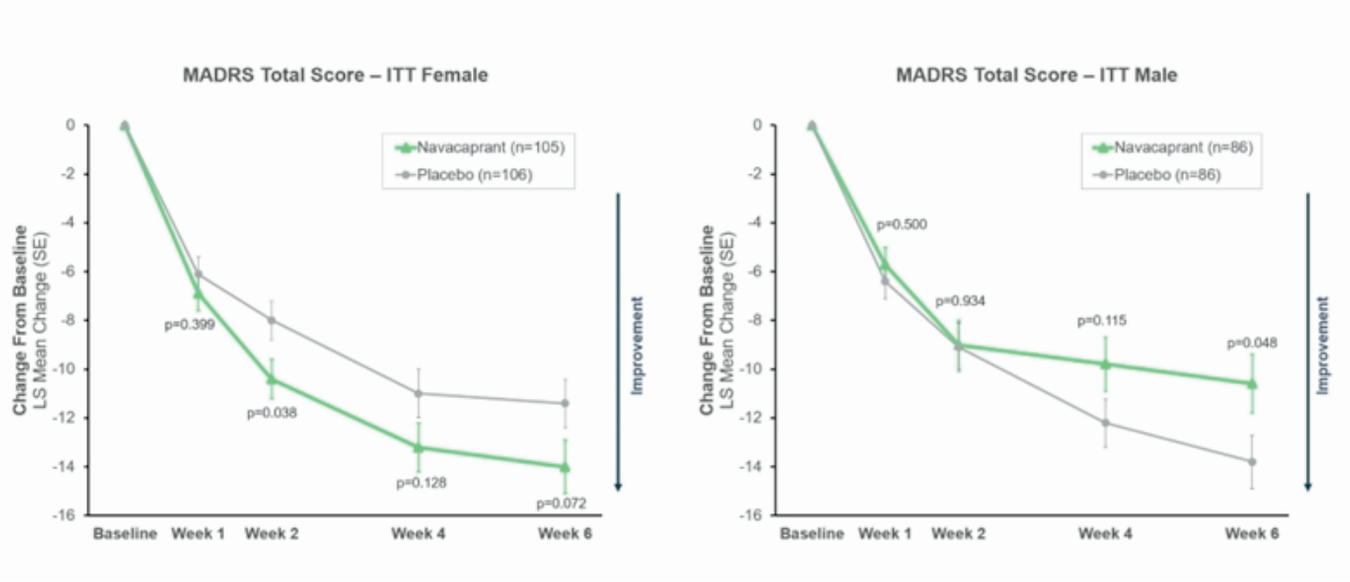


Figure 3: KOASTAL-1 topline results on MADRS by sex

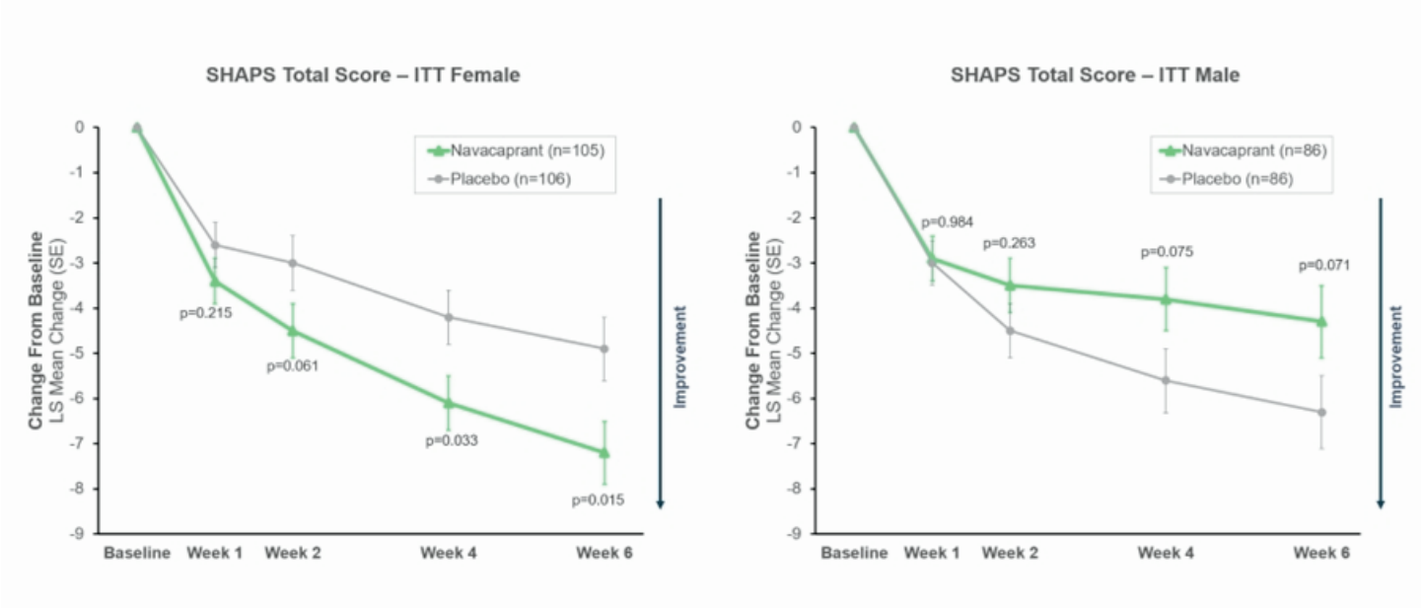


Figure 4: KOASTAL-1 topline results on SHAPS by sex

The chart below depicts safety and tolerability data. Additionally, there was a low discontinuation rate due to treatment emergent adverse events in the study (navacaprant 2.1%; placebo 3.1%), and 83.3% of navacaprant- treated patients who completed 6 weeks' treatment elected to enroll in KOASTAL-LT.

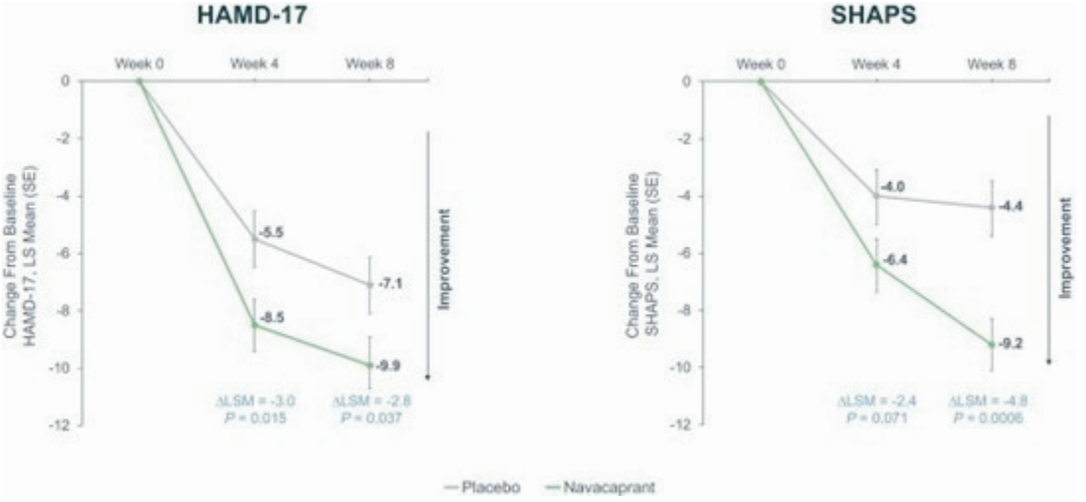
TEAEs Incidence (>2% in either treatment group)	Placebo n=192	Navacaprant n=191
Preferred Terms	n (%)	n (%)
Headache	14 (7.3%)	13 (6.8%)
Diarrhea	4 (2.1%)	10 (5.2%)
Nasopharyngitis	8 (4.2%)	7 (3.7%)
Pruritus	4 (2.1%)	7 (3.7%)
Nausea	6 (3.1%)	6 (3.1%)
Constipation	6 (3.1%)	5 (2.6%)
Insomnia	4 (2.1%)	3 (1.6%)
Fatigue	9 (4.7%)	2 (1.0%)
Upper respiratory tract infection	6 (3.1%)	2 (1.0%)
Dizziness	5 (2.6%)	2 (1.0%)
Dry mouth	4 (2.1%)	2 (1.0%)
Somnolence	4 (2.1%)	2 (1.0%)
Urinary tract infection	4 (2.1%)	2 (1.0%)
Back pain	5 (2.6%)	0

Figure 5: Navacaprant Was Well Tolerated with No Serious Adverse Events Observed in KOASTAL-1

In addition to KOASTAL-1, we previously completed a Phase 2 clinical trial evaluating navacaprant as a monotherapy treatment for patients with MDD. The Phase 2 clinical trial was initiated by BlackThorn Therapeutics prior to our acquisition of BlackThorn. The Phase 2 trial was a double-blind, placebo-controlled, randomized, multi-center trial of navacaprant monotherapy compared to placebo in MDD patients in the United States. Patients were randomized 1:1 to receive either an 80 mg dose of navacaprant or placebo once daily for eight weeks. The primary endpoint was a change from baseline in the HAMD-17 total score, a scale for measuring depressive symptom severity, of navacaprant compared to placebo at Week 8. Key secondary measures included change in anhedonia symptoms from baseline, as assessed by the Snaith–Hamilton Pleasure Scale (SHAPS) total score. Of the 204 patients randomized, 171 patients were included in the final efficacy population (patients with a baseline HAMD-17 total score that received at least one dose of study drug and had at least one post-baseline HAMD-17 assessment), and baseline demographics were balanced between the navacaprant and placebo arms.

The original trial design, when initiated by BlackThorn, specified enrolling solely mild to moderate MDD patients (baseline HAMD-17 total score ranging from 14-22). Following our acquisition of BlackThorn, we amended the trial inclusion criteria to include patients with moderate to severe MDD (baseline HAMD-17 total score $\geq$ 22), which is the patient population we intend to evaluate in our pivotal Phase 3 program and more typically studied in MDD clinical trials. We also added a prespecified analysis to the Phase 2 statistical analysis plan focused on the moderate to severe MDD population.

The final efficacy population for the pre-specified analysis of moderate to severe MDD (baseline HAMD-17 total score ≥ 22) included 100 adult subjects. In this moderate to severe MDD patient population, once daily dosing with 80 mg of navacaprant resulted in statistically significant (meaning that the results of the study are unlikely to have occurred by chance) treatment differences compared to placebo in depression, as measured by the HAMD-17 total score, and anhedonia, as measured by the SHAPS, each as demonstrated below.



Note: Graphs depict prespecified statistical sensitivity analyses for moderate to severe patients (n=100; baseline HAMD-17 ≥ 22)

Figure 6: Navacaprant: Established Proof-of-Concept for the Treatment of Depression and Anhedonia in Patients with Moderate to Severe MDD

In addition, navacaprant demonstrated statistically significant treatment differences compared to placebo on a range of other key secondary and exploratory measures of depression (HAMD-17 response and remission rates, HAMD-6, CGI-I and CGI-S), anxiety (HAM-A) and function (SDS) in the moderate to severe MDD population, each as demonstrated below.

	Week 4 Difference (p-value)	Week 8 Difference (p-value)
Depressive Symptom Improvement		
HAMD-17 Total Score Change from Baseline	-3.0 (0.015)	-2.8 (0.037)
HAMD-17 Response Rate % ≥50% Reduction in HAMD-17 from Baseline	21.4% (0.010)	25.9% (0.007)
Remission HAMD-17 Score ≤7	14.9% (0.014)	20.3% (0.005)
HAMD-6 Score (Core Symptoms) Change from Baseline in HAMD-6	-2.4 (<0.001)	-1.9 (0.013)
CGI-I % of Patients with Very Much / Much Improvement	12.4% (0.178)	19.0% (0.056)
CGI-S Change from Baseline	NA	-0.5 (0.041)
Anhedonia Symptom Improvement		
SHAPS Total Score Change from Baseline	-2.4 (0.071)	-4.8 (<0.001)
Anxiety Symptom Improvement		
HAM-A Total Score Change from Baseline	-2.4 (0.035)	-1.6 (0.197)
Functional Improvement		
SDS Total Score Change from Baseline	-2.5 (0.146)	-4.0 (0.013)

Note: Prespecified statistical sensitivity analysis for moderate to severe patients (HAMD-17 22)

Figure 7: Demonstrated Improvements Across a Range of Secondary and Exploratory Endpoints in Patients with Moderate to Severe MDD

Navacaprant also demonstrated positive results across the total population (n = 171), which included mildly depressed patients with baseline HAMD-17 scores as low as 14. Navacaprant demonstrated a statistically significant improvement in depression at Week 4 (HAMD-17 LSMD; -2.7, p = 0.003) and continued to demonstrate numerical improvements but did not achieve statistical significance compared to placebo at Week 8 (HAMD-17 LSMD; -1.7, p = 0.121), which was the primary endpoint of the original study designed by BlackThorn. Additionally, navacaprant demonstrated statistically significant improvements in anhedonia as assessed by the SHAPS at Week 4 (SHAPS LSMD; -2.8, p = 0.004) and Week 8 (SHAPS LSMD; -3.4, p = 0.002). These results were consistent with expectations for a population including mild-to-severe patients and supports the trial amendments we made to focus development on the moderate to severe MDD population.

Navacaprant was well tolerated with no severe adverse events. The overall discontinuation rates were higher on placebo compared to navacaprant (37% for placebo and 29% for navacaprant), and discontinuation rates related to treatment emergent adverse events (TEAEs) were higher on placebo compared to navacaprant (12% for placebo and 1% for navacaprant). The incidence rate of TEAEs was 35.3% for the navacaprant group and 44.1% for the placebo group. There were no TEAEs for navacaprant with greater than 5% incidence, which was consistent with placebo. The majority of the TEAEs were mild to moderate, with no severe TEAEs reported in the navacaprant group, and 4.9% severe TEAEs reported in the placebo group. Navacaprant was not associated with weight gain or sexual dysfunction. No evidence of suicidal behavior was identified as assessed by the Columbia Suicide Severity Rating Scale. We believe the tolerability profile of navacaprant observed to date will be viewed favorably by patients and physicians relative to other approved agents in use today.

TEAEs Incidence (>2% in either treatment group)

	Placebo n=102	Navacaprant n=102
Preferred Terms	**n (%)**	**n (%)**
Headache	5 (4.9)	5 (4.9)
COVID-19	3 (2.9)	4 (3.9)
Nausea	1 (1.0)	5 (4.9)
Diarrhea	3 (2.9)	2 (2.0)
Upper respiratory tract infection	1 (1.0)	3 (2.9)

Figure 8: Navacaprant Was Well Tolerated with No Serious Adverse Events Observed in the Phase 2 Clinical Trial

Neumora expects to report topline data from KOASTAL-3 in the first quarter of 2026 and KOASTAL-2 in the second quarter of 2026.

Additional Opportunities for Navacaprant

We believe navacaprant may offer benefit as a potential treatment for other neuropsychiatric populations beyond MDD, including bipolar depression (affecting approximately 7 million adults in the United States), post-traumatic stress disorder (affecting approximately 12 million adults in the United States), generalized anxiety disorder (affecting approximately 6.8 million adults in the United States), ADHD (affecting approximately 10 million adults in the United States) and substance use disorder (affecting approximately 20 million adults in the United States).

In March 2025 we announced that we discontinued the Phase 2 clinical trial investigating navacaprant for the treatment of bipolar depression to prioritize its resources to advance the KOASTAL Program and other pipeline programs. We continue to believe that navacaprant may offer benefit for treating bipolar depression and will evaluate opportunities to investigate it in this indication in the future.

Intellectual Property

We expect patent exclusivity for navacaprant to/until 2041, based on composition of matter protection and estimated patent term extension.

NMRA-511

NMRA-511 is an investigational antagonist of the vasopressin 1a receptor (V1aR). Vasopressin plays a role in the regulation of aggression, affiliation, stress and anxiety response. Based on our encouraging preclinical findings in non-human primates, as well as preclinical and clinical results from third parties, we believe V1aR has the potential to be a promising novel target for multiple neuropsychiatric disorders and neurodegenerative diseases across the spectrum of anxiety, aggression and stress. We are advancing a Phase 1b signal-seeking study in investigating NMRA-511 initially in healthy elderly adult participants and then people with agitation associated with dementia due to AD, and we expect to report topline data from this study by the end of 2025.

Target Rationale

NMRA-511 is an investigational small molecule antagonist of V1aR, which we believe represents a novel approach to the treatment of neuropsychiatric disorders. V1aR is a receptor for arginine vasopressin (AVP), a neuropeptide implicated in a range of physiological processes, including mood and stress.

Several lines of evidence indicate that V1aR antagonists have therapeutic potential for reducing symptoms of agitation. Pre-clinically, multiple models have demonstrated that activating the vasopressin system with the endogenous agonist AVP modulates social-emotional, anxiety and threat-related behaviors across species. In rodents, the selective breeding of strains for aggressive or anxiety traits show dysregulated vasopressin release and hypothalamic-pituitary-adrenal axis functioning. Additionally, vasopressin-deficient rodents displayed impaired responses to threat stimuli, reduced anxiety and depressive-like behaviors, and impaired aggression toward intruders. Clinically, in healthy volunteers, exogenously administered vasopressin increased autonomic responsiveness to threat stimuli and increased anxiety. Conversely, V1aR antagonist administration suppressed anxiety induced by unpredictable threats. This finding is in line with data showing that concentrations of vasopressin in cerebrospinal fluid were positively correlated with levels of aggression in individuals with personality disorders. Together, these data support the development of a V1aR antagonist for the treatment of symptoms of agitation, aggression, and anxiety.

Indication Overview

Alzheimer's disease is the most common cause of dementia, resulting in changes in memory, thinking and behavior. An estimated 6.7 million people in the United States currently live with Alzheimer's disease, and as the population ages, that number is expected to grow to more than 12 million by 2050. Behavioral symptoms including agitation and anxiety represent one of the most challenging aspects of managing Alzheimer's dementia. Researchers estimate that more than 70% of patients with Alzheimer's dementia experience agitation at some point in their disease, which results in significant disability, contributes to institutionalization, and diminishes quality of life for both patients and their caregivers. Despite the substantial unmet medical need associated with agitation in Alzheimer's disease, only one medicine (an atypical antipsychotic) has been approved as a treatment in the United States. However, this medication carries a black box warning for increased mortality in elderly patients. As a result of this black box warning, we believe that an unmet medical need for a safe treatment to address agitation in Alzheimer's disease remains.

Preclinical Data

NMRA-511 is a potent and selective antagonist for V1aR. In preclinical studies, NMRA-511 exhibited greater than 3,000-fold selectivity over the V1b and V2 receptors and approximately 300-fold selectivity over the oxytocin receptor. We conducted preclinical studies in marmosets using an animal model of anxiety/agitation known as the 'human threat test'. In these studies, NMRA-511 reduced measures of anxiety/agitation. We believe these preclinical data suggest that NMRA-511 has the potential to address anxiety and agitation disorders.

Based on preclinical data we have generated, we believe that the profile of NMRA-511 is favorable. For example, the potency (functional IC50) of NMRA-511 was demonstrated to be 0.9nM, with high selectivity over V1b, V2 and oxytocin receptors, as noted above. Additionally, the projected human receptor occupancy for NMRA-511 is greater than 90% for both the 10 mg and 20 mg doses.

We also conducted a Phase 1 SAD/MAD clinical trial with 55 healthy volunteers at doses up to 40 mg. NMRA-511 was well tolerated in the Phase 1 SAD/MAD clinical trial.

Development Plan

We are currently advancing a Phase 1b signal-seeking study with NMRA-511. The Phase 1b study will investigate NMRA-511 initially in healthy elderly adult participants and then people with agitation associated with dementia due to AD. Part A of the Phase 1b study is a randomized, double-blind, placebo-controlled cohort designed to evaluate the safety, tolerability and pharmacokinetics of NMRA-511 in approximately 8 healthy elderly participants. Part B of the Phase 1b study is a multicenter, randomized, double-blind, placebo-controlled, parallel-group cohort designed to evaluate the safety, tolerability, and efficacy of NMRA-511 20 mg twice-daily (BID) in approximately 88 people with agitation associated with dementia due to AD. The primary endpoint of this signal-seeking study is change from baseline to Week 8 on the Cohen-Mansfield Agitation Inventory total score. Neumora expects to report topline data from this Phase 1b study by the end of 2025.

M4 PAM Franchise

Our M4 franchise comprises multiple novel compounds that each have different chemical composition but optimal pharmacological properties, which have demonstrated robust activity in preclinical efficacy models and high selectivity for the M4 receptor subtype. Muscarinic receptor-targeting compounds have shown robust activity in clinical trials, demonstrating potential as an approach to treating schizophrenia, with the potential to treat other neuropsychiatric disorders such as dementia-related psychosis and cognitive disorders, where innovation has been stagnant for decades. We exclusively licensed certain intellectual property rights for our M4 PAM compounds from The Warren Center for Neuroscience Drug Discovery at Vanderbilt University. We expect to progress our next M4 PAM into the clinic by mid-2025.

Target Rationale

Our M4R compounds are investigational M4R PAMs. While current antipsychotics approved for schizophrenia, except Cobenfy, work primarily by antagonizing D2 dopamine receptors, evidence supports the approach of targeting the M4 muscarinic receptor to produce antipsychotic effects. M4 muscarinic receptor-targeting compounds have shown robust activity in clinical trials, demonstrating potential as an approach to treating schizophrenia in multiple, placebo-controlled clinical trials.

We believe selective M4R-positive allosteric modulators have the potential to deliver antipsychotic efficacy, while minimizing the side effects associated with current antipsychotics and other non-selective muscarinic agonists.

Indication Overview

Schizophrenia is a debilitating neuropsychiatric disorder characterized by positive symptoms (such as delusions and hallucinations), negative symptoms (such as diminished emotional expression) and cognitive symptoms (such as deficits in types of memory). The disease is also associated with a 10-to-25-year reduction in life expectancy overall. It is estimated that approximately three million people in the United States have schizophrenia.

Despite the recent approval of KarXT (brand name Cobenfy) for the treatment of schizophrenia in adults, we believe there is still opportunity for additional novel treatments for schizophrenia. KarXT requires twice daily dosing and is associated with unfavorable adverse events. For example, in the Phase 3 EMERGENT-2 and EMERGENT-3 trials, the most common adverse reactions (≥5% and at least twice placebo) were nausea, dyspepsia, constipation, vomiting, hypertension, abdominal pain, diarrhea, tachycardia, dizziness and gastroesophageal reflux disease. The majority of currently approved antipsychotics based on mechanisms originally based on chlorpromazine, which was developed in the 1950s. Beyond KarXT, currently approved therapies focus on treating the positive symptoms of schizophrenia and have little impact on the negative or cognitive symptoms. They also have potentially serious side effects, including movement and metabolic effects, which historically have resulted in poor compliance. Therefore, we believe there is an opportunity for novel medicines with simplified dosing regimens and differentiated tolerability profiles to address remaining unmet needs in the treatment of schizophrenia.

Development Plan

We expect to progress our next M4 PAM into the clinic by mid-2025.

NMRA-NMDA

NMRA-NMDA is an NMDA positive allosteric modulator program that we intend to develop for the treatment of schizophrenia. Recent breakthroughs in third-party psychiatric genetic studies have provided genetic evidence in support of the role of NMDA in schizophrenia. Furthermore, human studies suggest NMDA receptor antagonists, such as ketamine, lead to a schizophrenia-like syndrome, which provides compelling evidence for this target. Our NMRA-NMDA program is in the preclinical phase of development.

Target Rationale

NMRA-NMDA is an investigational allosteric modulator of NMDA-type glutamate receptors. Glutamate is the major excitatory neurotransmitter in the brain, and dysregulation of glutamate levels NMDA receptor function and downstream pathways has long been hypothesized to be key molecular drivers of schizophrenia. Recently large studies of schizophrenia patients which have looked to identify the genetic basis of schizophrenia have identified the GRIN2A gene, which produces the GluN2A subunit of the NMDA receptor, as a critical genetic risk factor for the disease. Human pharmacology experiments have indicated that decreases in NMDA receptor activity can lead to schizophrenia-like symptoms in healthy volunteers. These studies together suggest compounds which elevate NMDA receptor activity have the potential to treat the disease.

Indication Overview

We believe NMRA-NMDA could have potential in patients with SCZ.

Preclinical Data

We have identified a series of investigational NMDA positive allosteric modulators that are potent and orally bioavailable. Our NMRA-NMDA program was internally discovered and we have focused on proprietary chemistry that targets a distinct binding site on the target compared to other approaches. The lead molecules have been identified through experiments in cell-based assays to evaluate potency and selectivity and also characterize their mechanism of action. These molecules have also demonstrated target engagement and pharmacodynamic activity in animal models relevant for the mechanism and disease indication.

Development Plan

Our NMRA-NMDA program is in the preclinical stage of development.

NMRA-CK1δ

NMRA-CK1δ is a CK1d inhibitor program that we intend to develop for ALS. CK1δ is a kinase that has been identified as a proximal upstream regulator of TDP-43 phosphorylation, a key driver of TDP-43-driven pathology in approximately 95% of sporadic ALS cases. There is also genetic evidence supporting the role of TDP-43 in ALS. Our NMRA-CK1δ program is in preclinical development. We exclusively licensed certain intellectual property rights related to NMRA-CK1δ from Amgen.

Target Rationale

CK1δ is a key proximal kinase phosphorylating TDP-43, a protein implicated in the pathology of both sporadic and familial ALS and certain types of frontotemporal dementia (FTD). Protein aggregates containing phosphorylated TDP-43 are present in degenerating motor neurons of ALS patients. It is hypothesized that reduction of TDP-43 phosphorylation with a CK1δ inhibitor will reduce TDP-43 driven pathology and slow disease progression. Published data have demonstrated that CK1δ inhibitors reverse aberrant TDP-43 related phenotypes in both *in vitro* and *in vivo* studies.

Indication Overview

ALS is a rapidly progressing neurodegenerative disease that affects motor neurons in the brain and spinal cord. As motor neurons die, the brain loses the ability to initiate and control muscle movement, and patients may lose the ability to speak, eat, move and breathe. Approximately 5,000 people in the United States are diagnosed with ALS each year, and approximately 16,000 patients live with ALS in the United States at a given time. ALS usually affects patients between the ages of 40 and 70.

Existing therapeutics have modest effects on survival and physical functioning with no effect on mortality and patients have an average life expectancy of two to five years from diagnosis, emphasizing the high unmet medical need.

Preclinical Data

NMRA-CK1δ inhibitors have nanomolar potency, are selective over a number of other kinases and exhibit cell-based activity. Compounds have properties consistent with favorable CNS penetration and we are conducting experiments in both *in vitro* cell models and *in vivo* models relevant for ALS. In addition, we are conducting experiments to analyze ALS multi-modal patient data using our proprietary toolbox of data science algorithms to determine whether there are sub-groups of ALS patients which could be more responsive to NMRA-CK1δ.

We have onboarded data from the Answer ALS dataset to our Precision Toolbox, which we are analyzing as we advance our NMRA-CK1δ program. The preliminary work with this dataset shows that an unsupervised drug signature independent clustering approach reveals patient clusters that are overlapping in terms of the likelihood they would respond to a CK1δ compound. However, when applying supervised clustering methods that incorporate the NMRA-CK1δ drug signature, enhanced precision in identifying distinct clusters that may be more responsive to a CK1δ compound within the ALS population is demonstrated. We believe this work may enable the generation of hypotheses around "responder/non-responder" populations that we can consider to be included in future clinical studies.

Development Plan

Our NMRA-CK1δ program is in the preclinical stage of development.

NMRA-NRLP3

NMRA-NLRP3 is an inhibitor program focused on targeting the NLRP3 inflammasome for the treatment of certain neurodegenerative conditions. The inflammasome is a critical part of the innate immune system that responds to pathogens and cellular damage and is implicated in brain disorders, such as PD, as well as immune disorders. The NLRP3 inflammasome can be activated in brain microglia, a type of cell in the brain, and other cell types by a range of proteins linked to neurodegeneration, including alpha-synuclein (a neuronal protein that regulates synaptic vesicle trafficking), which suggests the inflammasome may have a mechanistic role in PD. Our NMRA-NLRP3 program is in the preclinical phase of development.

Target Rationale

The NLRP3 inflammasome is a central component of the innate immune system and is chronically activated in neurodegenerative and inflammatory diseases. It is essential for triggering innate immunity and protecting the host from a variety of pathogens and cellular stressors. Pathological proteins associated with PD, ALS, and AD have also been shown to activate the NLRP3 inflammasome, including (i) alpha-synuclein, which is a critical driver of PD an other so-called synucleinopathies, (ii) TDP-43, which as stated above is linked to ALS, FTD and other TDP-43 opathies, (iii) beta-amyloid and tau, proteins which are most closely linked to AD. A growing body of work in PD model systems has shown that inhibition of the NLRP3 inflammasome can impact various disease phenotypes in a therapeutically relevant manner.

Indication Overview

PD is a neurodegenerative disorder resulting in progressive and debilitating motor symptoms, such as hypokinesia, or decreased body movement, and bradykinesia, or rigidity, tremor, and postural instability. PD patients lose dopamine-producing neurons in the substantia nigra, the region of the brain responsible for motor control. Approximately one million people in the United States have PD. Current therapeutics for PD focus on increasing levels of dopamine to manage disease symptoms. For example, levodopa/l-dopa is converted into dopamine in the brain while mono-amine oxidase-B and catechol-O-methyl transferase inhibitors reduce the breakdown of dopamine. Each therapeutic class has meaningful limitations in efficacy and side-effects.

Preclinical Data

We have identified multiple series of NLRP3 inhibitors that showed potency and selectivity in a range of cellular assays in different immortalized cell lines and primary immune cells including microglia. These molecules have also demonstrated target engagement and pharmacodynamic activity in relevant animal models for the proposed mechanism.

Development Plan

Our NMRA-NLRP3 program is in the preclinical phase of development. In addition, we are conducting experiments to analyze PD multi-modal patient data using our proprietary toolbox of data science algorithms to determine whether there are sub-groups of PD patients which could be more responsive to NMRA-NLRP3.

NMRA-GCase

NMRA-GCase is an activator program focused on elevating the activity of the enzyme glucocerebrosidase (GCase) that we are developing for the treatment of PD. Mutations in the GBA1 gene, which codes for the enzyme GCase, are the single largest genetic risk factor for PD. GCase deficiencies lead to storage disorders of the lysosome, which plays an important role in maintaining cellular balance, and a group of patients with PD have lysosomal dysfunction. Our NMRA-GCase program is in the preclinical phase of development. We exclusively licensed certain intellectual property rights related to NMRA-GCase from Amgen.

Target Rationale

The enzyme GCase belongs to a family of proteins known as "lysosomal glycoside hydrolases" that are located within the lysosomal compartments of cells and cause the cleavage of complex molecules containing sugar. The GBA gene encodes GCase and homozygous or compound heterozygous mutation carriers in GBA are associated with Gaucher's disease, a lysosomal storage disorder. Mutations in the GBA gene are associated with PD (approximately 10% of PD patients). Functional GCase is crucial for the recycling and disposal of proteins and lipids in the lysosome. Numerous scientific studies have demonstrated that GCase mutations trigger lysosomal dysfunction, cell toxicity, inflammation and the accumulation of alpha-synuclein (a hallmark of PD), which is toxic to neurons.

Indication Overview

PD is a neurodegenerative disorder resulting in progressive and debilitating motor symptoms, such as hypokinesia, or decreased body movement, and bradykinesia, or rigidity, tremor, and postural instability. PD patients lose dopamine-producing neurons in the substantia nigra, the region of the brain responsible for motor control. Approximately one million people in the United States have PD.

Preclinical Data

We have identified multiple small molecule series through a high-throughput screen as GCase activators. Our series activates both wild type and mutant forms of the enzyme with similar potency, and we have biophysical data that they bind directly to the target, not acting in an indirect fashion.

Development Plan

Our NMRA-GCase program is in the preclinical phase of development.

Intellectual Property

Our success depends in large part upon our ability to obtain and maintain proprietary protection for our products and technologies and to operate without infringing the proprietary rights of others. Our policy is to protect our proprietary position by, among other methods, filing U.S. and foreign patent applications that relate to our proprietary technologies, inventions and improvements that are important to the development and implementation of our business. We also rely on trademarks, trade secrets, know-how and continuing technological innovation.

Our patent portfolio includes three primary types of patents and patent applications: (i) molecule patents that cover composition of matter and methods of treatment; (ii) patents directed to our precision neuroscience approach that covers key artificial intelligence (AI) algorithms and machine learning (ML)-based processes for identifying and monitoring targeted patient populations; and (iii) biomarker patents that cover methods of diagnosing and treating patients, with our molecules. As of December 31, 2024, we own, co-own, or have an exclusive license to over 340 patents and pending applications in the United States and foreign jurisdictions. These include 46 issued U.S. patents and 149 issued foreign patents.

The term of any individual issued patent depends upon the legal term of the patent in the country in which it is obtained. In most countries that we file, the patent term is 20 years from the earliest date of filing a nonprovisional patent application related to the issued patent. However, the actual protection afforded by an issued 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. A U.S. patent also may be accorded patent term adjustment, or PTA, under certain circumstances to compensate for delays in obtaining the patent from the USPTO. In some instances, such a PTA may result in a U.S. patent term extending beyond 20 years from the earliest date of filing a non-provisional patent application related to the U.S. patent. In addition, in the United States, the term of a U.S. patent that covers an FDA-approved drug may also be eligible for patent term extension, which permits patent term restoration as compensation for the patent term lost during the FDA regulatory review process.

Molecule Patent Portfolio

As of December 31, 2024, our molecule patents include over 285 owned and exclusively licensed patents and patent applications, of which 29 are issued U.S. patents and 137 are issued foreign patents. A further breakdown of our material molecule patents and applications as of December 31, 2024 is below:

- **Navacaprant (NMRA-140):** We own, co-own or exclusively license two patent families that include five issued U.S. patents, and additional U.S. and foreign patents and pending applications related to navacaprant. These patents and applications cover composition of matter. We have an exclusive license from The Scripps Research Institute (TSRI) to one of the patent families, which includes two issued U.S. patents that are expected to expire in 2033 excluding any patent term adjustment or patent term extension. We co-own the other patent family with TSRI. This family has three patents granted in the United States, and additional patents granted in Europe, China, Hong Kong, Korea, Australia, Mexico, Singapore, India, Israel, Japan, Eurasia and South Africa. Additional patent applications in this family are pending in Canada, and Brazil. The last issued patent from these families licensed to us from TSRI is expected to expire in 2038 excluding any patent term adjustment or patent term extension. We anticipate that we will apply for any available patent term extension to the family with base expiration in 2038.
- **NMRA-511:** We own two issued U.S. patents and additional U.S. and foreign patents and pending applications related to NMRA-511. These patents and applications cover composition of matter. This family has two patents granted in the United States, and additional patents granted in Singapore, Europe, Japan, Mexico, Australia, Israel, Hong Kong, India, New Zealand, South Africa, and China. Additional patent applications in this family are pending in Canada, and Korea. The issued U.S. patents and future patents that issue are expected to expire in 2038 excluding any patent term adjustment or patent term extension.
- **M4R:** We exclusively license several patent families that include 17 issued U.S. patents and additional U.S. and foreign patents and pending applications related to our M4R franchise from Vanderbilt. These patents and applications cover composition of matter. The last patent expiration date for the issued patents and patents expected to issue that are exclusively licensed from Vanderbilt that cover NMRA-266 is 2041 excluding any patent term adjustment or patent term extension. The last patent expiration date for patents expected to issue that are exclusively licensed from Vanderbilt that cover our other M4Rs is 2044 excluding any patent term adjustment or patent term extension.

Precision Toolbox Patent Portfolio

Our Precision Toolbox is covered by process patents and patent applications relating to multimodal methods of identifying and monitoring targeted patient populations. The process patents and patent applications are directed to (i) the use of tools to detect and capture data from patients using specific modalities, unimodal processing and/or diagnostic techniques for specific modality types; and (ii) multimodal machine learning and AI-based processes for combining different types of data to identify and monitor targeted patient populations. Our Precision Toolbox patent portfolio includes several patent families, comprising 17 issued U.S. patents, additional pending U.S. and foreign patent applications. The issued U.S. and foreign patent and future patents that issue from these families are expected to expire between 2038 and 2045, excluding any patent term adjustment.

The Precision Toolbox patent portfolio also includes coverage for multimodal processes that span various modalities including genetic, transcriptomic, proteomic, in vitro cell, MRI, EEG, voice, facial, behavioral, clinical and others.

Biomarker Patent Portfolio

Our Precision Toolbox is also covered by biomarker patents and applications directed to unimodal and multimodal biomarkers that identify patients that respond to specific drugs. These biomarker patents are process patents for identifying and diagnosing patients with selected biomarkers, and methods of treating patients with those biomarkers with neural drugs. We own more than six patent applications relating to biomarkers. Generally speaking, those selected biomarkers include genetic, proteomic, task-based, clinical assessment-based, and others.

Trade Secrets

In addition to our reliance on patent protection for our inventions, product candidates and precision neuroscience approach, we also rely on trade secrets, know-how, confidentiality agreements and continuing technological innovation to develop and maintain our competitive position. For example, some elements of manufacturing processes, proprietary assays, analytics techniques and processes, knowledge gained through clinical experience such as approaches to dosing and administration and management of patients, as well as related processes and software, are based on unpatented trade secrets and know-how that are not publicly disclosed. It is our policy to require our employees, consultants, outside scientific collaborators, sponsored researchers and other advisors to execute confidentiality agreements upon the commencement of employment or consulting relationships with us. These agreements provide that all confidential information concerning our business or financial affairs developed or made known to the individual or entity during the course of the party's relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. In the case of employees, the agreements provide that all inventions conceived of by the individual during the course of employment, and which relate to or are reasonably capable of being used in our current or planned business or research and development are our exclusive property. In addition, we take other appropriate precautions, such as physical and technological security measures, to guard against misappropriation of our proprietary technologies by third parties.

Trademarks

We also protect our brands through the procurement of trademark rights and have a portfolio of registered and pending trademark applications in the United States and abroad. As of December 31, 2024, the portfolio includes trademark applications for the mark NEUMORA, that are pending in the Canada and Mexico, and International Applications filed under the Madrid Protocol. Trademark applications for NEUMORA have been registered in Australia, Europe, India, Israel, Japan, China, South Korea, the United Kingdom, and the United States.

In-Licensing and Collaboration Agreements

*Exclusive License Agreements with Amgen for CK1*d *and GCase*

In September 2021, we entered into two exclusive license agreements with Amgen (the Amgen Licenses) with one of the agreements covering development of products directed to casein kinase 1 delta (the CK1d License) and the other covering development of products directed to ß- Glucocerebrosidase (the GCase License).

Under each Amgen License, Amgen granted to us a worldwide, exclusive, sublicensable license under certain of its patents and know-how to research, develop, manufacture, use and commercialize specified products containing compounds that, with respect to the CK1d License, are directed to CK1d, including compounds developed by us prior to the effective date of the CK1d License, and with respect to the GCase License, are directed to GCase, collectively referred to as the licensed products, for any and all uses. We have filed one patent application directed to CK1d. The license grants are subject to Amgen's right to use the licensed patents and know-how solely for internal research use. Until a specified period of time following the achievement of the first successful Phase 2 clinical trial for any licensed product, if we choose to sell, transfer, sublicense or divest rights to a licensed product in certain major markets, Amgen has a time-limited, exclusive right of first negotiation to enter into an agreement with us for such rights. Amgen also agreed to transfer to us certain licensed materials and licensed know-how relating to the licensed products.

Under each Amgen License, we are solely responsible for the research, development, manufacturing and commercialization of the licensed products. We are obligated to use commercially reasonable efforts to develop, manufacture, obtain regulatory approval, and commercialize at least one licensed product under each Amgen License. Under each Amgen License, we also agreed, until a specified period of time following the first commercial sale of the first licensed product in the United States, not to clinically develop, commercialize, or manufacture any compounds or products, other than the licensed products, that are directed to CK1d or GCase, unless we treat them as licensed products that are subject to diligence, milestone and royalty obligations under the Amgen Licenses. If we choose not to treat such compounds or products obtained through a transaction with a third party as a licensed product, then we are obligated to divest or terminate the program for such compounds or products.

Under the Amgen Licenses, we agreed to pay Amgen contingent consideration payable in cash up to an aggregate of $360.0 million in commercial milestone payments upon the achievement of certain sales thresholds per licensed product under the CK1d License and up to an aggregate $360.0 million in commercial milestone payments upon the achievement of certain sales thresholds per licensed product under the GCase License. We also agreed to pay tiered royalties at percentages ranging from the low to high-single-digits on annual worldwide net sales of licensed products under the CK1d License, and royalties at a low-single-digit percentage on annual worldwide net sales of licensed products under the GCase License, payable on a licensed product-by-licensed product and country-by-country basis until the later of the expiration of the last to expire licensed patent or Neumora patent claiming the composition of matter of such licensed product and the tenth anniversary of the first commercial sale of such licensed product in such country. Under each Amgen License, the royalty payments are subject to reductions on a country-by-country basis for lack of patent coverage, generic entry and payment obligations for third-party licenses. As of December 31, 2024, none of the milestones pursuant to the Amgen Licenses have been achieved and no amounts were recognized related to the contingent consideration milestones.

Each of the Amgen Licenses continues in force until the expiration of all royalty payment obligations to Amgen unless terminated earlier. We may terminate either Amgen License at-will with 30 days' prior written notice to Amgen at any time prior to the initiation of clinical development for any licensed product or 120 days' prior written notice to Amgen at any time thereafter. Either party may terminate either Amgen License upon written notice for the other party's material breach that remains uncured for ninety days (or for one year if an approved plan to remedy such breach is being diligently pursued) or upon the other party's bankruptcy or insolvency. Amgen may also terminate either Amgen License upon written notice if we breach our obligations to not clinically develop, commercialize or manufacture compounds or products directed to CK1d or GCase, other than licensed products, unless we treat them as licensed products or divest or terminate the program(s) for such compounds or products.

Upon termination of either of the Amgen Licenses, all rights and licenses granted by Amgen to us under that license will terminate, except that, under the CK1d License, we will retain rights to the compounds directed to CK1d that were developed by us prior to the effective date of the CK1d License. In addition, with respect to all other licensed products, at Amgen's election and in return for tiered royalties at percentages ranging from the low to mid-single-digits on annual worldwide net sales under the CK1d License, and royalties at a low-single-digit percentage on annual worldwide net sales under the GCase License, we will grant to Amgen an automatic, worldwide, perpetual, sublicensable, irrevocable and exclusive license to exploit such licensed products, under all patent rights and know-how controlled by us that cover such licensed products and are necessary to exploit any such licensed product as it exists as of the termination date.

In connection with the Amgen License Agreements and a since terminated research and collaboration agreement with Amgen entered into in September 2021, we issued to Amgen 20.0 million shares of our Series A-2 Preferred Stock. Additionally, Amgen purchased 12.7 million shares of our Series A-2 Preferred Stock at a purchase price of $7.85 per share, for total consideration of $100.0 million.

2015 TSRI License Agreement

In connection with the acquisition of BlackThorn in September 2020, we gained rights to a license agreement between BlackThorn and TSRI entered into in November 2015, as amended in November 2017 and April 2019 (2015 TSRI License Agreement). Pursuant to the 2015 TSRI License Agreement, TSRI granted us a worldwide, exclusive license under certain patent rights and a worldwide, non-exclusive license under certain know-how relating to TSRI's Kappa Opioid Receptor (KOR or navacaprant), V1aR Receptor (V1aR or NMRA-511) Antagonist and oxytocin receptors (OTR) positive allosteric modulator programs (collectively, the TSRI Programs), in each case that is sublicensable under certain conditions, to use, manufacture and commercialize products (i) that are covered by the relevant licensed patents, (ii) that involve the use or incorporation of the licensed know-how or (iii) that are KOR, V1aR or OTR modulators discovered by BlackThorn within two years of the effective date of the 2015 TSRI License Agreement for the diagnostic, prophylactic and/or therapeutic treatment of humans and animals. The last patent expiration date for the patents licensed pursuant to the TSRI 2015 License Agreement is 2038, excluding any patent term adjustment or patent term extension. The licensed patent rights are subject to TSRI's right to use the licensed patents for internal research and educational purposes and to grant non-exclusive licenses to other non-profit or academic institutions to use the licensed patent rights for internal research and educational purposes.

We are subject to certain research and development milestone timeline obligations and have agreed to use commercially reasonable efforts to obtain regulatory approvals and to commercialize the licensed products.

Under the 2015 TSRI License Agreement, BlackThorn issued TSRI shares of its capital stock representing one percent of all outstanding shares of its capital stock calculated on a fully diluted basis. We paid a change of control success fee to TSRI in shares of our Series A-1 convertible preferred stock with a fair value of $0.3 million. In December 2023, as part of the milestone payment under the BlackThorn Merger Agreement that became due upon the dosing of the first patient in the Phase 3 clinical trial for navacaprant, (1) we issued 50,903 shares of stock to TSRI as a success fee under the 2015 TSRI License Agreement and (2) we paid to TSRI $0.3 million as a milestone payment under the 2015 TSRI License Agreement. Beyond the payment of the change in control success fee, the success fee for the BlackThorn Merger Agreement milestone and the navacaprant milestone payment under the 2015 TSRI License Agreement, as of December 31, 2024, no other contingent consideration related to the milestones, royalty or other payments have been made to TSRI pursuant to the TSRI 2015 License Agreement.

We are obligated to pay TSRI a specified nominal annual license fee that is creditable against any royalties due for that calendar year. Upon achieving specified development and regulatory milestone events, we are obligated to pay TSRI milestone payments in the aggregate of up to $1.5 million for each TSRI Program and upon achieving specified commercial milestone events, we are obligated to pay TSRI milestone payments in the aggregate of up to $3.5 million for each occurrence. We are also obligated to pay TSRI a percentage in the mid-single digits of any sublicensing revenues we receive from a sublicensee. We also agreed to pay TSRI, on a product-by-product and country-by-country basis, royalties in the low-single digit percentages on worldwide net sales of products, which are either tiered or not tiered depending on the category of product, until the later of the expiration of the last to expire licensed patent in the world and the tenth anniversary of the first commercial sale of such licensed product in such country, subject to certain reductions for generic entry, lack of patent coverage and payment obligations for third-party licenses.

The 2015 TSRI License Agreement continues in force until the expiration of all royalty payment obligations to TSRI. We may terminate the 2015 TSRI License Agreement for any reason upon 90 days' prior written notice to TSRI. TSRI may immediately terminate the 2015 TSRI License Agreement if we fail to make a payment and do not cure within 20 days after written notice from TSRI, default on our indemnification or insurance obligations, become insolvent or bankrupt, are convicted of a felony relating to the development, manufacture, or commercialization of the licensed products, underpay by a certain percentage within any specified period of time, or default in the performance of any of our other obligations and fail to remedy the default within 60 days after written notice from TSRI. In the event we do not use commercially reasonable efforts to achieve the research and development milestones within the agreed upon time period and do not either meet the milestone or make substantial progress towards achieving the goals of the applicable research and development plan for such Program, in each case, within a specified cure period, TSRI has the right, based on the decision of an arbitrator, to either terminate the 2015 TSRI License Agreement with respect to a particular Program or terminate the 2015 TSRI License Agreement in its entirety. Upon any termination, all rights and licenses granted by TSRI to us will terminate. We also agreed to grant to TSRI, in return for royalties at a low-single-digit percentage of TSRI's net sales of licensed products, an irrevocable, exclusive, worldwide, perpetual, sublicensable license to data, information, or other materials exclusively controlled by us that directly relate to the licensed products, to research, develop, manufacture and commercialize the licensed products for the diagnostic, prophylactic and/or therapeutic treatment of humans and animals.

Vanderbilt License Agreement

Pursuant to the Vanderbilt License Agreement, we obtained an exclusive, worldwide, royalty-bearing, sublicensable (subject to certain restrictions) license under certain patent rights and a non-exclusive, worldwide, royalty-bearing, sub-licensable (subject to certain restrictions) license under certain know-how covering small molecule positive allosteric modulators (PAMs) predominantly of the muscarinic acetylcholine receptor subtype 4 (M4), to develop, manufacture and commercialize products, processes, and services covered by such patent rights or that incorporate or use such know-how, for any and all uses. The last patent expiration date for the licensed patents that are issued or expected to issue, from currently pending or provisional applications, pursuant to the Vanderbilt License Agreement is 2041, excluding any patent term adjustment or patent term extension. The licensed patent rights are subject to Vanderbilt's right to use the patent rights for research, internal non-commercial use and educational purposes.

We have agreed to use commercially reasonable efforts to develop and commercialize licensed products, and to achieve certain development milestones. Failure to meet our obligations in accordance with the Vanderbilt License Agreement to achieve such milestones may constitute a material breach of contract that entitles Vanderbilt to terminate the Vanderbilt License Agreement.

Under the Vanderbilt License Agreement, we paid an upfront fee of $13.0 million. We are also obligated to pay Vanderbilt tiered royalties at mid-single-digit percentages on net sales of royalty-bearing products, which are payable on a country-by-country and product-by-product basis until the later of expiration of the last to expire valid claim covering composition of matter in the licensed patents and the tenth anniversary of the first commercial sale of such product in such country. Under the Vanderbilt License Agreement, the royalty payments are subject to reductions on a country-by-country basis for the lack of patent coverage, generic entry and payment obligations for third-party licenses. In addition, we are obligated to pay Vanderbilt a low-double- digit percentage of sublicense income we receive for sublicenses entered into before the achievement of a specified event. We also agreed to pay Vanderbilt payments of up to $42.4 million upon achievement of specified development milestone events for NMRA-266, up to $42.0 million upon achievement of specified development milestone events for products other than NMRA-266, and up to $380.0 million upon achievement of specified commercial milestone events, but in no event will our total milestone payments to Vanderbilt exceed $422.4 million. In November 2023, a $2.0 million development milestone was paid to Vanderbilt under the Vanderbilt License Agreement. Also in November 2023, Neumora and Vanderbilt executed an option exercise notice pursuant to which we agreed to include within the scope of the exclusive license under the Vanderbilt License Agreement certain patent rights conceived or developed by Vanderbilt in the course of carrying out the sponsored research pursuant to a sponsored research agreement between us and Vanderbilt. As consideration for the exercise of this option, Neumora paid Vanderbilt $0.8 million in the fourth quarter of 2023. As of December 31, 2024, no other milestone, royalty or other payment (other than the upfront payment and development milestone described above) has become payable to Vanderbilt pursuant to the Vanderbilt License Agreement. In May 2024, the Company and Vanderbilt entered into a second sponsored research agreement with Vanderbilt and concurrently entered into an amendment to the Vanderbilt License Agreement (Second Amendment to the Vanderbilt License Agreement), to extend the rights granted to the Company under the Vanderbilt License Agreement to the data and patent rights conceived or developed by Vanderbilt in the course of carrying out the sponsored research pursuant to the second sponsored research agreement.

The Vanderbilt License Agreement will remain in force, on a country-by-country basis, until the expiration of all royalty payment obligations to Vanderbilt in such country. If we bring a patent challenge against any licensed patents, in addition to paying certain costs associated with the proceeding, Vanderbilt may convert the exclusive licenses to non-exclusive licenses or terminate the Vanderbilt License Agreement. If the licensed patents survive the patent challenge, all payments under the agreement will be increased by a specified amount. We have the right to terminate the Vanderbilt License Agreement at any time by providing Vanderbilt with 90 days' prior notice. Vanderbilt has the right to terminate the Vanderbilt License Agreement if we file for bankruptcy. The Vanderbilt License Agreement will automatically terminate if our insurance coverage lapses and is not cured within 90 days. Vanderbilt also has the right to terminate if we fail to make payments, breach our diligence obligations or breach any other material term upon 60 days prior notice.

Government Regulation

Government authorities in the United States, at the federal, state and local level, and other countries extensively regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, marketing and export and import of drug products. We, along with any third-party contractors, will be required to navigate the various preclinical, clinical and commercial approval requirements of the governing regulatory agencies of the countries in which we wish to conduct studies or seek approval of our products and product candidates. The process of obtaining regulatory approvals and the subsequent compliance with applicable federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources.

U.S. Drug Development Process

In the United States, the FDA regulates drugs under the federal Food, Drug, and Cosmetic Act (FDCA) and its implementing regulations. A new drug must be approved by the FDA through the New Drug Application (NDA) process before it may be legally marketed in the United States. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources. The process required by the FDA before a drug may be marketed in the United States generally involves the following:

- completion of certain preclinical laboratory tests, animal studies and formulation studies in accordance with FDA's Good Laboratory Practice (GLP) requirements and other applicable regulations;
- submission to the FDA of an IND, which must become effective before human clinical trials may begin;
- approval by an independent Institutional Review Board (IRB) or ethics committee at each clinical site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with good clinical practices (GCPs) to establish the safety and efficacy of the proposed drug for its intended use;
- preparation of and submission to the FDA of an NDA after completion of all pivotal trials;
- a determination by the FDA within 60 days of its receipt of an NDA to file the application for review;
- satisfactory completion of an FDA advisory committee review, if applicable;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the drug is produced to assess compliance with current Good Manufacturing Practice (cGMP) requirements to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity;
- potential inspection of selected clinical investigation sites to assess compliance with GCPs; and
- FDA review and approval of the NDA to permit commercial marketing of the product for particular indications for use in the United States.

Once a product candidate is identified for development, it enters the preclinical development stage. The preclinical developmental stage generally involves laboratory evaluations of chemistry, formulation and stability, as well as studies to evaluate the product candidate's toxicity in animals, in an effort to support subsequent clinical testing. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations for certain studies.

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

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control, in accordance with GCPs, which include the requirement that all research subjects provide their informed consent in writing for their participation in any clinical trial. Clinical trials must be conducted under protocols detailing, among other things, the objectives of the trial, dosing procedures, subject selection and exclusion criteria and the safety and effectiveness criteria to be evaluated. Each protocol must be submitted to the FDA as part of the IND, and a separate submission to the existing IND must be made for each successive clinical trial conducted during product development and for any subsequent protocol amendments. While the IND is active, progress reports summarizing the results of the clinical trials and nonclinical studies performed since the last progress report, among other information, must be submitted at least annually to the FDA, and written IND safety reports must be submitted to the FDA and investigators for serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the same or similar drugs, findings from animal or in vitro testing suggesting a significant risk to humans, and any clinically important increased incidence of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure.

Furthermore, an independent IRB at each institution participating in the clinical trial must review and approve review and approve each protocol before a clinical trial commences at that institution and must also approve the information regarding the trial and the consent form that must be provided to each trial subject or his or her legal representative, monitor the study until completed and otherwise comply with IRB regulations. Regulatory authorities, the IRB or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk or that the trial is unlikely to meet its stated objectives. In addition, some studies also include oversight by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board or committee. Depending on its charter, this group may determine whether a trial may move forward at designated check points based on access to certain data from the trial. There are also requirements governing the reporting of ongoing clinical studies and clinical trial results to public registries, including clinicaltrials.gov.

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

- Phase 1: The product candidate is initially introduced into healthy human subjects or patients with the target disease or condition. These studies are designed to test the safety, dosage tolerance, absorption, metabolism, excretion, and distribution of the investigational product in humans, the side effects associated with increasing doses, and, if possible, to gain early evidence on its effectiveness.
- Phase 2: The product candidate is administered to a limited patient population with a specified disease or condition identify possible adverse side effects and safety risks, to preliminarily evaluate the efficacy of the product candidate for specific targeted diseases and to determine dosage tolerance and appropriate dosage.
- Phase 3: The product candidate is administered to an expanded patient population to further evaluate dosage, to provide substantial evidence of 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 product candidate and provide an adequate basis for product labeling.

In some cases, the FDA may require, or sponsors may voluntarily pursue, additional clinical trials after a product is approved to gain more information about the product. These clinical trials, sometimes referred to as Phase 4, studies may be used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval of an NDA.

During the development of a new drug, sponsors are given opportunities to meet with the FDA at certain points. These points may be prior to submission of an IND, at the end of Phase 2, and before an NDA is submitted. Meetings at other times may be requested. These meetings can provide an opportunity for the sponsor to share information about the data gathered to date, for the FDA to provide advice, and for the sponsor and the FDA to reach alignment on the next phase of development.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the manufacturer must develop methods for testing the identity, strength, quality and purity of the final drug. In addition, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

U.S. Review and Approval Process

The results of product development, preclinical and other non-clinical studies and clinical trials, along with descriptions of the manufacturing process, analytical tests conducted on the chemistry of the drug, proposed labeling and other relevant information are submitted to the FDA as part of an NDA requesting approval to market the product. The submission of an NDA is subject to the payment of substantial user fees, unless a waiver or exemption applies.

The FDA conducts a preliminary review of all NDAs within the first 60 days after submission, before accepting them for filing, to determine whether they are sufficiently complete to permit substantive review The FDA may request additional information rather than accept an NDA for filing. In this event, the NDA must be resubmitted with the additional information. The resubmitted application also is subject to review before the FDA accepts it for filing. Once filed, reviews an NDA to determine, among other things, whether a product is safe and effective for its intended use and whether its manufacturing is cGMP-compliant to assure and preserve the product's identity, strength, quality and purity. Under the Prescription Drug User Fee Act (PDUFA) guidelines that are currently in effect, the FDA has a goal of ten months from the filing date to complete a standard review of an NDA for a drug that is a new molecular entity. This review typically takes twelve months from the date the NDA is submitted to FDA because the FDA has approximately two months to make a "filing" decision after it the application is submitted.

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

Before approving an NDA, the FDA will typically inspect the facility or facilities where the product is manufactured. Additionally, before approving an NDA, the FDA may inspect one or more clinical trial sites to assure compliance with GCPs.

After the FDA evaluates an NDA and conducts inspections of manufacturing facilities where the investigational product and/or its drug substance will be produced, the FDA may issue an approval letter or a Complete Response Letter (CRL). An approval letter authorizes commercial marketing of the drug with prescribing information for specific indications. A CRL indicates that the review cycle of the application is complete, and the application will not be approved in its present form. A CRL usually describes the specific deficiencies in the NDA identified by the FDA and may require additional clinical data, such as an additional clinical trial or other significant and time-consuming requirements related to clinical trials, nonclinical studies or manufacturing. If a CRL is issued, the sponsor must resubmit the NDA or, addressing all of the deficiencies that the FDA has identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the NDA does not satisfy the criteria for approval.

If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. In addition, the FDA may require a sponsor to conduct post-market, clinical trials designed to further assess a drug's safety and/or effectiveness after NDA approval, and may require additional testing and surveillance programs to monitor the safety of approved products which have been commercialized. The FDA may also place other conditions on approval including the requirement for a risk evaluation and mitigation strategy (REMS), to assure the safe use of the drug. If the FDA concludes a REMS is needed, the sponsor of the NDA must submit a proposed REMS, which could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA will not approve the NDA without an approved REMS, if required. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products.

In addition, the Pediatric Research Equity Act (PREA) requires a sponsor to conduct pediatric clinical trials for most drugs, for a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration. Under PREA, original NDAs and supplements must contain a pediatric assessment unless the sponsor has received a deferral or waiver. The required assessment must evaluate the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The sponsor or FDA may request a deferral of pediatric clinical trials for some or all of the pediatric subpopulations. A deferral may be granted for several reasons, including a finding that the drug is ready for approval for use in adults before pediatric clinical trials are complete or that additional safety or effectiveness data needs to be collected before the pediatric clinical trials begin. The FDA must send a non-compliance letter to any sponsor that fails to submit the required assessment, keep a deferral current or fails to submit a request for approval of a pediatric formulation.

Expedited Development and Review Programs

The FDA offers a number of programs intended to expedite the development or review of a marketing application for a drug product. For example, the Fast Track program is intended to expedite or facilitate the process for developing and reviewing product candidates that are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. Fast Track designation applies to the combination of the product and the specific indication for which it is being studied. The sponsor of a Fast Track product candidate has opportunities for more frequent interactions with the applicable FDA review team during development and, once an NDA is submitted, the application may be eligible for priority review. An NDA for a Fast Track product candidate may also be eligible for rolling review, where the FDA may consider for review sections of the NDA on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA, the FDA agrees to accept sections of the NDA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA.

A product candidate intended to treat a serious or life-threatening disease or condition may also be eligible for Breakthrough Therapy designation to expedite its development and review. A product candidate can receive Breakthrough Therapy designation if preliminary clinical evidence indicates that the product candidate, alone or in combination with one or more other drugs, may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The designation includes all of the Fast Track program features, as well as more intensive FDA interaction and guidance beginning as early as Phase 1 and an organizational commitment to expedite the development and review of the product candidate, including involvement of senior managers.

Any marketing application for a drug submitted to the FDA for approval, including a product candidate with a Fast Track designation and/or Breakthrough Therapy designation, may be eligible for other types of FDA programs intended to expedite the development and review processes, such as priority review. An NDA is eligible for priority review if the product candidate is designed to treat a serious condition, and if approved, would provide a significant improvement in safety or effectiveness compared to available alternatives for such disease or condition. For new-molecular-entity NDAs, priority review designation means the FDA's goal is to take action on the marketing application within six months of the 60-day filing date, as compared to ten months for review of new-molecular-entity NDAs under its current PDUFA review goals.

Additionally, depending on the design of the applicable clinical trials, product candidates studied for their safety and effectiveness in treating serious or life-threatening diseases or conditions may be eligible for accelerated approval upon a determination that the product candidate has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefits, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. As a condition of continued approval, the FDA will generally require the sponsor to perform adequate and well-controlled confirmatory clinical studies to verify and describe the anticipated effect on irreversible morbidity or mortality or other clinical benefits, and may require that such confirmatory trials be underway prior to granting accelerated approval. Products receiving accelerated approval may be subject to expedited withdrawal procedures if the sponsor fails to conduct the required confirmatory studies in a timely manner or if such studies fail to verify the predicted clinical benefit. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product.

Fast Track designation, Breakthrough Therapy designation, priority review, and accelerated approval do not change the standards for approval, but may expedite the development or approval process. Even if a product candidate qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Orphan Drug Designation and Exclusivity

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug intended to treat a rare disease or condition, defined as a disease or condition with a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 individuals in the United States and when there is no reasonable expectation that the cost of developing and making available the drug in the United States will be recovered from sales in the United States for that drug. Orphan drug designation must be requested before submitting an NDA. After the FDA grants orphan drug designation, the generic identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. Orphan designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product that has orphan drug designation subsequently receives the first FDA approval for a particular active ingredient for the disease or condition for which it has such designation, the product is entitled to orphan product exclusivity, which means that the FDA may not approve any other applications, including a full NDA, to market the same drug for the same disease or condition for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity or if the FDA finds that the holder of the orphan drug exclusivity has not shown that it can assure the availability of sufficient quantities of the orphan drug to meet the needs of patients with the disease or condition for which the drug was designated. Orphan drug exclusivity does not prevent the FDA from approving a different drug for the same disease or condition, or the same drug for a different disease or condition. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the NDA application user fee.

A designated orphan drug may not receive orphan drug exclusivity if it is approved for a use that is broader than the disease or condition for which it received orphan designation. In addition, orphan drug exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or, as noted above, if a second applicant demonstrates that its product is clinically superior to the approved product with orphan exclusivity 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.

Post-approval Requirements

Any products manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to record-keeping, reporting of adverse experiences, periodic reporting, product sampling and distribution, and advertising and promotion of the product. After approval, most changes to the approved product, such as adding new indications, certain manufacturing changes and additional labeling claims, are subject to further FDA review and approval. There also are continuing, annual program fees for any marketed products. Drug manufacturers and their subcontractors are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMPs and other laws and regulations. Changes to the manufacturing process are strictly regulated, and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting requirements. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of requirements for post-market studies or clinical studies to assess new safety risks; or imposition of distribution restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

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

The FDA closely regulates the marketing, labeling, advertising and promotion of drug products. A company can make only those claims relating to safety and efficacy that are approved by the FDA and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. Physicians may prescribe, in their independent professional medical judgment, legally available products for uses that are not described in the product's labeling and that differ from those tested and approved by the FDA. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, restrict manufacturer's communications on the subject of off-label use of their products. However, companies may share truthful and not misleading information that is otherwise consistent with a product's FDA-approved labeling.

Marketing Exclusivity

Market exclusivity provisions under the FDCA can delay the submission or the approval of certain marketing applications. The FDCA provides a five-year period of non-patent data exclusivity within the United States to the first applicant to obtain approval of an NDA for a new chemical entity. A drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance. During the exclusivity period, the FDA may not approve or even accept for review an abbreviated new drug application (ANDA) or an NDA submitted under Section 505(b)(2) (505(b)(2) NDA) submitted by another company for another drug based on the same active moiety, regardless of whether the drug is intended for the same indication as the original innovative drug or for another indication, where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement to one of the patents listed with the FDA by the innovator NDA holder.

The FDCA alternatively provides three years of non-patent exclusivity for an NDA, or supplement to an existing NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example new indications, dosages or strengths of an existing drug. This three-year exclusivity covers only the modification for which the drug received approval on the basis of the new clinical investigations and does not prohibit the FDA from approving ANDAs or 505(b)(2) NDAs for drugs containing the active agent for the original indication or condition of use. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

Pediatric exclusivity is another type of marketing exclusivity available in the United States. Pediatric exclusivity provides for an additional six months of marketing exclusivity attached to another period of regulatory exclusivity or existing patent term if a sponsor conducts clinical trials in children in response to a written request from the FDA. The issuance of a written request does not require the sponsor to undertake the described clinical trials.

Other U.S. Regulatory Requirements

In addition to FDA regulation of pharmaceutical products, pharmaceutical companies are also subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which they conduct their business and may constrain the financial arrangements and relationships through which we research, as well as sell, market and distribute any products for which we obtain marketing authorization. Such laws include, without limitation, state and federal anti-kickback, fraud and abuse, false claims, and transparency laws and regulations related to drug pricing and payments and other transfers of value made to physicians and other healthcare providers. If their operations are found to be in violation of any of such laws or any other governmental regulations that apply, they may be subject to penalties, including, without limitation, administrative, civil and criminal penalties, damages, fines, disgorgement, the curtailment or restructuring of operations, integrity oversight and reporting obligations, exclusion from participation in federal and state healthcare programs and imprisonment.

Foreign Government Regulation

To market any product outside of the United States, 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 (MA), commercial sales and distribution of our products. The foreign regulatory approval process includes all of the risks associated with FDA approval set forth above, as well as additional country-specific regulation.

Whether or not we obtain FDA approval for a product, we must obtain approval of a product by the comparable regulatory authorities of foreign countries before we can commence clinical trials or marketing of the product in those countries. Approval by one regulatory authority does not ensure approval by regulatory authorities in other jurisdictions. The approval process varies from country to country, can involve additional testing beyond that required by FDA, and may be longer or shorter than that required for FDA approval. The requirements governing the conduct of clinical trials, product licensing, pricing, promotion, and reimbursement vary greatly from country to country.

Non-clinical Studies and Clinical Trials

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

Non-clinical studies are performed to demonstrate the health or environmental safety of new chemical or biological substances. Non-clinical (pharmaco-toxicological) studies must be conducted in compliance with the principles of good laboratory practice (GLP) as set forth in EU Directive 2004/10/EC (unless otherwise justified for certain particular medicinal products, e.g., radio-pharmaceutical precursors for radio-labeling purposes). In particular, non-clinical studies, both in vitro and in vivo, must be planned, performed, monitored, recorded, reported and archived in accordance with the GLP principles, which define a set of rules and criteria for a quality system for the organizational process and the conditions for non-clinical studies. These GLP standards reflect the Organization for Economic Co-operation and Development requirements.

Clinical trials of medicinal products in the EU must be conducted in accordance with EU and national regulations and the International Council for Harmonization of Technical Requirements for Pharmaceuticals for Human Use (ICH) guidelines on Good Clinical Practices (GCP) as well as the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki. If the sponsor of the clinical trial is not established within the EU, it must appoint an EU entity to act as its legal representative. The sponsor must take out a clinical trial insurance policy, and in most EU member states, the sponsor is liable to provide ‘no fault’ compensation to any study subject injured in the clinical trial.

The regulatory landscape related to clinical trials in the EU has been subject to recent changes. The EU Clinical Trials Regulation (CTR) which was adopted in April 2014 and repeals the EU Clinical Trials Directive, became applicable on January 31, 2022. Unlike directives, the CTR is directly applicable in all EU member states without the need for member states to further implement it into national law. The CTR notably harmonizes the assessment and supervision processes for clinical trials throughout the EU via a Clinical Trials Information System, which contains a centralized EU portal and database.

While the Clinical Trials Directive required a separate clinical trial application (CTA) to be submitted in each member state in which the clinical trial takes place, to both the competent national health authority and an independent ethics committee, much like the FDA and IRB respectively, the CTR introduces a centralized process and only requires the submission of a single application for multi-center trials. The CTR allows sponsors to make a single submission to both the competent authority and an ethics committee in each member state, leading to a single decision per member state. The CTA must include, among other things, a copy of the trial protocol and an investigational medicinal product dossier containing information about the manufacture and quality of the medicinal product under investigation. The assessment procedure of the CTA has been harmonized as well, including a joint assessment by all member states concerned, and a separate assessment by each member state with respect to specific requirements related to its own territory, including ethics rules. Each member state’s decision is communicated to the sponsor via the centralized EU portal. Once the CTA is approved, clinical study development may proceed.

The CTR transition period ended on January 31, 2025, and all clinical trials (and related applications) are now fully subject to the provisions of the CTR.

Medicines used in clinical trials must be manufactured in accordance with Good Manufacturing Practice (GMP). Other national and EU-wide regulatory requirements may also apply.

Marketing Authorization

In order to market our product candidates in the EU and many other foreign jurisdictions, we must obtain separate regulatory approvals. More concretely, in the EU, medicinal product candidates can only be commercialized after obtaining an MA. To obtain regulatory approval of a product candidate under EU regulatory systems, we must submit a MA application (MAA). The process for doing this depends, among other things, on the nature of the medicinal product. There are two types of MAs:

- "Centralized MAs" are issued by the European Commission through the centralized procedure based on the opinion of the Committee for Medicinal Products for Human Use (CHMP) of the European Medicines Agency (EMA) and are valid throughout the EU. The centralized procedure is compulsory for certain types of medicinal products such as (i) medicinal products derived from biotechnological processes, (ii) designated orphan medicinal products, (iii) advanced therapy medicinal products (ATMPs) (such as gene therapy, somatic cell therapy and tissue engineered products) and (iv) medicinal products containing a new active substance indicated for the treatment of certain diseases, such as HIV/AIDS, cancer, diabetes, neurodegenerative diseases or autoimmune diseases and other immune dysfunctions, and viral diseases. The centralized procedure is optional for products containing a new active substance not yet authorized in the EU, or for products that constitute a significant therapeutic, scientific or technical innovation or which are in the interest of public health in the EU.
- "National MAs" are issued by the competent authorities of the EU member states, only cover their respective territory, and are available for product candidates not falling within the mandatory scope of the centralized procedure. Where a product has already been authorized for marketing in an EU member state, this national MA can be recognized in another member state through the mutual recognition procedure. If the product has not received a national MA in any member state at the time of application, it can be approved simultaneously in various member states through the decentralized procedure. Under the decentralized procedure an identical dossier is submitted to the competent authorities of each of the member states in which the MA is sought, one of which is selected by the applicant as the reference member state.

Under the centralized procedure the maximum timeframe for the evaluation of an MAA by the European Medicine Agency (EMA) is 210 days, excluding clock stops.

Under the above-described procedures, in order to grant the MA, the EMA or the competent authorities of the EU member states make an assessment of the risk benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy. MAs have an initial duration of five years. After these five years, the authorization may be renewed on the basis of a reevaluation of the risk-benefit balance.

The aforementioned EU rules are generally applicable in the European Economic Area (EEA) which consists of the 27 EU member states plus Norway, Liechtenstein and Iceland.

Failure to comply with EU and member state laws that apply to the conduct of clinical trials, manufacturing approval, MA of medicinal products and marketing of such products, both before and after grant of the MA, manufacturing of pharmaceutical products, statutory health insurance, bribery and anti-corruption or with other applicable regulatory requirements may result in administrative, civil or criminal penalties. These penalties could include delays or refusal to authorize the conduct of clinical trials, or to grant MA, product withdrawals and recalls, product seizures, suspension, withdrawal or variation of the MA, total or partial suspension of production, distribution, manufacturing or clinical trials, operating restrictions, injunctions, suspension of licenses, fines and criminal penalties.

Brexit and the Regulatory Framework in the United Kingdom

Following the end of the Brexit transition period on January 1, 2021 and the implementation of the Windsor Framework on January 1, 2025, the United Kingdom (UK) is not generally subject to EU laws with respect to medicines. The EU laws that have been transposed into UK law through secondary legislation remain applicable in the UK, however, new legislation such as the (EU) CTR is not applicable in the UK.

Under the Medicines and Medical Devices Act 2021, the Secretary of State or an 'appropriate authority' has delegated powers to amend or supplement existing regulations in the area of medicinal products and medical devices. This allows new rules to be introduced in the future by way of secondary legislation, which aims to allow flexibility in addressing regulatory gaps and future changes in the fields of human medicines, clinical trials and medical devices.

Since January 1, 2021, the Medicines and Healthcare products Regulatory Agency (MHRA) is the UK's standalone medicines and medical devices regulator. As a result of the Ireland/Northern Ireland protocol, different rules apply in Northern Ireland than in England, Wales, and Scotland, together, Great Britain (GB),which continued to follow the EU regulatory regime. However, on January 1, 2025 a new arrangement called the "Windsor Framework" came into effect and reintegrated Northern Ireland under the regulatory authority of the MHRA with respect to medicinal products. The Windsor Framework removes EU licensing processes and EU labelling and serialization requirements in relation to Northern Ireland and introduces a UK-wide licensing process for medicines.

The UK regulatory framework in relation to clinical trials is governed by the Medicines for Human Use (Clinical Trials) Regulations 2004, as amended, which is derived from the CTD, as implemented into UK national law through secondary legislation. On January 17, 2022, the MHRA launched an eight-week consultation on reframing the UK legislation for clinical trials, and which aimed to streamline clinical trials approvals, enable innovation, enhance clinical trials transparency, enable greater risk proportionality, and promote patient and public involvement in clinical trials. The MHRA published its consultation outcome on March 21, 2023 confirming that it would bring forward changes to the legislation. The resulting legislative amendments, which are yet to be published, will ultimately determine the extent to which the UK regulations align with the (EU) CTR. In October 2023, the MHRA announced a new Notification Scheme for clinical trials which enables a more streamlined and risk-proportionate approach to initial clinical trial applications for Phase 4 and low-risk Phase 3 clinical trial applications.

Marketing authorizations in the UK are governed by the Human Medicines Regulations (SI 2012/1916), as amended. All existing EU MAs for centrally authorized products were automatically converted or grandfathered into UK MAs, effective in GB (only), free of charge on January 1, 2021, unless the MA holder opted-out. Under the terms of the Windsor Framework, these licenses became valid for the whole of the UK from January 1, 2025. In order to use the centralized procedure to obtain a MA that will be valid throughout the EEA, companies must be established in the EEA. Therefore since Brexit, companies established in the UK can no longer use the EU centralized procedure and instead an EEA entity must hold any centralized MAs. In order to obtain a UK MA to commercialize products in the UK, an applicant must be established in the UK and must follow one of the UK national authorization procedures or one of the remaining post-Brexit international cooperation procedures. Applications are governed by the Human Medicines Regulations (SI 2012/1916) and are made electronically through the MHRA Submissions Portal. The MHRA has introduced changes to national licensing procedures, including procedures to prioritize access to new medicines that will benefit patients, a 150-day assessment (subject to clock-stops) and a rolling review procedure. The rolling-review procedure permits the separate or joint submission of quality, non-clinical, and clinical data to the MHRA which can be reviewed on a rolling basis. After an application under the rolling-review procedure has been validated, the decision should be received within 100 days (subject to clock-stops). In addition, since January 1, 2024, the MHRA may rely on the International Recognition Procedure (IRP), when reviewing certain types of MAAs. Pursuant to the IRP, the MHRA will take into account the expertise and decision-making of trusted regulatory partners (e.g. the regulatory in Australia, Canada, Switzerland, Singapore, Japan, the U.S.A. and the EU). The MHRA will conduct a targeted assessment of IRP applications but retain the authority to reject applications if the evidence provided is considered insufficiently robust. The IRP allows medicinal products approved by such trusted regulatory partners that meet certain criteria to undergo a fast-tracked MHRA review to obtain and/or update a MA in the UK or Great Britain. Applications should be decided within a maximum of 60 days if there are no major objections identified that cannot be resolved within such 60 day period and the approval from the trusted regulatory partner selected has been granted within the previous 2 years or if there are such major objections identified or such approval hasn't been granted within the previous 2 years within 110 days. Applicants can submit initial MAAs to the IRP but the procedure can also be used throughout the lifecycle of a product for post-authorization procedures including line extensions, variations and renewals.

In the UK, the initial duration of an MA is five years and following renewal will be valid for an unlimited period unless the MHRA decides on justified grounds relating to pharmacovigilance, to proceed with only one additional five-year renewal. Any authorization which is not followed by the actual placing of the drug on the market in the UK within three (3) years shall ease to be in force.

There will be no pre-MA orphan designation. Instead, the MHRA will review applications for orphan designation in parallel to the corresponding MA application. The criteria are essentially the same, but have been tailored for the market, i.e., the prevalence of the condition in GB, rather than the EU, must not be more than five in 10,000. Should an orphan designation be granted, the period or market exclusivity will be set from the date of first approval of the product in GB.

Coverage and Reimbursement

Sales of any product depend, in part, on the extent to which such product will be covered by third-party payors, such as federal, state and foreign government healthcare programs, commercial insurance and managed healthcare organizations, and the level of reimbursement for such product by third-party payors. Decisions regarding the extent of coverage and amount of reimbursement to be provided are made on a plan-by-plan basis. These third-party payors are increasingly reducing reimbursements for medical products, drugs and services. In addition, the U.S. government, state legislatures and foreign governments have continued implementing cost-containment programs, including price controls, restrictions on coverage and reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit sales of any product.

Decreases in third-party reimbursement for any product or a decision by a third-party payor not to cover a product could reduce physician usage and patient demand for the product and also have a material adverse effect on sales.

Healthcare Reform

In the United States, there have been, and continue to be, legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of product candidates, restrict or regulate post-approval activities, and affect the profitable sale of product candidates, and similar healthcare laws and regulations exist in the EU and other jurisdictions. Among policy makers and payors in the United States, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives.

By way of example, in March 2010, the Patient Protection and Affordable Care Act (the ACA) was passed, which substantially changed the way healthcare is financed by both governmental and private insurers, and significantly affected the pharmaceutical industry. The ACA, among other things, increased the minimum level of Medicaid rebates payable by manufacturers of brand name drugs from 15.1% to 23.1% of the average manufacturer price; required collection of rebates for drugs paid by Medicaid managed care organizations; imposed a non-deductible annual fee on pharmaceutical manufacturers or importers who sell certain "branded prescription drugs" to specified federal government programs; implemented a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs that are inhaled, infused, instilled, implanted, or injected; expanded eligibility criteria for Medicaid programs; created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; and established a Center for Medicare and Medicaid Innovation at the CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

Since its enactment, there have been judicial, executive and political challenges to certain aspects of the ACA. On June 17, 2021, the U.S. Supreme Court dismissed the most recent judicial challenge to the ACA brought by several states without specifically ruling on the constitutionality of the ACA. On August 16, 2022, President Biden signed the Inflation Reduction Act of 2022 (the IRA) into law, which, among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in ACA marketplaces through plan year 2025. It is unclear how other healthcare reform measures, if any, will impact our business.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. For example, on March 11, 2021, President Biden signed the American Rescue Plan Act of 2021 into law, which eliminated the statutory Medicaid drug rebate cap, beginning January 1, 2024. The rebate was previously capped at 100% of a drug's average manufacturer price. Further, in August 2011, the Budget Control Act of 2011, among other things, included aggregate reductions to Medicare payments to providers, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, will remain in effect until 2032, with the exception of a temporary suspension from May 1, 2020 through March 31, 2022, unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Moreover, heightened governmental scrutiny is likely to continue over the manner in which manufacturers set prices for their marketed products, which already has resulted in several Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for pharmaceutical products. Most recently, the IRA marks the most significant action by Congress with respect to the pharmaceutical industry since the adoption of the ACA in 2010. Among other things, the IRA requires manufacturers of certain drugs to engage in price negotiations with Medicare (beginning in 2026), imposes rebates under Medicare Part B and Medicare Part D to penalize price increases that outpace inflation (first due in 2023), and replaces the Part D coverage gap discount program with a new discounting program (which began on January 1, 2025). Manufacturers that fail to comply with the IRA may be subject to various penalties, including civil monetary penalties. The IRA permits the Secretary of the Department of Health and Human Services (HHS) to implement many of these provisions through guidance, as opposed to regulation, for the initial years. On August 15, 2024, HHS announced the agreed upon prices of the first ten drugs that are subject to price negotiations, which take effect in January 2026. HHS will select up to fifteen additional products covered under Part D for negotiations in 2025. Each year thereafter, more Part B and Part D products will become subject to HHS price negotiation program, although the program is currently subject to legal challenges. For that and other reasons, it is currently unclear how the IRA will be effectuated, and while the impact of the IRA on the pharmaceutical industry cannot yet be fully determined, it is likely to be significant.

Individual states in the United States have also become increasingly active in implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing.

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 products once approved or additional pricing pressures. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our product candidates.

Data Privacy and Security

Numerous state, federal and foreign laws, regulations and standards govern the collection, use, access to, confidentiality and security of health- related and other personal information, including clinical trial data, and could apply now or in the future to our operations or the operations of our partners. In the United States, numerous federal and state laws and regulations, including data breach notification laws, health information privacy and security laws and consumer protection laws and regulations govern the collection, use, disclosure and protection of health-related and other personal information. Further, to the extent we collect personal data from individuals outside of the United States, through clinical trials or otherwise, we could be subject to foreign laws, such as the GDPR, which govern the privacy and security of personal data, including health-related data. Our use of AI/ML may also be subject to evolving laws and regulations, controlling for data bias and anti-discrimination. Privacy and security laws, regulations and other obligations are constantly evolving, may conflict with each other to complicate compliance efforts, and can result in investigations, proceedings, or actions that lead to significant civil and/or criminal penalties and restrictions on data processing.

Commercialization

We intend to retain significant development and commercial rights to our product candidates and, if marketing approval is obtained, we may commercialize our product candidates on our own, or potentially with a partner, in the United States and other geographies. We currently have no sales, marketing or commercial product distribution capabilities. We may build the necessary infrastructure and capabilities over time for the United States, and potentially other regions, though like all things we do, we would seek to leverage technology to build these capabilities over time to be significantly more efficient than the industry average. Decisions to create this infrastructure and capability will be made following further advancement of our product candidates and based on our assessment of our ability to build said capabilities and infrastructure with competitive advantage. Clinical data, the size of the addressable patient population, the size of the commercial infrastructure, manufacturing needs and major trends as to how value is accrued in the industry may all influence or alter our commercialization plans.

Manufacturing

We do not own or operate any manufacturing facilities. We currently depend on and expect to continue to depend on third-party contract manufacturing organizations (CMOs) for all of our requirements of raw materials, drug substance and drug product for our preclinical research and clinical trials of our product candidates. Certain of these CMOs, including the drug substance supplier for our navacaprant (Almac) and the drug product suppliers for our navacaprant (Almac) and NMRA-511 (Aptuit) programs, are single-source suppliers. None of these single-source suppliers have the ability to terminate these agreements for convenience and there are no minimum purchase commitments. We intend to continue to rely on CMOs for later-stage development and commercialization of our product candidates, including any additional product candidates that we may identify. Although we rely on CMOs, we have personnel and third-party consultants with extensive manufacturing experience to oversee the relationships with our contract manufacturers.

Competition

Neumora is a clinical-stage biopharmaceutical company founded to confront the global brain disease crisis by taking a fundamentally different approach to the way treatments for brain diseases are developed. Our efforts to date have resulted in a pipeline of seven clinical and preclinical precision neuroscience programs targeting a broad range of underserved neuropsychiatric disorders and neurodegenerative diseases. The foundation of our approach is an integration between our portfolio of therapeutic candidates with novel mechanisms of action and our precision neuroscience approach, supported by our Precision Toolbox of translational neuroscience tools, methods, and data science capabilities. As such, we compete with multiple biopharmaceutical and biotechnology companies that are similarly working to develop therapeutics targeting neuropsychiatric disorders and neurodegenerative diseases. While we believe we have the competitive advantages referred to above, we face competition from major biopharmaceutical and biotechnology companies, academic institutions, governmental agencies, consortiums and public and private research institutions, among others, many of whom have significantly greater resources than us. Notable competitors include traditional biopharmaceutical and biotechnology companies targeting brain diseases such as Axsome Therapeutics; Denali Therapeutics; Neurocrine Biosciences; Prothena Corporation; and Xenon Pharmaceuticals.

Facilities

Our corporate headquarters are located in Watertown, Massachusetts, where we sublease approximately 31,000 square feet of office and laboratory space pursuant to a sublease agreement that expires in June 2025.

We believe that our existing facilities are sufficient for our near-term needs but expect to need additional space as we grow. We believe that suitable additional alternative spaces will be available in the future on commercially reasonable terms, if required.

Employees and Human Capital Resources

As of December 31, 2024, we had 110 full-time employees, 67 of whom were primarily engaged in research and development activities. A total of 69 employees held an advanced degree. None of our employees are represented by a labor union or party to a collective bargaining agreement. We consider our relationship with our employees to be good.

Our human capital resources objectives include, as applicable, identifying, recruiting, retaining, incentivizing and integrating our existing and additional employees. The principal purposes of our equity incentive plans are to attract, retain and motivate selected employees, consultants and directors through the granting of stock-based compensation awards and cash-based performance bonus awards.

ITEM 1A. Risk Factors.

RISK FACTORS

Investing in shares of our common stock involves a high degree of risk. You should carefully consider the following risks and uncertainties, together with all of the other information contained in this Annual Report on Form 10-K, including our audited consolidated financial statements and related notes and the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations," before making an investment decision. The risks described below are not the only ones facing us. Many of the following risks and uncertainties are, and will be, exacerbated by any worsening of the global business and economic environment. The occurrence of any of the following risks, or of additional risks and uncertainties not presently known to us or that we currently believe to be immaterial, could materially and adversely affect our business, financial condition, reputation, or results of operations. In such case, the trading price of shares of our common stock could decline, and you may lose all or part of your investment.

Summary Risk Factors

- We are a clinical-stage biopharmaceutical company and have incurred significant losses since our inception, and we expect to incur losses for the foreseeable future. We have no products approved for commercial sale and may never achieve or maintain profitability.
- Our substantial contingent consideration and related obligations from our acquisitions of assets and license and collaboration agreements may result in dilution to our stockholders, may be a drain on our cash resources, or may cause us to incur debt obligations to satisfy the payment obligations.
- Our limited operating history may make it difficult to evaluate our prospects and likelihood of success.
- We will require additional funding in order to finance operations. If we are unable to raise capital when needed, or on acceptable terms, we could be forced to delay, reduce or eliminate our product development programs or commercialization efforts.
- If we are unable to successfully identify, develop and commercialize any product candidates, or experience significant delays in doing so, our business, financial condition and results of operations will be materially adversely affected.
- We were founded with a mission to redefine neuroscience drug development, a field that has seen very limited success. The ability to successfully develop drugs in this field is extremely difficult and is subject to a number of unique challenges.
- We have invested and expect to continue to invest in acquiring product candidates, technologies and assets, as well as research and development efforts that further enhance our product pipeline. Such investments may affect our operating results, and, if the return on these investments is lower or develops more slowly than we expect, our revenue and operating results may suffer.
- We have experienced rapid growth since our inception in November 2019. If we fail to effectively manage our growth, we may not be able to execute on our business objectives.
- We operate in highly competitive and rapidly changing industries, which may result in others discovering, developing or commercializing competing products before or more successfully than we do.
- Clinical and preclinical drug development is a lengthy and expensive process, with an uncertain outcome. Our clinical and preclinical programs have experienced delays and may experience additional delays or may never advance, which would adversely affect our ability to obtain regulatory approvals or commercialize our product candidates on a timely basis or at all, which could have an adverse effect on our business.
- The development and commercialization of drug products is subject to extensive regulation, and the regulatory approval processes of the FDA and comparable foreign authorities are lengthy, time-consuming, and inherently unpredictable. If we are ultimately unable to obtain regulatory approval for our product candidates on a timely basis or at all, our business will be substantially harmed.
- We depend on intellectual property licensed from third parties and we are currently party to in-license agreements under which we acquired rights to use, develop, manufacture and/or commercialize certain of our proprietary technologies and product candidates. If we breach our obligations under these agreements or if any of these agreements is terminated, or otherwise experience disruptions to our business relationships with our licensors, we may be required to pay damages, lose our rights to such intellectual property and technology, or both, which would harm our business.

Risks Related to Our Limited Operating History, Financial Condition and Need for Additional Capital

We are a clinical-stage biopharmaceutical company and have incurred significant losses since our inception, and we expect to incur losses for the foreseeable future. We have no products approved for commercial sale and may never achieve or maintain profitability.

We are a clinical-stage biopharmaceutical company with a limited operating history. Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of risk. We have incurred significant losses since our inception in November 2019, have no products approved for commercial sale, have not generated any revenue from product sales, have financed our operations principally through proceeds from sales of common stock, convertible preferred stock and convertible promissory notes and expect to incur significant losses for the foreseeable future. We expect that it will be several years before we have a commercialized product and generate revenue from product sales, if at all. As of December 31, 2024, we had an accumulated deficit of $947.2 million. Our losses have resulted principally from acquired in-process research and development from our acquisitions of assets, expenses incurred in the research and development of our product candidates, as well as from costs associated with our preclinical studies and clinical trials and management and administrative costs and other expenses that we have incurred while building our business infrastructure.

We expect our expenses and operating losses will continue to increase substantially for the foreseeable future as we expand our research and development efforts, advance our clinical candidates to potentially registrational trials, identify and acquire product candidates, complete preclinical studies and initiate additional clinical trials, seek regulatory approval and commercialization of our product candidates and operate as a public company. We anticipate that our expenses will continue to increase substantially as we:

- continue clinical and preclinical development of our current and future product candidates and initiate additional preclinical studies and clinical trials;
- seek regulatory approval of our current and future product candidates;
- acquire additional product candidates, technologies, multimodal patient datasets and other assets for our business;
- expand our operational, financial and management systems and increase personnel, including personnel to support our clinical and preclinical development, manufacturing and commercialization efforts;
- continue to develop, perfect, maintain and defend our intellectual property portfolio; and
- incur additional legal, accounting or other expenses in operating our business, including the additional costs associated with operating as a public company.

We have devoted a significant portion of our financial resources and efforts to building our organization, acquiring technologies and companies, executing clinical and preclinical studies, conducting research and development, identifying and developing potential product candidates, building our precision neuroscience approach, organizing and staffing our company, business planning, establishing, maintaining and protecting our intellectual property portfolio, raising capital and providing general and administrative support for these operations. We have not completed development and commercialization of any of our product candidates with most still being in relatively early development.

To become and remain profitable, we must succeed in identifying, developing, conducting successful clinical trials, obtaining regulatory approval for, and eventually commercializing, products that generate significant revenue. This will require us to be successful in a range of challenging activities, including completing preclinical studies and clinical trials of our product candidates, continuing to discover and develop additional product candidates, obtaining regulatory and marketing approval for any product candidates that successfully complete clinical trials, accessing manufacturing capacity, establishing marketing capabilities, commercializing and ultimately selling any products. We may never succeed in any or all of these activities and, even if we do, we may never generate revenue that is sufficient to achieve profitability. Even if we do achieve profitability, we may not be able to sustain profitability or meet outside expectations for our profitability. If we are unable to achieve or sustain profitability or to meet outside expectations for our profitability, the price of our common stock could be materially adversely affected.

Because of the numerous risks and uncertainties associated with biopharmaceutical and biotechnology products and drug development, we are unable to accurately predict the timing or amount of increased expenses or when, or if, we will be able to achieve profitability. If we are required by the U.S. Food and Drug Administration (FDA) or comparable foreign regulatory authorities to perform studies in addition to those we currently anticipate, or if there are any delays in commencing or completing our clinical trials or the development of any of our product candidates, our expenses could increase and commercial revenue could be further delayed and become more uncertain, which will have a material adverse impact on our business.

Our substantial contingent consideration and related obligations from our acquisitions of assets and license and collaboration agreements may result in dilution to our stockholders, may be a drain on our cash resources, or may cause us to incur debt obligations to satisfy the payment obligations.

In connection with our acquisitions of assets in late 2020, we entered into arrangements whereby the former stockholders of those companies are entitled to substantial contingent consideration payments upon the occurrence of certain events. For example, in connection with our acquisition of BlackThorn Therapeutics, Inc. (BlackThorn), a privately held company, the former BlackThorn stockholders are entitled to contingent consideration (i) with respect to navacaprant (NMRA-140), in the form of development and regulatory approval milestones of up to an aggregate amount of $365.0 million, which includes a milestone payment that became due in October 2023 upon dosing the first patient in the Phase 3 clinical trial for navacaprant, which was primarily settled by issuing unregistered shares of our common stock in December 2023, and sales-based milestones of up to an aggregate amount of $450.0 million and (ii) with respect to NMRA-511, in the form of development and regulatory approval milestones of up to an aggregate amount of $100.0 million and sales-based milestones of up to an aggregate amount of $100.0 million (BlackThorn Milestone Payments). With the exception of one development milestone in the amount of $10.0 million that is required to be settled in cash, the remaining BlackThorn Milestone Payments may be settled in cash or shares of our equity, or a combination of both, at our sole discretion. In connection with the BlackThorn acquisition, we also became obligated under its license agreement with TSRI for, among other obligations, development and regulatory milestone payments of up to $1.5 million in aggregate for the first product from each of the TSRI programs and commercial milestone payments of up to $3.5 million in aggregate for each occurrence.

Under the terms of our September 2021 license agreements with Amgen, we are obligated to pay Amgen up to an aggregate of $720.0 million in commercial milestone payments upon the achievement of certain sales thresholds and single digit royalties on potential annual worldwide net sales related to the CK1δ or GCase programs. In addition, under the collaboration agreement with Amgen, we committed to making quarterly payments to Amgen for their collaboration activities over three years totaling $62.5 million.

Under the terms of our license agreement, as amended, with Vanderbilt University (Vanderbilt), we are obligated to pay Vanderbilt up to an aggregate of $422.4 million in development and commercial milestone payments upon the achievement of certain development milestones, which includes a milestone payment of $2.0 million that became due in October 2023, and sales thresholds, and mid-single digit royalties on potential future net sales.

In order to satisfy our obligations to make these payments, if and when they are triggered, we may need to issue equity or convertible debt securities that may cause dilution to our stockholders, or we may use our existing cash or incur debt obligations to satisfy the payment obligations in cash, which may adversely affect our financial position. In addition, these obligations may impede our ability to raise money in future public offerings of debt or equity securities or to obtain a third-party line of credit.

See the sections titled “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Acquisitions of Assets” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Strategic License and Research and Collaboration Agreements” in this Annual Report on Form 10-K for additional information regarding these agreements.

Our limited operating history may make it difficult to evaluate our prospects and likelihood of success.

We are a clinical-stage biopharmaceutical company with a limited operating history upon which you can evaluate our business and prospects. Since our inception in November 2019, we have devoted substantially all of our resources and efforts to building our organization, acquiring technologies and companies, executing preclinical studies and clinical trials, conducting research and development, identifying and developing potential product candidates, building our precision neuroscience tools, organizing and staffing our company, business planning, establishing, maintaining and protecting our intellectual property portfolio, raising capital and providing general and administrative support for these operations. All of our product candidates are in either clinical development or in preclinical stages of development, and we have not yet demonstrated our ability to successfully complete any late-stage or registrational/pivotal clinical trials, obtain regulatory approvals, manufacture a commercial scale product or arrange for a third party to do so on our behalf or conduct sales and marketing activities necessary for successful product commercialization. Additionally, we expect our financial condition and operating results to continue to fluctuate significantly from period to period due to a variety of factors, many of which are beyond our control. Consequently, any predictions you may make about our future success or viability may not be as accurate as they could be if we had a longer operating history.

In addition, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown factors and risks frequently experienced by clinical-stage biotechnology and biopharmaceutical companies in rapidly evolving fields. We also may need to transition from a company with a research focus to a company capable of supporting commercial activities. If we do not adequately address these risks and difficulties or successfully make such a transition, it could have a material adverse effect on our business.

We will require additional funding in order to finance operations. If we are unable to raise capital when needed, or on acceptable terms, we could be forced to delay, reduce or eliminate our product development programs or commercialization efforts.

Developing biopharmaceutical products, including conducting preclinical studies and clinical trials, is a very time-consuming, expensive and uncertain process that takes years to complete. We expect our expenses to continue to increase in connection with our ongoing activities, particularly as we conduct clinical trials of, and seek regulatory and marketing approval for, our product candidates. If one or more of our product candidates is approved for commercial sale, we anticipate incurring significant costs associated with commercializing any approved product candidate. To date, we have funded our operations principally through private financings. We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the clinical and preclinical development of our product candidates, continue to develop and deploy our precision neuroscience approach, commence additional preclinical studies and clinical trials, and continue to identify and develop additional product candidates either through internal development or through acquisitions or in-licensing product candidates.

In addition, if we obtain regulatory approval for any of our product candidates, we expect to incur significant commercialization expenses related to product manufacturing, marketing, sales and distribution. Accordingly, we will need to obtain substantial additional funding in order to support our continuing operations. If we are unable to raise capital when needed or on attractive terms, we could be forced to delay, reduce or eliminate our research and development programs or any future regulatory approval or commercialization efforts.

We expect to continue to expend significant resources for the foreseeable future. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. Attempting to secure additional financing may divert our management from our day-to-day activities, which may adversely affect our ability to develop our product candidates. Our future capital requirements will depend on many factors, including but not limited to:

- the scope, timing, progress, costs and results of discovery, preclinical development and clinical trials for our current or future product candidates;
- the number of clinical trials required for regulatory approval of our current or future product candidates;
- the costs, timing and outcome of regulatory review of any of our current or future product candidates;
- the costs associated with acquiring or licensing additional product candidates, technologies or assets, including the timing and amount of any milestones, royalties or other payments due in connection with our acquisitions and licenses;
- the cost of manufacturing clinical and commercial supplies of our current or future product candidates;
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims, including any claims by third parties that we are infringing upon their intellectual property rights;
- the effectiveness of our precision neuroscience approach at identifying target patient populations and utilizing our approach to enrich our patient population in our clinical trials;
- our ability to maintain existing, and establish new, strategic collaborations or other arrangements and the financial terms of any such agreements, including the timing and amount of any future milestone, royalty or other payments due under any such agreement;
- our ability to access additional multimodal patient datasets;
- the costs and timing of future commercialization activities, including manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval;
- expenses to attract, hire and retain skilled personnel;
- the costs of operating as a public company;
- our ability to establish a commercially viable pricing structure and obtain approval for coverage and adequate reimbursement from third-party and government payers;
- the effect of macroeconomic trends including inflation, tariffs, and interest rates;
- addressing any potential supply chain interruptions or delays;
- the effect of competing technological and market developments; and
- the extent to which we acquire or invest in business, products and technologies.

Our ability to raise additional funds will depend on financial, economic, political and market conditions and other factors, over which we may have no or limited control. Additional funds may not be available when we need them, on terms that are acceptable to us, or at all. If we fail to obtain necessary capital when needed on acceptable terms, or at all, it could force us to delay, limit, reduce or terminate our product development programs, future commercialization efforts or other operations. Because of the numerous risks and uncertainties associated with research, product development and commercialization of product candidates, we are unable to predict the timing or amount of our working capital requirements or when or if we will be able to achieve or maintain profitability.

Accordingly, we will need to continue to rely on additional financing to achieve our business objectives and adequate additional financing may not be available to us on acceptable terms, or at all.

Raising additional capital may cause dilution to our stockholders, restrict our operations or require us to relinquish rights to our technologies or product candidates.

Until such time, if ever, as we can generate substantial product revenue, we expect to finance our operations with our existing cash, cash equivalents and marketable securities, the net proceeds from our initial public offering, any future equity or debt financings and upfront and milestone and royalties payments, if any, received under any future licenses or collaborations. If we raise additional capital through the sale of equity or convertible debt securities, or issue any equity or convertible debt securities in connection with a collaboration agreement or other contractual arrangement, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a holder of our common stock. In addition, the possibility of such issuance may cause the market price of our common stock to decline. For example, in October 2024 we entered into a sales agreement with Leerink Partners LLC (Leerink) to sell shares of our common stock, from time to time, with aggregate gross sales proceeds of up to $300.0 million, through an at-the-market equity offering program (ATM) with Leerink as the sales agent. During the year ended December 31, 2024, we received aggregate net proceeds of $13.7 million through sales of shares of our common stock under the ATM after deducting commissions and offering expenses of $0.8 million. In December 2023, we settled a Phase 3 navacaprant milestone owed to Blackthorn stockholders by primarily issuing shares of our common stock. Debt financing, if available, may result in increased fixed payment obligations and involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, declaring dividends or acquiring, selling or licensing intellectual property rights or assets, which could adversely impact our ability to conduct our business.

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 intellectual property, technologies, future revenue streams or product candidates or grant licenses on terms that may not be favorable to us. We could also be required to seek funds through arrangements with collaborators or others at an earlier stage than otherwise would be desirable. Any of these occurrences may have a material adverse effect on our business, operating results and prospects.

We maintain the majority of our cash and cash equivalents in accounts with major U.S. and multi-national financial institutions, and our deposits at certain of these institutions exceed insured limits. Market conditions and changes in financial regulations and policies can impact the viability of these institutions. In the event of failure of any of the financial institutions where we maintain our cash and cash equivalents, there can be no assurance that we would be able to access uninsured funds in a timely manner or at all. Any inability to access or delay in accessing these funds could adversely affect our business and financial position. In addition, changes in regulations governing financial institutions are beyond our control and difficult to predict; consequently, the impact of such changes on our business and results of operations is difficult to predict and may have an adverse effect on us.

Risks Related to Our Business

If we are unable to successfully identify, develop and commercialize any product candidates, or experience significant delays in doing so, our business, financial condition and results of operations will be materially adversely affected.

Our ability to generate revenue from sales of any of our approved product candidates, which we do not expect will occur for at least the next several years, depends heavily on the successful identification, development, regulatory approval and eventual commercialization of any product candidates, which may never occur. We have never generated revenue from sales of any products, and we may never be able to develop, obtain regulatory approval for, or commercialize, a marketable product. All of our product candidates will require significant clinical development, regulatory approval, establishment of sufficient manufacturing supply, including commercial manufacturing supply, and may require us to build a commercial organization and make substantial investment and significant marketing efforts before we generate any revenue from product sales. We are not permitted to market or promote any of our product candidates before we receive regulatory approval from the FDA or comparable foreign regulatory authorities, and we may never receive such regulatory approval for any of our product candidates.

The successful development of our product candidates will depend on several factors, including, but not limited to, the following:

- successful and timely completion of preclinical studies and clinical trials for which the FDA, or any comparable foreign regulatory authority, align with the design, endpoints, or implementation;
- sufficiency of our financial and other resources to complete the necessary preclinical studies and clinical trials;
- receiving regulatory approvals, allowances or authorizations for conducting future clinical trials;
- initiation and successful patient enrollment in, and completion of, clinical trials on a timely basis;
- our ability to demonstrate to the satisfaction of the FDA or any comparable foreign regulatory authority that the applicable product candidate is safe and effective as for its intended uses;
- our ability to demonstrate to the satisfaction of the FDA or any comparable foreign regulatory authority that the applicable product candidate's risk-benefit ratio for its proposed indication is acceptable;
- timely receipt of marketing approvals for our product candidates from applicable regulatory authorities;
- addressing any potential supply chain interruptions or delays;
- the extent of any required post-marketing approval commitments to applicable regulatory authorities; and
- establishing, scaling up and scaling out, either alone or with third-party manufacturers, manufacturing capabilities of clinical supply for our clinical trials and commercial manufacturing, if any of our product candidates are approved.

If we do not achieve one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully develop and commercialize our product candidates, which would materially adversely affect our business, financial condition, and results of operations.

Additionally, clinical or regulatory setbacks to other companies developing similar products or within adjacent fields may impact the clinical development of and regulatory pathway for our current or future product candidates, or may negatively impact the perceptions of value or risk of our technologies.

We were founded with a mission to redefine neuroscience drug development, a field that has seen very limited success. The ability to successfully develop drugs in this field is extremely difficult and is subject to a number of unique challenges.

Drug development in the field of brain diseases, and neuropsychiatric disorders and neurodegenerative diseases in particular, has seen very limited success historically. We estimate over $110 billion has been spent on neuroscience research and development since 2019 in the United States alone, representing approximately 33% of all disease-specific spending. However, only approximately 12% of all new therapies approved during this time period have been for the treatment of brain diseases. From 2011 to 2020, clinical development success rates for new drug candidates that employed patient selection biomarkers were approximately 16% compared to approximately 8% for patients without patient selection biomarkers according to the BIO; however, clinical success depends on a number of factors and employing a patient selection biomarker approach does not guarantee that our product candidates will be approved and commercialized. Developing a product candidate for treatment of these brain diseases is extremely difficult and subjects us to a number of unique challenges, including obtaining regulatory approval from the FDA and other regulatory authorities who have only a limited set of precedents to rely on.

We intend to work closely with the FDA and comparable foreign regulatory authorities to perform the requisite scientific analyses and evaluation in an effort to obtain regulatory approval for our product candidates; however, the process of developing our product candidates may be more complex and time-consuming relative to other more well-known approaches to drug development. We cannot be certain that our approach will lead to the development of product candidates that effectively and safely address the underlying brain diseases.

Moreover, given the history of clinical failures in this field, future clinical or regulatory failures by us or others may result in further negative perception of the likelihood of success in this field, which may significantly and adversely affect the market price of our common stock.

We have invested and expect to continue to invest in acquiring product candidates, technologies and assets, as well as research and development efforts that further enhance our product pipeline. Such investments may affect our operating results, and, if the return on these investments is lower or develops more slowly than we expect, our revenue and operating results may suffer.

We have invested and expect to continue to invest in acquiring potential product candidates to enhance our product pipeline, technologies and assets. These activities and investments involve significant time, risks, and uncertainties, including the risk that the associated expenses may affect our operating results, such investments may not generate products that can be successfully developed or technologies that can be effectively used by us, and may cause significant drains on capital resources and commit us to substantial financial obligations. While we believe that we must continue to invest a significant amount of time and resources in the development of our product pipeline, if we do not achieve the benefits anticipated from these investments, or if the achievement of these benefits is delayed, our business, operating results and prospects may be materially adversely affected.

We have experienced rapid growth since our inception in November 2019. If we fail to effectively manage our growth, we may not be able to execute on our business objectives.

As of December 31, 2024, we had 110 full-time employees. We will continue to implement and improve our managerial, operational, and financial systems, expand our facilities, and continue to recruit and train additional qualified personnel. Due to the complexity in managing a company that has scaled very quickly, we may not be able to scale our headcount and operations effectively to manage the expansion of our product pipeline or recruit and train the necessary additional personnel. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

In addition, any future growth would impose significant added responsibilities on members of management, including: identifying, recruiting, integrating, maintaining, and motivating additional employees; managing our internal development efforts effectively, including the clinical and FDA review process for our product candidates, while complying with our contractual obligations to contractors and other third parties; and improving and scaling our operational, financial and management controls, reporting systems and procedures.

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

Our ability to develop product candidates, leverage our precision neuroscience approach and our future growth depends on attracting, hiring and retaining our key personnel and recruiting additional qualified personnel.

Our success depends upon the continued contributions of our key management and scientific personnel, many of whom have been instrumental for us and have substantial experience with developing therapies, identifying potential product candidates and building the technologies related to the clinical development of our product candidates. Given the specialized nature of brain diseases and our approach, there is an inherent scarcity of experienced personnel in these fields. As we continue developing our product candidates in our pipeline, we will require personnel with medical, scientific, or technical qualifications specific to each program. The loss of key personnel, in particular our neuroscientists, would delay our research and development activities. Despite our efforts to retain valuable employees, members of our team may terminate their employment with us on short notice. The competition for qualified personnel in the biotechnology and biopharmaceutical industries is intense, and our future success depends upon our ability to attract, retain, and motivate highly skilled scientific, technical and managerial employees. We face competition for personnel from other companies, universities, public and private research institutions, and other organizations. If our recruitment and retention efforts are unsuccessful in the future, it may be difficult for us to implement our business strategy, which would have a material adverse effect on our business.

In addition, our clinical operations and research and development programs depend on our ability to attract and retain highly skilled scientists, data scientists, and engineers, particularly in Massachusetts and California.

There is powerful competition for skilled personnel in these geographical markets, and we have from time to time experienced, and we expect to continue to experience, difficulty in hiring and retaining employees with appropriate qualifications on acceptable terms, or at all. Many of the companies with which we compete for experienced personnel have greater resources than we do, and any of our employees may terminate their employment with us at any time. If we hire employees from competitors or other companies, their former employers may attempt to assert that these employees or we have breached legal obligations, resulting in a diversion of our time and resources and, potentially, damages. In addition, job candidates and existing employees often consider the value of the stock awards they receive in connection with their employment. If the perceived benefits of our stock awards decline, it may harm our ability to recruit and retain highly skilled employees. If we fail to attract new personnel or fail to retain and motivate our current personnel, our business and future growth prospects would be harmed.

We may not realize the benefits of assets that we have acquired, or will acquire in the future, or other strategic transactions that we have consummated or will consummate.

Our approach represents an aggregation of innovation and assets from multiple companies and academic institutions, including BlackThorn, Amgen, TSRI and Vanderbilt. Further, a key component of our strategy is to acquire and in-license assets and technologies to support the growth of our product pipeline and to enhance our Precision Toolbox. As such, we actively evaluate various strategic transactions on an ongoing basis. We may acquire other assets, businesses, products or technologies, as well as pursue joint ventures or investments in complementary businesses. The success of our strategic transactions and any future strategic transactions depends on the risks and uncertainties involved including:

- unanticipated liabilities related to acquired companies or joint ventures;
- difficulties integrating acquired personnel, technologies, and operations into our existing business;
- retention of key employees;
- diversion of management time and focus from operating our business to the management of acquisition and integration efforts, strategic alliances or joint ventures challenges;
- increases in our expenses and reductions in our cash available for operations and other uses;
- disruption in our relationships with collaborators or suppliers; and
- possible write-offs or impairment charges relating to acquired businesses or joint ventures.

If any of these risks or uncertainties occur, we may not realize the anticipated benefit of any acquisition or strategic transaction. For example, less than one year following the acquisition of Propellex, we terminated and are no longer developing the program we acquired from Propellex. Additionally, foreign acquisitions and joint ventures are subject to additional risks, including those related to integration of operations across different cultures and languages, currency risks, potentially adverse tax consequences of overseas operations and the particular economic, political and regulatory risks associated with specific countries.

Future acquisitions or dispositions could result in potentially dilutive issuances of our equity securities, the incurrence of debt, contingent liabilities or amortization expenses, impairments or write-offs of goodwill or impairments and write-offs of in-process research and development assets, any of which could harm our financial condition.

We have relied on, and in the future will continue to rely on, third-party datasets and databases to build and enhance our precision neuroscience approach. If we are not able to access additional data sets or develop enhancements to our precision neuroscience approach, our ability to execute on our strategy may be limited.

Our ability to execute on our drug development strategy depends in part on our ability to enhance and improve our precision neuroscience approach. As part of this approach, we interrogate public, partnered and proprietary datasets across neuropsychiatric and neurodegenerative diseases, currently encompassing genetic, imaging, electroencephalogram (EEG), digital and clinical data. We rely on these datasets and data analytics for identifying or validating some of our biomarker-target relationships. The success of our precision neuroscience approach and any enhancement to our approach depends on several factors, including access to and generation of additional multimodal patient datasets, whether public, partnered or proprietary, development of more advanced proprietary machine learning capabilities and increased computational storage and processing capacity. If we are unable to access additional datasets or they are not available on acceptable terms, or if we are otherwise unsuccessful in enhancing our approach, we may be limited in our precision neuroscience capabilities and not be able to fully utilize a precision neuroscience drug development strategy.

In addition, access to public data sets may be limited by governmental or other restrictions, including restrictions on commercial application by government or government sponsored organizations or privacy related restrictions. See the risk factor "We face potential liability related to the privacy of health information we utilize in the development of product candidates, as well as information we obtain from clinical trials sponsored by us from research institutions and directly from individuals" for additional information on privacy related considerations.

We operate in highly competitive and rapidly changing industries, which may result in others discovering, developing or commercializing competing products before or more successfully than we do.

The biotechnology and biopharmaceutical industries are highly competitive and subject to significant and rapid technological change. Our success is highly dependent on our ability to discover, develop and obtain marketing approval for new and innovative products on a cost-effective basis and to market them successfully. In doing so, we face and will continue to face intense competition from a variety of businesses, including large biopharmaceutical and biotechnology companies, academic institutions, government agencies and other public and private research organizations. These organizations may have significantly greater resources than we do and conduct similar research, seek patent protection and establish collaborative arrangements for research, development, manufacturing, and marketing of products that compete with our product candidates. Mergers and acquisitions in the biotechnology and biopharmaceutical industries may result in even more resources being concentrated in our competitors. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries.

With the proliferation of new drugs and therapies for our target indications, we expect to face increasingly intense competition as new technologies become available. If we fail to stay at the forefront of technological change, we may be unable to compete effectively. Any product candidates that we successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future. The highly competitive nature of and rapid technological changes in the biotechnology and biopharmaceutical industries could render our product candidates or our technology obsolete, less competitive or uneconomical. Our competitors may, among other things:

- have significantly greater financial, manufacturing, marketing, drug development, technical, and human resources than we do;
- develop and commercialize products that are safer, more effective, less expensive, more convenient or easier to administer, or have fewer or less severe side effects;
- obtain quicker regulatory approval;
- establish superior proprietary positions covering our products and technologies;
- implement more effective approaches to sales and marketing; or
- form more advantageous strategic alliances.

Should any of these factors occur, our business, financial condition and results of operations could be materially adversely affected.

In addition, any collaborators may decide to market and sell products that compete with the product candidates that we have agreed to license to them, and any competition by our collaborators could also have a material adverse effect on our future business, financial condition, and results of operations.

Smaller and other early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in developing or acquiring technologies complementary to, or necessary for, our programs.

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

Because we have limited financial and managerial resources, we focus on research programs, therapeutic platforms, and product candidates that we identify for specific indications. Additionally, we have contractual commitments under the agreements for various product candidate assets that we acquired from third parties, as well as our license and collaboration agreements, to use commercially reasonable efforts to develop certain programs and, thus, do not have unilateral discretion to vary from such agreed to efforts. In addition, we have contractual commitments to conduct certain development plans, and thus may not have discretion to modify such development plans, including clinical trial designs, without agreement from our collaboration partner. As a result, we may forego or delay pursuit of opportunities with other therapeutic platforms or product candidates or for other indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs, therapeutic platforms, and product candidates for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing, or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights.

We rely upon third-party providers of cloud-based infrastructure to host our platforms. Any disruption in the operations of these third-party providers, limitations on capacity, or interference with our use could adversely affect our business, financial condition, and results of operations.

We outsource substantially all of the technological infrastructure relating to our hosted platform to third-party hosting services, such as Amazon Web Services. We have no control over any of these third parties, and while we attempt to reduce risk by minimizing reliance on any single third party or its operations, we cannot guarantee that such third-party providers will not experience system interruptions, outages or delays, or deterioration in their performance. We need to be able to access our computational platform at any time, without interruption or degradation of performance. Our hosted platform depends on protecting the virtual cloud infrastructure hosted by third-party hosting services by maintaining its configuration, architecture, features, and interconnection specifications, as well as protecting the information stored in these virtual data centers, which is transmitted by third-party Internet service providers. We have experienced and expect that in the future we may again experience interruptions, delays and outages in service and availability from time to time due to a variety of factors, including infrastructure changes, human or software errors, website hosting disruptions and capacity constraints. Any limitation on the capacity of our third-party hosting services could adversely affect our business, financial condition, and results of operations. In addition, any incident affecting our third-party hosting services' infrastructure that may be caused by cyber-attacks, natural disasters, fire, flood, severe storm, earthquake, power loss, telecommunications failures, terrorist or other attacks, and other disruptive events beyond our control could negatively affect our cloud-based solutions. A prolonged service disruption affecting our cloud-based solutions could damage our reputation or otherwise harm our business. We may also incur significant costs for using alternative equipment or taking other actions in preparation for, or in reaction to, events that damage the third-party hosting services we use.

In the event that our service agreements with our third-party hosting services are terminated, or there is a lapse of service, elimination of services or features that we utilize, interruption of internet service provider connectivity, or damage to such facilities, we could experience interruptions in access to our platform as well as significant delays and additional expense in arranging or creating new facilities and services and/or re-architecting our hosted software solutions for deployment on a different cloud infrastructure service provider, which could adversely affect our business, financial condition, and results of operations.

If our security measures are breached or unauthorized access to our other data is otherwise obtained, our data may be perceived as not being secure and we may incur significant liabilities.

We use a set of proprietary tools to generate, analyze, and derive novel insights from our data. As a result, unauthorized access to or security breaches of our data, as a result of third-party action, employee or contractor error, malfeasance, or otherwise could require us to make filings with the SEC and provide notification to individuals, governmental authorities, supervisory bodies, the media and other parties pursuant to privacy and security laws and result in the loss or corruption of, or other damage to information, claims and litigation, indemnity obligations, damage to our reputation, and other liability. Our collaborators and other third parties we work with may also suffer similar security breaches of data that we rely on. Because the techniques used to obtain unauthorized access or sabotage systems change frequently and generally are not identified until they are launched against a target, we and those we collaborate with may be unable to anticipate these techniques or implement adequate preventative measures. Even if identified, we may be unable to adequately investigate or remediate incidents or breaches due to attackers increasingly using tools and techniques that are designed to circumvent controls, to avoid detection, and to remove or obfuscate forensic evidence. In addition, if our employees or contractors fail to adhere to practices we have established to maintain a firewall between our internal drug discovery team and our teams that work with external individuals, including our collaborators, or if the technical solutions we have adopted to maintain the firewall malfunction, our collaborators may lose confidence in our ability to maintain the confidentiality of their intellectual property, we may have trouble attracting new collaborators, we may be subject to breach of contract claims by our collaborators, and we may suffer reputational and other harm as a result. Federal, state and foreign laws and regulations may also expose us to enforcement actions and investigations by regulatory authorities, and potentially result in legal claims or proceedings (such as class actions), regulatory investigations and enforcement actions, fines and penalties, negative reputational impacts that cause us to lose existing or future customers, and/or significant incident response, system restoration or remediation and future compliance costs. Any or all of these issues could result in reputational damage or subject us to third-party lawsuits or other action or liability, which could adversely affect our operating results and the further development and commercialization of our products. Our insurance may not be adequate to cover losses associated with such events, and in any case, such insurance may not cover all of the types of costs, expenses, and losses we could incur to respond to and remediate a security breach.

Our precision neuroscience tools utilize third-party open source software, and any failure to comply with the terms of one or more of these open source software licenses could adversely affect our business, subject us to litigation, or create potential liability.

Our precision neuroscience tools include software licensed by third parties under any one or more open source licenses, and we expect to continue to incorporate open source software in our precision neuroscience tools in the future. While we have a process in place for monitoring the use of open source software by our employees, we cannot ensure we are aware of every instance of such use or have validated the quality or source of such software, or that we are in compliance with the terms of the applicable open source licenses or our current policies and procedures. There have been claims against companies that use open source software in their products and services asserting that the use of such open source software infringes the claimants' intellectual property rights. As a result, we could be subject to suits by third parties claiming that what we believe to be licensed open source software infringes such third parties' intellectual property rights. Additionally, if an author or other third party that distributes such open source software were to allege that we had not complied with the conditions of one or more of these licenses, we could be required to incur significant legal expenses defending against such allegations and could be subject to significant damages and required to comply with onerous conditions or restrictions on these solutions, which could disrupt the distribution and sale of these solutions. Litigation could be costly for us to defend, have a negative effect on our business, financial condition, and results of operations, or require us to devote additional research and development resources to change our precision neuroscience tools. Furthermore, these third-party open source providers could experience service outages, data loss, privacy breaches, cyber-attacks, and other events relating to the applications and services they provide that could diminish the utility of these services and which could harm our business as a result.

Use of open source software may entail greater risks than use of third-party commercial software, as open source licensors generally do not provide warranties or other contractual protections regarding infringement claims or the quality of the code, including with respect to security vulnerabilities where open source software may be more susceptible. In addition, certain open source licenses require that source code for software programs that interact with such open source software be made available to the public at no cost and that any modifications or derivative works to such open source software continue to be licensed under the same terms as the open source software license. The terms of various open source licenses to which we are subject have not been interpreted by courts in the relevant jurisdictions, and there is a risk that such licenses could be construed in a manner that imposes unanticipated conditions or restrictions on our ability to market or provide our software and data. By the terms of certain open source licenses, we could be required to release the source code of our proprietary software, and to make our proprietary software available under open source licenses, if we combine our proprietary software with open source software in a certain manner. In the event that portions of our proprietary software are determined to be subject to an open source license, we could be required to publicly release the affected portions of our source code, re-engineer all or a portion of our precision neuroscience tools, or otherwise be limited in the licensing of our precision neuroscience tools, each of which could reduce or eliminate the value of our precision neuroscience tools. Disclosing our proprietary source code could allow our competitors to create similar products with lower development effort and time and ultimately could result in a loss of sales. Furthermore, any such re-engineering or other remedial efforts could require significant additional research and development resources, and we may not be able to successfully complete any such re-engineering or other remedial efforts. Any of these events could create liability for us and damage our reputation, which could have a material adverse effect on our revenue, business, results of operations, and financial condition and the market price of our shares.

Risks Related to the Development and Clinical Testing of Our Product Candidates

Clinical and preclinical drug development is a lengthy and expensive process, with an uncertain outcome. Our clinical and preclinical programs have experienced delays and may experience additional delays or may never advance, which would adversely affect our ability to obtain regulatory approvals or commercialize our product candidates on a timely basis or at all, which could have an adverse effect on our business.

In order to obtain FDA approval to market our product candidates, we must demonstrate the safety and efficacy of our product candidates in humans to the satisfaction of the FDA. To meet these requirements, we will have to conduct adequate and well-controlled clinical trials. Clinical testing is expensive, time-consuming and subject to uncertainty. Conducting preclinical testing and clinical trials represents a lengthy, time-consuming and expensive process. The length of time may vary substantially according to the type, complexity and novelty of the program, and often can be several years or more per program. Delays associated with programs for which we are directly conducting preclinical studies may cause us to incur additional operating expenses. The commencement and rate of completion of preclinical studies and clinical trials for a product candidate may be delayed by many factors, including, but not limited to:

- inability to generate sufficient preclinical or other *in vivo* or *in vitro* data to support the initiation of clinical studies;
- timely completion of preclinical laboratory tests, animal studies and formulation studies in accordance with FDA's Good Laboratory Practice (GLP) requirements and other applicable regulations;
- approval by an independent Institutional Review Board (IRB) or ethics committee at each clinical site before each trial may be initiated;
- delays in reaching a consensus with regulatory agencies on study design and obtaining regulatory authorization to commence clinical trials; delays in reaching agreement on acceptable terms with prospective contract research organizations (CROs), and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and clinical trial sites;
- delays in identifying, recruiting and training suitable clinical investigators;
- delays in recruiting suitable patients to participate in our clinical trials;
- delays in manufacturing, testing, releasing, validating or importing/exporting sufficient stable quantities of our product candidates for use in clinical trials or the inability to do any of the foregoing;
- insufficient or inadequate supply or quality of product candidates or other materials necessary for use in clinical trials, or delays in sufficiently developing, characterizing or controlling a manufacturing process suitable for clinical trials;
- imposition of a temporary or permanent clinical hold by regulatory authorities;
- developments on trials conducted by competitors for related technology that raises FDA or foreign regulatory authority concerns about risk to patients of the technology broadly, or if the FDA or a foreign regulatory authority finds that the investigational protocol or plan is clearly deficient to meet its stated objectives;

- delays in recruiting, screening and enrolling patients and delays caused by patients withdrawing from clinical trials or failing to return for post-treatment follow-up;
- difficulty collaborating with patient groups and investigators;
- failure by our CROs, other third parties or us to adhere to clinical trial protocols; failure to perform in accordance with the FDA's or any other regulatory authority's good clinical practice (GCP) requirements, or applicable regulatory guidelines in other countries;
- occurrence of adverse events associated with the product candidate that are viewed to outweigh its potential benefits, or occurrence of adverse events in trial of the same class of agents conducted by other companies;
- changes to the clinical trial protocols;
- clinical sites deviating from trial protocol or dropping out of a trial;
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols;
- changes in the standard of care on which a clinical development plan was based, which may require new or additional trials;
- selection of clinical endpoints that require prolonged periods of observation or analyses of resulting data;
- the cost of clinical trials of our product candidates being greater than we anticipate;
- clinical trials of our product candidates producing negative or inconclusive results, which may result in our deciding, or regulators requiring us, to conduct additional clinical trials or abandon development of such product candidates;
- transfer of manufacturing processes to larger-scale facilities operated by a contract manufacturing organization (CMO) and delays or failure by our CMOs or us to make any necessary changes to such manufacturing process; and
- third parties being unwilling or unable to satisfy their contractual obligations to us.

Clinical trials must be conducted in accordance with the FDA's and other applicable regulatory authorities' legal requirements, regulations or guidelines, and are subject to oversight by these governmental agencies and ethics committees or IRBs at the medical institutions where the clinical trials are conducted. We could also encounter delays if a clinical trial is suspended or terminated by us, by the IRBs of the institutions in which such trials are being conducted, by a Data Safety Monitoring Board for such trial or by the FDA or comparable foreign regulatory authorities. Such authorities may impose such a suspension or termination due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or comparable foreign regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a drug, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial. For example, in April 2024, our Phase 1 trial of NMRA-266 was placed on clinical hold by the FDA after data from nonclinical studies showed convulsions in rabbits. Although we are in discussions with the FDA regarding the potential to remove the clinical hold, there is no guarantee that we will be able to successfully resolve the clinical hold issues or resume clinical studies of NMRA-266 in the time and manner that we expect. In addition, changes in regulatory requirements and policies may occur, and we may need to amend clinical trial protocols to comply with these changes. Amendments may require us to resubmit our clinical trial protocols to IRBs for reexamination, which may impact the costs, timing or successful completion of a clinical trial.

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

Moreover, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and receive compensation in connection with such services. Under certain circumstances, we may be required to report some of these relationships to the FDA or comparable foreign regulatory authorities. The FDA or comparable foreign regulatory authority may conclude that a financial relationship between us and a principal investigator has created a conflict of interest or otherwise affected interpretation of the study. The FDA or comparable foreign regulatory authority may therefore question the integrity of the data generated at the applicable clinical trial site and the utility of the clinical trial itself may be jeopardized. This could result in a delay in approval, or rejection, of our marketing applications by the FDA or comparable foreign regulatory authority, as the case may be, and may ultimately lead to the denial of marketing approval of one or more of our product candidates.

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

In addition, the FDA's and other regulatory authorities' policies with respect to clinical trials may change and additional government regulations may be enacted. For example the EU Clinical Trials Regulation (CTR) which was adopted in April 2014 and repeals the EU Clinical Trials Directive, became applicable on January 31, 2022. While the Clinical Trials Directive required a separate clinical trial application (CTA), to be submitted in each member state in which the clinical trial takes place, to both the competent national health authority and an independent ethics committee, the CTR introduces a centralized process and only requires the submission of a single application for multi-center trials. The CTR allows sponsors to make a single submission to both the competent authority and an ethics committee in each member state, leading to a single decision per member state. The assessment procedure of the CTA has been harmonized as well, including a joint assessment by all member states concerned, and a separate assessment by each member state with respect to specific requirements related to its own territory, including ethics rules. Each member state's decision is communicated to the sponsor via the centralized EU portal. Once the CTA is approved, clinical study development may proceed. The CTR transition period ended on January 31, 2025, and all clinical trials (and related applications) are now fully subject to the provisions of the CTR. Compliance with the CTR requirements by us and our third-party service providers, such as Contract research organizations (CRO), may impact our developments plans.

It is currently unclear to what extent the UK will seek to align its regulations with the EU. The UK regulatory framework in relation to clinical trials is derived from existing EU legislation (as implemented into UK law, through secondary legislation).

On January 17, 2022, the UK Medicines and Healthcare products Regulatory Agency (MHRA), launched an eight-week consultation on reframing the UK legislation for clinical trials which aimed to streamline clinical trials approvals, enable innovation, enhance clinical trials transparency, enable greater risk proportionality, and promote patient and public involvement in clinical trials. The MHRA published its consultation outcome on March 21, 2023 confirming that it would bring forward changes to the legislation. These resulting legislative amendments, which are yet to be published, will ultimately determine the extent to which the UK regulations align with the (EU) CTR. A decision by the UK not to closely align its regulations with the new approach adopted in the EU may have an effect on the cost of conducting clinical trials in the UK as opposed to other countries.

If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies governing clinical trials, our development plans may be impacted.

Results of preclinical studies or clinical trials of any product candidates may not be predictive of the results of future preclinical studies or clinical trials.

To obtain the requisite regulatory approvals to market and sell any of our product candidates, we or any collaborator for such product candidate must demonstrate through extensive preclinical studies and clinical trials that the product candidate is safe and effective in humans. Before an IND can be submitted to the FDA and become effective, which is a prerequisite for conducting clinical trials on human subjects in the United States, a product candidate must successfully progress through extensive preclinical studies, which include preclinical laboratory testing, animal studies, and formulation studies, certain of which must be conducted in accordance with GLP. We cannot be certain of the timely completion or outcome of any preclinical studies. We also cannot predict if the FDA or comparable regulatory authorities will allow our proposed clinical programs to proceed or if the outcome of our preclinical studies will ultimately support further development of our programs. Additionally, we cannot be sure that we will be able to submit INDs or similar applications with respect to our product candidates on the timelines we expect, if at all, and we cannot be sure that submission of IND or similar applications will result in the FDA or other regulatory authorities allowing clinical trials to begin.

Moreover, success in preclinical studies or early clinical trials does not ensure that later preclinical studies or clinical trials will be successful. A number of companies in the biotechnology and biopharmaceutical industries have suffered significant setbacks in clinical trials, even after positive results in earlier preclinical studies. These setbacks have been caused by, among other things, preclinical findings made while clinical trials were underway and safety or efficacy observations made in clinical trials, including previously unreported adverse events. The design of a clinical trial can determine whether its results will support approval of a product, and flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced. In addition, clinical and preclinical data are often susceptible to varying interpretations and analyses. Notwithstanding any potential promising results in earlier studies, we cannot be certain that we will not face similar setbacks. For example, in January 2025, we announced that our KOASTAL-1 study did not demonstrate a statistically significant improvement on the primary endpoint of change from baseline in the Montgomery-Åsberg Depression Rating Scale (MADRS) total score at Week 6 or the key secondary endpoint of a change from baseline in the Snaith-Hamilton Pleasure Scale (SHAPS) scale. In addition, the results of our preclinical animal studies, including our non-human primate studies, may not be predictive of the results of outcomes in subsequent clinical trials on human subjects. Product candidates in clinical trials may fail to show the desired pharmacological properties or safety and efficacy traits despite having progressed through preclinical studies.

If we fail to receive positive results in preclinical studies or clinical trials of any product candidate, the development timeline and regulatory approval and commercialization prospects for that product candidate, and, correspondingly, our business and financial prospects, would be negatively impacted.

Our product candidates may have serious adverse, undesirable, or unacceptable side effects or other properties that may delay or prevent marketing approval. If such side effects are identified following approval, if any, the commercial profile of any approved label may be limited, or we may be subject to other significant negative consequences following marketing approval, if any.

Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects or unexpected characteristics. Undesirable side effects that may be caused by our product candidates could cause us or regulatory authorities to interrupt, delay, or halt clinical trials and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or comparable foreign authorities. The drug-related side effects could affect patient recruitment or the ability of enrolled patients to complete the trial or result in potential product liability claims. Any of these occurrences may harm our business, financial condition and prospects significantly.

Moreover, if our product candidates are associated with undesirable side effects in clinical trials or have characteristics that are unexpected, we may elect to abandon their development or limit their development to more narrow uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective, which may limit the commercial expectations for the product candidate if approved. We may also be required to modify our study plans based on findings in our ongoing preclinical studies or clinical trials. For example, in a rat study, at its highest dose (100 mg/kg/day) navacaprant was observed to have skin-related phototoxicity of erythema, edema and flaking additionally ocular phototoxicity (corneal edema). While no phototoxicity has been observed in our Phase 1 clinical trials, we monitored visual acuity and corneal integrity in our Phase 2 clinical trial to confirm there was no phototoxicity in humans. Though we did not observe any phototoxicity effects in our Phase 2 clinical trial, if phototoxicity is experienced in our later-stage clinical trials, the labeling implications of such safety warnings may limit any future product sales, if navacaprant is approved.

Further, clinical trials by their nature utilize a sample of the potential patient population. With a limited number of patients and limited duration of exposure, rare and severe side effects of our product candidates may only be uncovered with a significantly larger number of patients exposed to the product candidate. It is possible that as we test our product candidates in larger, longer and more extensive clinical trials, including with different dosing regimens, or as the use of these product candidates becomes more widespread if they receive regulatory approval, illnesses, injuries, discomforts and other adverse events that were observed in earlier trials, as well as conditions that did not occur or went undetected in previous trials, may be reported by subjects. If such side effects become known later in development or upon approval, if any, such findings may harm our business, financial condition and prospects significantly.

In the event that any of our product candidates receives marketing approval and we or others later identify undesirable or unacceptable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw or limit approvals of such products and require us to take our approved product off the market;
- regulatory authorities may require the addition of labeling statements, specific warnings, a contraindication or field alerts to physicians and pharmacies, or issue other communications containing warnings or other safety information about the product;
- regulatory authorities may require a medication guide outlining the risks of such side effects for distribution to patients, or that we implement a risk evaluation and mitigation strategy (REMS), plan to ensure that the benefits of the product outweigh its risks;
- we may be required to change the dose or the way the product is administered, conduct additional clinical trials, or change the labeling of the product;
- we may be subject to limitations on how we may promote or manufacture the product;
- sales of the product may decrease significantly;
- we may be subject to litigation or product liability claims; and
- our reputation may suffer.

Any of these events could prevent us or our potential future partners 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 revenue from the sale of any products.

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

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

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

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

We depend on enrollment and retention of patients in our clinical trials for our product candidates. If we experience delays or difficulties enrolling or retaining patients in our clinical trials, our research and development efforts and business, financial condition and results of operations could be materially adversely affected.

Successful and timely completion of clinical trials requires that we enroll and retain a sufficient number of patient candidates. Any clinical trials we conduct may be subject to delays for a variety of reasons, including as a result of patient enrollment taking longer than anticipated, patient withdrawal or adverse events. These types of developments could cause us to delay the trial or halt further development.

Our clinical trials will compete with other clinical trials that are in the same therapeutic areas as our product candidates, and this competition reduces the number and types of patients available to us, as some patients who might have opted to enroll in our trials may instead opt to enroll in a trial being conducted by one of our competitors.

Because the number of qualified clinical investigators and clinical trial sites is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials at such clinical trial sites. The eligibility criteria of our clinical studies, and in particular, any eligibility criteria we may establish using our precision neuroscience approach, may limit the pool of available study participants as we will require that patients have specific characteristics that we can measure or to assure their disease is either severe enough or not too advanced to include them in a study.

Patient enrollment depends on many factors, including:

- the size and nature of the patient population;
- the severity of the disease under investigation;
- eligibility criteria for the trial;
- the proximity of patients to clinical sites;
- the design of the clinical protocol;
- the ability to obtain and maintain patient consents;
- the ability to recruit clinical trial investigators with the appropriate competencies and experience;
- the risk that patients enrolled in clinical trials will drop out of the trials before the administration of our product candidates or trial completion;
- the availability of competing clinical trials;
- the availability of new drugs approved for the indication the clinical trial is investigating; and
- clinicians' and patients' perceptions as to the potential advantages of the drug being studied in relation to other available therapies.

These factors may make it difficult for us to enroll enough patients to complete our clinical trials in a timely and cost-effective manner. Delays in the completion of any clinical trial of our product candidates will increase our costs, slow down our product candidate development and approval process, and delay or potentially jeopardize our ability to commence product sales and generate revenue. In addition, some of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates.

The estimates of market opportunity and forecasts of market growth included in our public disclosures may prove to be smaller than we believe, and even if the markets in which we compete achieve the forecasted growth, our business may not grow at similar rates, or at all.

We intend to initially focus our product candidate development on treatments for various neuropsychiatric disorders and neurodegenerative diseases. Our projections of addressable patient populations within any particular disease state that may benefit from treatment with our product candidates are based on our estimates. Market opportunity estimates and growth forecasts included in our public disclosures are subject to significant uncertainty and are based on assumptions and estimates. These estimates, which have been derived from a variety of sources, including scientific literature, surveys of clinics, patient foundations, and market research, may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of these diseases. Additionally, the potentially addressable patient population for our product candidates may not ultimately be amenable to treatment with our product candidates. Our market opportunity may also be limited by future competitor treatments that enter the market. If any of our estimates prove to be inaccurate, the market opportunity for any product candidate that we or our strategic partners develop could be significantly diminished and have an adverse material impact on our business.

Even if approved, our products may not gain market acceptance, in which case we may not be able to generate product revenues, which will materially adversely affect our business, financial condition, and results of operations.

Even if the FDA or any comparable foreign regulatory authority approves the marketing of any product candidates that we develop, physicians, healthcare providers, patients, or the medical community may not accept or use them. Additionally, the product candidates that we are developing are based on our proprietary approach, which are new technologies. If these products do not achieve an adequate level of acceptance, we may not generate significant product revenues or any profits from operations. The degree of market acceptance of any of our product candidates will depend on a variety of factors, including:

- the timing of market introduction of the product candidate as well as competitive products;
- the clinical indications for which a product candidate is approved;
- the terms of any approvals and the countries in which approvals are obtained;
- the number and clinical profile of competing products;
- the potential and perceived advantages of our product candidates over alternative treatments;
- our ability to provide acceptable evidence of safety and efficacy;
- the prevalence and severity of any side effects;
- the availability of an approved product candidate for use as a combination therapy;
- relative convenience and ease of administration;
- cost-effectiveness;
- patient diagnostics and screening infrastructure in each market;
- the effectiveness of sales and marketing efforts;
- approval of other new therapies for the same indications;
- marketing and distribution support;
- adverse publicity about our product candidates;
- availability of coverage, adequate reimbursement and sufficient payment from health maintenance organizations and other insurers, both public and private, for our product candidates, or the procedures utilizing our product candidates, if approved;
- the willingness of patients to pay out-of-pocket in the absence of coverage by third-party payors and government authorities; and
- other potential advantages over alternative treatment methods.

If our product candidates fail to gain market acceptance, this will have a material adverse impact on our ability to generate revenues to provide a satisfactory, or any, return on our investments. Even if some products achieve market acceptance, the market may prove not to be large enough to allow us to generate significant revenues.

We currently have no marketing, sales, or distribution infrastructure and we intend to either establish a sales and marketing infrastructure or outsource this function to a third party. Either of these commercialization strategies carries substantial risks to us.

Given our stage of development, we currently have no marketing, sale, and distribution capabilities. If any of our product candidates complete clinical development and are approved, we intend to either establish a sales and marketing organization with technical expertise and supporting distribution capabilities to commercialize our product candidates, or to outsource this function to a third party. There are risks involved if we decide to establish our own sales and marketing capabilities or enter into arrangements with third parties to perform these services. To the extent that we enter into collaboration agreements with respect to marketing, sales or distribution, our product revenue may be lower than if we directly marketed or sold any approved products. Such collaborative arrangements with partners may place the commercialization of our products outside of our control and would make us subject to a number of risks including that we may not be able to control the amount or timing of resources that our collaborative partner devotes to our products or that our collaborator's willingness or ability to complete its obligations, and our obligations under our arrangements may be adversely affected by business combinations or significant changes in our collaborator's business strategy.

If we are unable to enter into these arrangements on acceptable terms or at all, we may not be able to successfully commercialize any approved products. If we are not successful in commercializing any approved products, either on our own or through collaborations with one or more third parties, our future product revenue will suffer and we may incur significant additional losses, which would have a material adverse effect on our business, financial condition, and results of operations.

We may become exposed to costly and damaging liability claims, either when testing our product candidates in the clinic or at the commercial stage, and our product liability insurance may not cover all damages from such claims.

We are exposed to potential product liability and professional indemnity risks that are inherent in the research, development, manufacturing, marketing, and use of biopharmaceutical products. While we currently have no products that have been approved for commercial sale, the future use of product candidates by us in clinical trials, and the sale of any approved products in the future, may expose us to liability claims. These claims might be made by patients that use the product, healthcare providers, pharmaceutical companies, or others selling such products. Any claims against us, regardless of their merit, could be difficult and costly to defend and could materially adversely affect the market for our product candidates or any prospects for commercialization of our product candidates.

Although the clinical trial process is designed to identify and assess potential side effects, it is always possible that a drug, even after regulatory approval, may exhibit unforeseen side effects. If any of our product candidates were to cause adverse side effects during clinical trials or after approval of the product candidate, we may be exposed to substantial liabilities. Physicians and patients may not comply with any warnings that identify known potential adverse effects and patients who should not use our product candidates.

Even successful defense against product liability claims would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in: decreased demand for our product candidates; injury to our reputation; withdrawal of clinical trial participants; initiation of investigations by regulators; costs to defend the related litigation; a diversion of management's time and our resources; substantial monetary awards to trial participants or patients; product recalls, withdrawals or labeling, marketing or promotional restrictions; loss of revenue; exhaustion of any available insurance and our capital resources; the inability to commercialize any product candidate; and a decline in our share price.

Although we maintain product liability insurance for our product candidates, it is possible that our liabilities could exceed our insurance coverage. We intend to expand our insurance coverage to include the sale of commercial products if we obtain marketing approval for any of our product candidates. However, we may be unable to maintain insurance coverage at a reasonable cost or obtain insurance coverage that will be adequate to satisfy any liability that may arise. If a successful product liability claim or series of claims is brought against us for uninsured liabilities or in excess of insured liabilities, our assets may not be sufficient to cover such claims, and our business operations could be impaired.

Risks Related to Our Regulatory Environment

The development and commercialization of drug products is subject to extensive regulation, and the regulatory approval processes of the FDA and comparable foreign authorities are lengthy, time-consuming, and inherently unpredictable. If we are ultimately unable to obtain regulatory approval for our product candidates on a timely basis if at all, our business will be substantially harmed.

The clinical development, manufacturing, labeling, packaging, storage, recordkeeping, advertising, promotion, export, import, marketing, distribution, adverse event reporting, including the submission of safety and other post-marketing information and reports, and other possible activities relating to our product candidates are subject to extensive regulation. In the United States, obtaining marketing approval for a new drug requires the submission of a New Drug Application (NDA) to the FDA, and we are not permitted to market any product candidate in the United States until we obtain approval from the FDA of the NDA for that product candidate. An NDA must be supported by extensive clinical and preclinical data, as well as extensive information regarding pharmacology, chemistry, manufacturing, and controls. Outside the United States, many comparable foreign regulatory authorities employ similar approval processes.

We have not previously submitted an NDA to the FDA or similar marketing application to comparable foreign authorities, for any product candidate, and we cannot be certain that any of our product candidates will receive regulatory approval. Obtaining approval of an NDA can be a lengthy, expensive, and uncertain process, and as a company we have no experience with the preparation of an NDA submission or any other marketing application. In addition, the FDA has the authority to require a REMS as part of an NDA or after approval, which may impose further requirements or restrictions on the distribution or use of an approved drug, such as limiting prescribing to certain physicians or medical centers that have undergone specialized training, limiting treatment to patients who meet certain safe-use criteria and requiring treated patients to enroll in a registry.

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

- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our clinical trials;
- we may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that a product candidate is safe and effective for its proposed indication;
- the results of clinical trials may not meet the level of statistical significance required by the FDA or comparable foreign regulatory authorities for approval;
- we may be unable to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;
- the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our product candidates may not be sufficient to support the submission of an NDA or other submission or to obtain regulatory approval in the United States or elsewhere, or regulatory authorities may not accept a submission due to, among other reasons, the content or formatting of the submission;
- the FDA or comparable foreign regulatory authorities may fail to approve our manufacturing processes or facilities or those of third-party manufacturers with which we contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval.

This lengthy approval process, as well as the unpredictability of future clinical trial results, may result in our failing to obtain regulatory approval to market any of our product candidates, which would significantly harm our business, results of operations, and prospects. The FDA and comparable foreign regulatory authorities have substantial discretion in the approval process, and determining when or whether regulatory approval will be obtained for any of our product candidates. For example, regulatory authorities in various jurisdictions have in the past had, and may in the future have, differing requirements for, interpretations of and opinions on our clinical and preclinical data. As a result, we may be required to conduct additional preclinical studies, alter our proposed clinical trial designs, or conduct additional clinical trials to satisfy the regulatory authorities in each of the jurisdictions in which we hope to conduct clinical trials and develop and market our products, if approved. Further, even if we believe the data collected from clinical trials of our product candidates are promising, such data may not be sufficient to support approval by the FDA or any comparable foreign regulatory authority.

In addition, even if we were to obtain approval, regulatory authorities may approve any of our product candidates for fewer or more limited indications than we request, may not approve the price we intend to charge for our products, may grant approval contingent on the performance of costly post-marketing clinical trials, or may approve a product candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that product candidate. Any of the foregoing scenarios could materially harm the commercial prospects for our product candidates.

Furthermore, FDA and foreign regulatory authorities may change their approval policies and new regulations may be enacted. For instance, the EU pharmaceutical legislation is currently undergoing a complete review process, in the context of the Pharmaceutical Strategy for Europe initiative, launched by the European Commission in November 2020. The European Commission's proposal for revision of several legislative instruments related to medicinal products (potentially reducing the duration of regulatory data protection, revising the eligibility for expedited pathways, etc.) was published on April 26, 2023. The proposed revisions remain to be agreed and adopted by the European Parliament and European Council and the proposals may therefore be substantially revised before adoption, which is not anticipated before early 2026. The revisions may, however, have a significant impact on the pharmaceutical industry and our business in the long term.

Even if our product candidates obtain regulatory approval, we will be subject to ongoing obligations and continued regulatory review, which may result in significant additional expense. Additionally, our product candidates, if approved, could be subject to labeling and other restrictions and market withdrawal and we may be subject to penalties if we fail to comply with regulatory requirements or experience unanticipated problems with our products.

If the FDA or a comparable foreign regulatory authority approves any of our product candidates, the manufacturing processes, testing, safety, efficacy, labeling, packaging, distribution, import, export, adverse event reporting, storage, advertising, promotion, and recordkeeping for the product will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, and registration, as well as continued compliance with current good manufacturing practices (cGMPs) and similar foreign requirements, and GCPs for any clinical trials that we conduct post-approval, all of which may result in significant expense and limit our ability to commercialize such products. In addition, any regulatory approvals that we receive for our product candidates may also be subject to limitations on the approved indicated uses for which the product may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing testing, including Phase 4 clinical trials, and additional surveillance to monitor the safety and efficacy of the product candidate.

Manufacturers and manufacturers' facilities are required to comply with extensive FDA and comparable foreign regulatory authority requirements, including ensuring that quality control and manufacturing procedures conform to cGMP and similar foreign regulations. As such, we and our contract manufacturers will be subject to continual review and inspections to assess compliance with cGMP and adherence to commitments made in any approved marketing application. Accordingly, we and others with whom we work must continue to expend time, money, and effort in all areas of regulatory compliance, including manufacturing, quality control, and distribution.

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

- issue warning letters or untitled letters;
- issue, or require us to issue, safety-related communications, such as safety alerts, field alerts, "Dear Doctor" letters to healthcare professionals, or import alerts;
- impose civil or criminal penalties;
- suspend, limit, or withdraw regulatory approval;
- suspend any of our preclinical studies and clinical trials;
- refuse to approve pending applications or supplements to approved applications;
- impose restrictions on our operations, including closing our and our contract manufacturers' facilities; or
- seize or detain products, refuse to permit the import or export of products, or require us to conduct a product recall.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate adverse publicity. Any failure to comply with ongoing regulatory requirements may significantly and adversely affect our ability to commercialize and generate revenue from our products, if approved. If regulatory sanctions are applied or if regulatory approval is withdrawn, the value of our company and our operating results will be adversely affected.

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

The FDA and other regulatory agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. If we are found or alleged to have improperly promoted off-label uses, we may become subject to significant liability.

The FDA and other regulatory agencies strictly regulate the promotional claims that may be made about drug products. These regulations include standards and restrictions for direct-to-consumer advertising, industry-sponsored scientific and educational activities, promotional activities involving the internet and off-label promotion. For example, any regulatory approval that the FDA grants is limited to those indications and patient populations for which a drug is deemed to be safe and effective by the FDA.

While physicians in the United States may choose, and are generally permitted, to prescribe products in their independent medical judgment for uses that are not described in the product's labeling and for uses that differ from those tested in clinical trials and approved by the regulatory authorities, our ability to promote any of our products candidates, if approved, will be narrowly limited to those indications and populations that are specifically approved by the FDA or such other regulatory agencies, and if we are found to have promoted such off-label uses, we may become subject to significant liability. For example, the federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The government has also required companies to enter into consent decrees or imposed permanent injunctions under which specified promotional conduct is changed or curtailed. If we cannot successfully manage the promotion of our product candidates, if approved, we could become subject to significant liability, which would materially adversely affect our business and financial condition.

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

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels, reductions in staffing, statutory, regulatory, and policy changes, the FDA's ability to hire and retain key personnel and accept the payment of user fees, and other events that may otherwise affect the FDA's ability to perform routine functions. Average review times at the FDA have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable. Disruptions at the FDA and other agencies may also slow the time necessary for new drugs or modifications to approved drugs to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, in recent years, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA employees and stop critical activities. In addition, during the COVID-19 pandemic, the FDA postponed most inspections of domestic and foreign manufacturing facilities at various points, and more recently there have been FDA staff cuts under the Trump administration. If a prolonged government shutdown occurs, or if staffing reductions or global health concerns prevent the FDA or other regulatory authorities from conducting their regular activities, it could significantly impact the ability of the FDA or other regulatory authorities to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

We are subject to U.S. and certain foreign export and import controls, sanctions, embargoes, anti-corruption laws, and anti-money laundering laws and regulations. Compliance with these legal standards could impair our ability to compete in domestic and international markets. We can face criminal liability and other serious consequences for violations, which can harm our business.

We are 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, the U.S. Foreign Corrupt Practices Act of 1977, as amended (FCPA), the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, and other state and national 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, contractors, and other collaborators from authorizing, promising, offering, or providing, directly or indirectly, improper payments or anything else of value to recipients in the public or private sector. We may engage third parties to sell our products outside the United States, to conduct clinical trials, and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We can be held liable for the corrupt or other illegal activities of our employees, agents, contractors, and other collaborators, even if we do not explicitly authorize or have actual knowledge of such activities. Any violations of the laws and regulations described above may result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences.

Our research and development activities could be affected or delayed as a result of possible restrictions on animal testing.

Certain laws and regulations require us to test our product candidates on animals before initiating clinical trials involving humans. Animal testing activities have been the subject of controversy and adverse publicity. Animal rights groups and other organizations and individuals have attempted to stop animal testing activities by pressing for legislation and regulation in these areas and by disrupting these activities through protests and other means. To the extent the activities of these groups are successful, our research and development activities may be interrupted, delayed, or become more expensive.

Our business operations and current and future relationships with healthcare professionals, principal investigators, consultants, vendors, customers, and third-party payors in the United States and elsewhere are subject to applicable anti-kickback, fraud and abuse, false claims, physician payment transparency, and other healthcare laws and regulations, which could expose us to substantial penalties, contractual damages, reputation harm, administrative burdens, and diminished profits.

Healthcare providers, healthcare facilities and institutions 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, healthcare facilities and institutions, principal investigators, consultants, customers, and third-party payors may expose us to broadly applicable fraud and abuse and other healthcare laws, including, without limitation, the federal Anti-Kickback Statute and the federal False Claims Act, that may constrain the business or financial arrangements and relationships through which we research, sell, market, and distribute any product candidates for which we obtain marketing approval. In addition, we may be subject to physician payment transparency laws and regulation by the federal government and by the states and foreign jurisdictions in which we conduct our business. The applicable federal, state, and foreign healthcare laws that affect our ability to operate include, but are not limited to, the following:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, offering, receiving, or providing any remuneration (including any kickback, bribe, or certain rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, lease, order or recommendation of, any good, facility, item or service, for which payment may be made, in whole or in part, under any U.S. federal healthcare program, such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- the U.S. federal civil and criminal false claims laws, including the civil False Claims Act, which prohibit, among other things, including through civil whistleblower or qui tam actions, individuals or entities from knowingly presenting, or causing to be presented, to the U.S. federal government, claims for payment or approval that are false or fraudulent, knowingly making, using, or causing to be made or used, a false record or statement material to a false or fraudulent claim, or from knowingly making a false statement to avoid, decrease, or conceal an obligation to pay money to the U.S. federal government. Pharmaceutical manufacturers can cause false claims to be presented to the U.S. federal government by, among other things, engaging in impermissible marketing practices, such as the off-label promotion of a product for an indication for which it has not received FDA approval. In addition, the government may assert that a claim including items and services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;
- the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA), which imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, 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 healthcare fraud statute implemented under HIPAA or specific intent to violate it in order to have committed a violation;
- the U.S. Physician Payments Sunshine Act and its implementing regulations, which requires, among other things, certain manufacturers of drugs and devices that are reimbursable under Medicare, Medicaid, or the Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare and Medicaid Services, or CMS, information related to certain payments and other transfers of value to 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 held by such physicians and their immediate family members;
- analogous U.S. state laws and regulations, including: state anti-kickback and false claims laws, which may apply to our business practices, including but not limited to, research, distribution, sales and marketing arrangements, and claims involving healthcare items or services reimbursed by any third-party payor, including private insurers; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information, which requires tracking gifts and other remuneration and items of value provided to healthcare professionals and entities; and state and local laws requiring the registration of pharmaceutical sales representatives; and
- similar healthcare laws and regulations in foreign jurisdictions, including reporting requirements detailing interactions with and payments to healthcare providers.

Ensuring that our internal operations and future business arrangements with third parties comply with applicable healthcare laws and regulations will involve substantial costs. It is not always possible to identify and deter employee misconduct or business noncompliance, and the precautions we take to detect and prevent inappropriate conduct may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. Efforts to ensure that our business arrangements will comply with applicable healthcare laws may involve substantial costs. We have entered into consulting and scientific advisory board arrangements with physicians and other healthcare providers, including some who could influence the use of our product candidates, if approved. Compensation under some of these arrangements includes the provision of stock or stock options in addition to cash consideration. Because of the complex and far-reaching nature of these laws, it is possible that governmental authorities could conclude that our payments to physicians may not be fair market value for *bona fide* services or that our business practices do not comply with current or future statutes, regulations, agency guidance or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of the laws described above or any other governmental laws and regulations that may apply to us, we may be subject to significant penalties, including civil, criminal, and administrative penalties, damages, fines, exclusion from government-funded healthcare programs, such as Medicare and Medicaid, or similar programs in other countries or jurisdictions, integrity oversight and reporting obligations to resolve allegations of noncompliance, disgorgement, individual imprisonment, contractual damages, reputational harm, diminished profits, and the curtailment or restructuring of our operations. If any of the physicians or other providers or entities with whom we expect to do business are found to not be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs and imprisonment, which could affect our ability to operate our business. Further, defending against any such actions can be costly, time-consuming and may require significant personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

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

We are exposed to the risk of employee fraud or other misconduct. We cannot ensure that our compliance controls, policies, and procedures will in every instance protect us from acts committed by our employees, agents, contractors, or collaborators that would violate the laws or regulations of the jurisdictions in which we operate, including, without limitation, employment, foreign corrupt practices, trade restrictions and sanctions, environmental, competition, and patient privacy and other privacy laws and regulations. Misconduct by employees could include failures to comply with FDA regulations, provide accurate information to the FDA, comply with manufacturing standards we may establish, comply with federal and state healthcare fraud and abuse laws and regulations, report financial information or data accurately, or disclose unauthorized activities to us. In particular, sales, marketing, and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing, and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, labeling, marketing and promotion, sales commission, customer incentive programs, and other business arrangements. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations.

If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a material and adverse effect on our business, financial condition, results of operations and prospects, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, individual imprisonment, disgorgement of profits, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, additional reporting or oversight obligations if we become subject to a corporate integrity agreement or other agreement to resolve allegations of noncompliance with the law, and curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and pursue our strategy.

Current and future legislation may increase the difficulty and cost for us and any future collaborators to obtain marketing approval of and commercialize our product candidates and affect the prices we, or they, may obtain.

In the United States and other jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes and proposed changes to the healthcare system that could affect our future results of operations. In particular, there have been and continue to be a number of initiatives at the U.S. federal and state levels that seek to reduce healthcare costs and improve the quality of healthcare. For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act (collectively, the ACA), was enacted, which substantially changed the way healthcare is financed by both governmental and private payors. Among the provisions of the ACA of importance to the biopharmaceutical and biotechnology industries are the following:

- manufacturers and importers of certain branded prescription drugs are required to pay an annual, nondeductible fee according to their market share of all such sales;

- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program, to 23.1% of the average manufacturer price for most branded drugs, and to 13.0% for generic drug;
- a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs, including our product candidates, that are inhaled, infused, instilled, implanted, or injected;
- extension of manufacturers' Medicaid rebate liability to covered outpatient drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability;
- expansion of the entities eligible for discounts under the 340B drug pricing program;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; and
- establishment of a Center for Medicare and Medicaid Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

Since its enactment, there have been judicial and Congressional challenges to certain aspects of the ACA. On June 17, 2021, the U.S. Supreme Court dismissed the most recent judicial challenge to the ACA brought by several states without specifically ruling on the constitutionality of the ACA. Thus, the ACA remains in effect in its current form. On August 16, 2022, President Biden signed the Inflation Reduction Act of 2022 (the IRA) into law, which, among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in ACA marketplaces through plan year 2025. It is unclear how other healthcare reform measures of the Trump administration or other efforts, if any, to challenge, repeal or replace the ACA, will impact our business.

In addition, other legislative changes have been proposed and adopted in the United States since the ACA was enacted. For example, on March 11, 2021, President Biden signed the American Rescue Plan Act of 2021 into law, which eliminated the statutory Medicaid drug rebate cap, beginning January 1, 2024. The rebate was previously capped at 100% of a drug's average manufacturer price. Further, in August 2011, the Budget Control Act of 2011, among other things, included aggregate reductions of Medicare payments to providers. These reductions went into effect in April 2013 and, due to subsequent legislative amendments to the statute, will remain in effect until 2032, with the exception of a temporary suspension from May 1, 2020 through March 31, 2022, unless additional action is taken by Congress.

Moreover, heightened governmental scrutiny is likely to continue over the manner in which manufacturers set prices for their marketed products, which already has resulted in several Congressional inquiries, proposed and enacted legislation and executive orders issued by the President 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 drug products. Most recently, the IRA marks the most significant action by Congress with respect to the biopharmaceutical industry since adoption of the ACA in 2010. Among other things, the IRA requires manufacturers of certain drugs to engage in price negotiations with Medicare (beginning in 2026), imposes rebates under Medicare Part B and Medicare Part D to penalize price increases that outpace inflation (first due in 2023), and replaces the Part D coverage gap discount program with a new discounting program (which began on January 1, 2025). Manufacturers that fail to comply with the IRA may be subject to various penalties, including civil monetary penalties. The IRA permits the Secretary of the Department of Health and Human Services (HHS) to implement many of these provisions through guidance, as opposed to regulation, for the initial years. On August 15, 2024, HHS announced the agreed upon prices for the first ten drugs that are subject to price negotiations, which take effect in January 2026. HHS will select up to fifteen additional products covered under Part D for negotiation in 2025. Each year thereafter, more Part B and Part D products will become subject to the HHS price negotiation program, although the program is currently subject to legal challenges. For that and other reasons, it is currently unclear how the IRA will be effectuated, and while the impact of the IRA on the biopharmaceutical industry cannot yet be fully determined, it is likely to be significant.

Additionally, individual states in the United States have passed legislation and implemented regulations designed to control biopharmaceutical product pricing and costs. Similar developments have occurred outside of the United States, including in the European Union where healthcare budgetary constraints have resulted in restrictions on the pricing and reimbursement of medicines by relevant health service providers. To obtain reimbursement or pricing approval in some European Union member states, we may be required to conduct studies that compare the cost-effectiveness of our product candidates to other therapies that are considered the local standard of care.

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

Even if we are able to commercialize any product candidate, coverage and adequate reimbursement may not be available or such product candidate may become subject to unfavorable pricing regulations or third-party coverage and reimbursement policies, which would harm our business.

The regulations that govern regulatory approvals, pricing, and reimbursement for drug products vary widely from country to country. Some countries require approval of the sale price of a drug product before it can be marketed. In many countries, the pricing review period begins after marketing approval is granted. In some foreign markets, prescription drug product pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain regulatory approval for a product in a particular country, but then be subject to price regulations that delay our commercial launch of the product, possibly for lengthy time periods, and negatively impact the revenues we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if our product candidates obtain regulatory approval.

Our ability to commercialize any products successfully also will depend in part on the extent to which coverage and adequate reimbursement for these products and related treatments will be available from third-party payors, such as government authorities, private health insurers, and other organizations. Even if we succeed in bringing one or more products to the market, these products may not be considered cost-effective, and the amount reimbursed for any products may be insufficient to allow us to sell our products on a competitive basis. Because our programs are in the relatively early stages of development, we are unable at this time to determine their cost effectiveness or the likely level or method of coverage and reimbursement. Increasingly, the third-party payors who reimburse patients or healthcare providers are requiring that drug companies provide them with predetermined discounts from list prices, and are seeking to reduce the prices charged or the amounts reimbursed for drug products. If the price we are able to charge for any products we develop, or the coverage and reimbursement provided for such products, is inadequate in light of our development and other costs, our return on investment could be affected adversely.

There may be significant delays in obtaining reimbursement for newly-approved drug products, and coverage may be more limited than the purposes for which the drug product is approved by the FDA or comparable foreign regulatory authorities. Moreover, eligibility for reimbursement does not imply that any drugs product will be reimbursed in all cases or at a rate that covers our costs, including research, development, manufacture, sale, and distribution.

Interim reimbursement levels for new drug products, if applicable, may also be insufficient to cover our costs and may not be made permanent. Reimbursement rates may be based on payments allowed for lower cost drug products that are already reimbursed, may be incorporated into existing payments for other services and may reflect budgetary constraints or imperfections in Medicare data. Net prices for drug products may be reduced by mandatory discounts or rebates required by third-party payors and by any future relaxation of laws that presently restrict imports of drug products from countries where they may be sold at lower prices than in the United States. Obtaining coverage and adequate reimbursement for our product candidates may be particularly difficult because of the higher prices often associated with drugs administered under the supervision of a physician.

Further, no uniform policy for coverage and reimbursement exists in the United States, and coverage and reimbursement can differ significantly from payor to payor. Third-party payors often follow Medicare coverage policy and payment limitations in setting their own reimbursement rates, but also have their own methods and approval process apart from Medicare determinations. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of our product candidates to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. 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 assure that other payors 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.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal, and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare. The continuing efforts of the government, insurance companies, managed care organizations, and other payors of healthcare services to contain or reduce costs of healthcare and/or impose price controls may adversely affect:

- the demand for our product candidates, if we obtain regulatory approval;
- our ability to set a price that we believe is fair for our products;
- our ability to obtain coverage and reimbursement approval for a product;

- our ability to generate revenue and achieve or maintain profitability;
- the level of taxes that we are required to pay; and
- the availability of capital.

Our inability to promptly obtain coverage and adequate reimbursement from both third-party payors for the product candidates that we may develop and for which we obtain regulatory approval could have a material and adverse effect on our business, financial condition, results of operations, and prospects.

We face potential liability related to the privacy of health information we utilize in the development of product candidates, as well as information we obtain from clinical trials sponsored by us from research institutions and directly from individuals.

The global data protection landscape is rapidly evolving and we and our partners and vendors are, or may become, subject to various federal, state, and foreign data protection laws and regulations that address personal information, data privacy and security. Implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future, and we cannot yet determine the impact future laws, regulations, standards, or perception of their requirements may have on our business. This evolution may create uncertainty in our business, affect our ability to operate in certain jurisdictions or to collect, store, transfer use and share personal information, necessitate the acceptance of more onerous obligations in our contracts, result in liability or impose additional costs on us. The cost of compliance with these laws, regulations and standards is high and is likely to increase in the future. If we fail to comply with these laws and regulations, we may be subject to litigation, regulatory investigations, enforcement notices, enforcement actions, fines, and criminal or civil penalties, as well as adverse publicity and a potential loss of business.

In the United States, numerous federal and state laws and regulations, including state data breach notification laws, state health information privacy laws, and federal and state consumer protection laws and regulations that govern the collection, use, disclosure, and protection of health-related and other personal information could apply to our operations or the operations of our partners. For example, most healthcare providers, including research institutions from which we obtain patient health information, are subject to privacy and security regulations promulgated under HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009. HIPAA imposes obligations on "covered entities," including certain healthcare providers, health plans and healthcare clearinghouses, as well as their respective "business associates" that create, receive, maintain or transmit individually identifiable health information for or on behalf of a covered entity, with respect to safeguarding the privacy, security and transmission of individually identifiable health information. We could potentially face substantial criminal or civil penalties if we violate HIPAA. For example, we could be subject to significant penalties if we knowingly receive individually identifiable health information from a HIPAA-covered healthcare provider or research institution that has not satisfied HIPAA's requirements for disclosure of individually identifiable health information, or otherwise violate applicable HIPAA requirements related to the protection of such information.

Furthermore, the Federal Trade Commission (FTC) also has authority to initiate enforcement actions against entities that mislead customers about HIPAA compliance, make deceptive statements about privacy and data sharing in privacy policies, fail to limit third-party use of personal health information, fail to implement policies to protect personal health information or engage in other unfair practices that harm customers or that may violate Section 5 of the FTC Act. Even when HIPAA does not apply, according to the FTC violating consumers' privacy rights or failing to take appropriate steps to keep consumers' personal information secure may constitute a violation of the FTC Act. The FTC expects a company's data security measures to be reasonable and appropriate in light of the sensitivity and volume of consumer information it holds, the size and complexity of its business, and the cost of available tools to improve security and reduce vulnerabilities. Additionally, federal and state consumer protection laws are increasingly being applied by FTC and states' attorneys general to regulate the collection, use, storage, and disclosure of personal or personally identifiable information, through websites or otherwise, and to regulate the presentation of website content.

We may maintain certain sensitive information about individuals, including health-related information, that we receive throughout the clinical trial process, in the course of our research collaborations, and directly from individuals (or their healthcare providers) who enroll in our patient assistance programs. As such, we may be subject to state laws and regulations governing the privacy and security of personal information or requiring notification of affected individuals and state regulators in the event of a breach of personal information. Such laws and regulations will be subject to interpretation by various courts and other governmental authorities, thus creating potentially complex compliance issues for us and our future customers and strategic partners. For example, the California Consumer Privacy Act, as amended by the California Privacy Rights Act (collectively, the CCPA) requires covered businesses that process the personal information of California residents to, among other things: (i) provide certain disclosures to California residents regarding the business's collection, use, and disclosure of their personal information; (ii) receive and respond to requests from California residents to access, delete, and correct their personal information, or to opt out of certain disclosures of their personal information; and (iii) enter into specific contractual provisions with service providers that process California resident personal information on the business's behalf. Although there are limited exemptions for health-related information, including clinical trial data, the CCPA may increase our compliance costs and potential liability. Similar laws have been passed in other states, and are continuing to be proposed at the state and federal level, reflecting a trend toward more stringent privacy legislation in the United States. The enactment of such laws could have potentially conflicting requirements that would make compliance challenging.

Complying with U.S. federal and state data privacy and security laws, regulations, amendments to or re-interpretations of existing data privacy and security laws and regulations and contractual or other obligations relating to privacy, data protection, data transfers, data localization or information security may require us to make changes to our processes, incur substantial operational costs, modify our data practices and policies and restrict our business operations. Any actual or perceived failure by us to comply with these laws, regulations or other obligations may lead to significant fines, penalties, regulatory investigations, lawsuits, significant costs for remediation, damage to our reputation or other liabilities.

We are also or may become subject to rapidly evolving data protection laws, rules and regulations in foreign jurisdictions. Any clinical trial programs and research collaborations that we engage in outside the United States may implicate international data protection laws, including, in the European Economic Area (EEA), the General Data Protection Regulation (GDPR), which became effective in 2018. The GDPR imposes stringent operational requirements for processors and controllers of the personal data of individuals within the EEA. Among other things, the GDPR requires detailed notices for clinical trial subjects and investigators, as well as requirements regarding the security of personal data and notification of data processing obligations or security incidents to appropriate data protection authorities or data subjects. If our privacy or data security measures fail to comply with the GDPR requirements, we may be subject to litigation, regulatory investigations, enforcement notices, enforcement actions requiring us to change the way we use personal data and/or fines. In addition to statutory enforcement, a personal data breach can lead to adverse publicity and a potential loss of business. Further, from January 1, 2021, companies have had to comply with both the GDPR and the United Kingdom GDPR (UK GDPR), which, together with the amended UK Data Protection Act 2018, imposes separate but similar obligations to those under the GDPR. The UK GDPR mirrors the fines under the GDPR, imposing fines up to the greater of €20 million (£17.5 million) or 4% of global turnover.

Among other requirements, the GDPR regulates transfers of personal data subject to the GDPR to third countries that have not been found to provide adequate protection to such personal data, including the United States, and the efficacy and longevity of current transfer mechanisms between the EEA and the United States remains uncertain. Case law from the Court of Justice of the European Union (CJEU) states that reliance on the standard contractual clauses - a standard form of contract approved by the European Commission as an adequate personal data transfer mechanism - alone may not necessarily be sufficient in all circumstances and that transfers must be assessed on a case-by-case basis. On July 10, 2023, the European Commission adopted its Adequacy Decision in relation to the new EU-US Data Privacy Framework (DPF) rendering the DPF effective as an EU GDPR transfer mechanism to U.S. entities self-certified under the DPF. On October 12, 2023, the UK Extension to the DPF also came into effect (as approved by the UK Government), as data transfer mechanism to U.S. entities self-certified under the DPF. As the regulatory guidance and enforcement landscape in relation to data transfers continue to develop, we could suffer additional costs, complaints, and/or regulatory investigations or fines, and/ or if we are otherwise unable to transfer personal data between and among countries and regions in which we operate, it could affect the manner in which we provide our services, the geographical location or segregation of our relevant systems and operations, and could adversely affect our financial results. These laws and regulations may apply, not only to us, but also to vendors that store or otherwise process data on our behalf, such as information technology vendors. If such a vendor misuses data we have provided to it, or fails to safeguard such data, we may be subject to litigation, regulatory investigations, enforcement notices, and/or enforcement actions, as well as adverse publicity and a potential loss of business.

We are likely to be required to expend significant capital and other resources to ensure ongoing compliance with applicable privacy and data security laws. Claims that we have violated individuals' privacy rights or breached our contractual obligations, even if we are not found liable, could be expensive and time-consuming to defend, and could result in adverse publicity that could harm our business. Moreover, even if we take all necessary action to comply with regulatory requirements, we could be subject to a hack or data breach, which could subject us to fines and penalties, as well as reputational damage.

Further, we use artificial intelligence (AI), machine learning, and automated decision-making technologies (collectively, AI Technologies) throughout our business. The regulatory framework for AI Technologies is rapidly evolving as many federal, state and foreign government bodies and agencies have introduced or are currently considering additional laws and regulations. Additionally, existing laws and regulations may be interpreted in ways that would affect the operation of our AI Technologies. As a result, implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future, and we cannot yet determine the impact future laws, regulations, standards, or market perception of their requirements may have on our business and may not always be able to anticipate how to respond to these laws or regulations.

Already, certain existing legal regimes (e.g., relating to data privacy) regulate certain aspects of AI Technologies, and new laws regulating AI Technologies are expected to enter into force in the United States and the EU in 2024. In the United States, the Biden administration issued a broad Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence (2023 AI Order), that sets out principles intended to guide AI design and deployment for the public and private sector and signals the increase in governmental involvement and regulation over AI Technologies. The 2023 AI Order established certain new requirements for the training, testing and cybersecurity of sophisticated AI models and large scale computer centers used to train AI models. The 2023 AI Order also instructed several other federal agencies to promulgate additional regulations within specific timeframes from the date of the 2023 AI Order regarding the use and development of AI Technologies. Agencies such as the Department of Commerce and the Federal Trade Commission have issued proposed rules governing the use and development of AI Technologies. Legislation related to AI Technologies has also been introduced at the federal level and is advancing at the state level. For example, on March 13, 2024, Utah passed the Utah AI Policy Act, which took effect in May 2024, imposing certain disclosure requirements on the use of AI, and on May 17, 2024, Colorado enacted the Colorado AI Act, which will take effect in February 2026. Further, the California Privacy Protection Agency is currently in the process of finalizing regulations under the CCPA regarding the use of automated decision-making. Such additional regulations may impact our ability to develop, use and commercialize AI Technologies in the future.

In Europe, on May 21, 2024, the European Union legislators approved the EU Artificial Intelligence Act (the "EU AI Act"), which establishes a comprehensive, risk-based governance framework for artificial intelligence in the EU market. The EU AI Act entered into force on August 2, 2024 and the majority of the substantive requirements will apply from August 2, 2026. The EU AI Act will apply to companies that develop, use and/or provide AI in the EU and includes requirements around transparency, conformity assessments and monitoring, risk assessments, human oversight, security, accuracy, general purpose AI and foundation models, and proposes fines for breach of up to 7% of worldwide annual turnover. In addition, on September 28, 2022, the European Commission proposed two Directives seeking to establish a harmonized civil liability regime for AI in the EU in order to facilitate civil claims in respect of harm caused by AI and to include AI-enabled products within the scope of the EU's existing strict product liability regime. Once fully applicable, the EU AI Act and the Liability Directives will have a material impact on the way AI is regulated in the EU. Recent case law from the CJEU has taken an expansive view of the scope of the GDPR's requirements around automated decision making and introduced uncertainty in the interpretation of these rules. The EU AI Act, and developing interpretation and application of the GDPR in respect of automated decision making, together with developing guidance and/or decisions in this area, may affect our use of AI Technologies and our ability to provide, improve or commercialize our business, require additional compliance measures and changes to our operations and processes, result in increased compliance costs and potential increases in civil claims against us, and could adversely affect our business, operations and financial condition.

It is possible that further new laws and regulations will be adopted in the United States and in other non-U.S. jurisdictions, or that existing laws and regulations, including competition and antitrust laws, may be interpreted in ways that would limit our ability to use AI Technologies for our business, or require us to change the way we use AI Technologies in a manner that negatively affects the performance of our business and the way in which we use AI Technologies. We may need to expend resources to adjust our operations in certain jurisdictions if the laws, regulations, or decisions are not consistent across jurisdictions. Further, the cost to comply with such laws, regulations, or decisions and/or guidance interpreting existing laws, could be significant and would increase our operating expenses (such as by imposing additional reporting obligations regarding our use of AI Technologies). Such an increase in operating expenses, as well as any actual or perceived failure to comply with such laws and regulations, could adversely affect our business, financial condition and results of operations.

Risks Related to Our Dependence on Third Parties

We contract with third parties for the manufacture of our product candidates. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or drugs or such quantities at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We do not currently have the infrastructure or internal capability to manufacture supplies of our product candidates for use in development and commercialization. We rely, and expect to continue to rely, on third-party manufacturers for the production of our product candidates for preclinical studies and clinical trials under the guidance of members of our organization. We do not have long-term supply agreements. Furthermore, while the raw materials for our product candidates are sourced from multiple suppliers, in some cases, the drug product is sourced from a single-source supplier. If we were to experience an unexpected loss of supply of any of our product candidates or any of our future product candidates for any reason, whether as a result of manufacturing, supply or storage issues or otherwise, we could experience delays, disruptions, suspensions or terminations of, or be required to restart or repeat, any pending or ongoing clinical trials.

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

- the failure of the third party to manufacture our product candidates according to our schedule, or at all, including if our third-party contractors give greater priority to the supply of other products over our product candidates or otherwise do not satisfactorily perform according to the terms of the agreements between us and them;
- the reduction or termination of production or deliveries by suppliers, or the raising of prices or renegotiation of terms;
- the termination or nonrenewal of arrangements or agreements by our third-party contractors at a time that is costly or inconvenient for us;
- the breach by the third-party contractors of our agreements with them;
- the failure of third-party contractors to comply with applicable regulatory requirements;
- the failure of the third party to manufacture our product candidates according to our specifications;
- the mislabeling of clinical supplies, potentially resulting in the wrong dose amounts being supplied or study drug or placebo not being properly identified;
- clinical supplies not being delivered to clinical sites on time, leading to clinical trial interruptions, or of drug supplies not being distributed to commercial vendors in a timely manner, resulting in lost sales; and
- the misappropriation of our proprietary information, including our trade secrets and know-how.

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

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

In January 2024, there was congressional activity, including the introduction of the BIOSECURE Act (H.R. 7085) in the House of Representatives and a substantially similar Senate bill (S.3558). The BIOSECURE Act was passed by the House of Representatives in September 2024. If these bills become law, or similar laws are passed, they would have the potential to severely restrict the ability of U.S. biopharmaceutical companies like us to purchase products or services from, or otherwise collaborate with, certain Chinese biotechnology companies “of concern” without losing the ability to contract with, or otherwise receive funding from, the U.S. government. It is possible some of our contractual counterparties, including WuXi AppTech and WuXi Biologics and other Chinese vendors, could be impacted by the legislation.

Supply sources could be interrupted from time to time and, if interrupted, there is no guarantee that supplies could be resumed within a reasonable time frame and at an acceptable cost or at all.

We rely on our manufacturers to purchase from third-party suppliers the materials necessary to produce our product candidates for our preclinical studies and intend to continue to rely on these third parties for any clinical trials that we undertake. There are a limited number of suppliers for raw materials that we use to manufacture our drugs and there may be a need to assess alternate suppliers to prevent a possible disruption of the manufacture of the materials necessary to produce our product candidates for our preclinical studies, clinical trials, and if approved, ultimately for commercial sale. We do not have any control over the process or timing of the acquisition of these raw materials by our manufacturers. Moreover, we currently do not have any agreements for the commercial production of these raw materials. We cannot be sure that these suppliers will remain in business, or that they will not be purchased by one of our competitors or another company that is not interested in continuing to produce these materials for our intended purpose. In addition, the lead time needed to establish a relationship with a new supplier can be lengthy, and we may experience delays in meeting demand in the event a new supplier must be used. The time and effort to qualify a new supplier could result in additional costs, diversion of resources, or reduced manufacturing yields, any of which would negatively impact our operating results. Although we generally do not begin a clinical trial unless we believe we have a sufficient supply of a product candidate to complete the clinical trial, any significant delay in the supply of a product candidate, or the raw material components thereof, for an ongoing clinical trial due to the need to replace a third-party manufacturer could considerably delay completion of our clinical trials, product testing, and potential regulatory approval of our product candidates. If our manufacturers or we are unable to purchase these raw materials after regulatory approval has been obtained for our product candidates, the commercial launch of our product candidates would be delayed or there would be a shortage in supply, which would impair our ability to generate revenues from the sale of our product candidates.

We rely, and expect to continue to rely, on third parties, including independent clinical investigators and CROs, to conduct our preclinical studies and clinical trials. If these third parties do not successfully carry out their contractual duties, comply with applicable regulatory requirements, or meet expected deadlines, we may not be able to obtain regulatory approval for or commercialize our product candidates and our business could be substantially harmed.

We do not currently have the ability to independently conduct any clinical trials. We have relied upon and plan to continue to rely upon third parties, including independent clinical investigators and third-party CROs, to conduct our preclinical studies and clinical trials and to monitor and manage data for our clinical and preclinical programs. We rely on these parties for execution of our preclinical studies and clinical trials, and control only certain aspects of their activities. Nevertheless, we are responsible for ensuring that each of our studies and trials is conducted in accordance with the applicable protocol, legal, regulatory, and scientific standards, and our reliance on these third parties does not relieve us of our regulatory responsibilities. We and our third-party contractors and CROs are required to comply with GCP requirements, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for all of our products candidates in clinical development. Regulatory authorities enforce these GCPs through periodic inspections of trial sponsors, principal investigators, and trial sites. If we or any of our CROs fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials comply with GCP regulations. In addition, our clinical trials must be conducted with product produced under cGMP regulations (or similar regulatory requirements outside of the United States). Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process.

Further, these investigators and CROs are not our employees and we will not be able to control, other than by contract, the amount of resources, including time, that they devote to our product candidates and clinical trials. If independent investigators or CROs fail to devote sufficient resources to the development of our product candidates, or if their performance is substandard, it may delay or compromise the prospects for approval and commercialization of any product candidates that we develop. In addition, the use of third-party service providers may require us to disclose our proprietary information to these parties, which could increase the risk that this information will be misappropriated.

Our CROs have the right to terminate their agreements with us in the event of an uncured material breach. In addition, some of our CROs have an ability to terminate their respective agreements with us if it can be reasonably demonstrated that the safety of the subjects participating in our clinical trials warrants such termination, if we make a general assignment for the benefit of our creditors, or if we are liquidated. Further, some of these agreements may also be terminated by such third parties on short notice, or under certain circumstances, including our insolvency.

There is a limited number of third-party service providers that specialize or have the expertise required to achieve our business objectives. Many of the third parties with whom we contract may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials or other drug development activities that could harm our competitive position. If any of our relationships with these third-party laboratories, CROs or clinical investigators terminate, we may not be able to enter into arrangements with alternative laboratories, CROs, or investigators or to do so in a timely manner or on commercially reasonable terms. If laboratories, CROs, or clinical investigators do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our preclinical or clinical protocols, regulatory requirements or for other reasons, our preclinical or 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 results of operations and the commercial prospects for our product candidates would be harmed, our costs could increase, and our ability to generate revenues could be delayed. Switching or adding additional laboratories or CROs (or investigators) involves additional cost and requires management time and focus. In addition, there is a natural transition period when a new laboratory or CRO commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines. Additionally, CROs may lack the capacity to absorb higher workloads or take on additional capacity to support our needs. Though we carefully manage our relationships with our contracted laboratories and CROs, there can be no assurance that we will not encounter similar challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition, and prospects.

Risks Related to Intellectual Property

We depend on intellectual property licensed or acquired from third parties and we are currently party to in-license agreements under which we acquired rights to use, develop, manufacture and/or commercialize certain of our proprietary technologies and product candidates. If we breach our obligations under these agreements or if any of these agreements is terminated, or otherwise experience disruptions to our business relationships with our licensors, we may be required to pay damages and/or lose our rights to such intellectual property and technology, which would harm our business.

We are dependent on patents, know-how, and proprietary technology, both our own and licensed from others. We are a party to intellectual property license agreements and in the future, we may enter into additional license agreements. For example, with respect to developing our product candidates, we have licensed or acquired, as the case may be, certain intellectual property from Amgen, Blackthorn, TSRI and Vanderbilt. These license and acquisition agreements impose, and we expect that future license and acquisition agreements will impose, various diligence, milestone payment, royalty and other obligations on us. If we fail to comply with our obligations under these agreements, we may be required to pay damages and the licensor may have the right to terminate the license. Any termination of these licenses could result in the loss of significant rights and could harm our ability to develop, manufacture and/or commercialize our product candidates. See the section titled "Business—Intellectual Property—In-Licensing and Collaboration Agreements" in the Annual Report on Form 10-K for additional information regarding these key agreements.

In addition, the agreements under which we license or acquire intellectual property or technology to or from third parties are complex, and certain provisions in such agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology or increase what we believe to be our financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations and prospects. Moreover, if disputes over intellectual property that we have licensed or acquired prevent or impair our ability to maintain our current licensing arrangements on commercially acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates. Our business also would suffer if any current or future licensors fail to abide by the terms of the license, if the licensors fail to enforce licensed patents against infringing third parties, if the licensed patents or other rights are found to be invalid or unenforceable, or if we are unable to enter into necessary licenses on acceptable terms. Moreover, our licensors may own or control intellectual property that has not been licensed to us and, as a result, we may be subject to claims, regardless of their merit, that we are infringing or otherwise violating the licensor's rights.

In addition, while we cannot currently determine the amount of the royalty obligations we would be required to pay on sales of future products, if any, the amounts may be significant. The amount of our future royalty obligations will depend on the technology and intellectual property we use in products that we successfully develop and commercialize, if any. Therefore, even if we successfully develop and commercialize products, we may be unable to achieve or maintain profitability.

If we are unable to successfully obtain rights to required third-party intellectual property rights or maintain the existing intellectual property rights we have, we may have to abandon development of the relevant research programs or product candidates and our business, financial condition, results of operations and prospects could suffer.

Licensing of intellectual property is of critical importance to our business and involves complex legal, business and scientific issues and is complicated by the rapid pace of scientific discovery in our industry.

Disputes may also arise between us and our current and future licensors regarding intellectual property subject to a license or collaboration agreement, including those relating to:

- the scope of rights granted under the license or collaboration agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the license agreement;
- our right to sublicense patent and other rights to third parties under collaborative development relationships;
- whether we are complying with our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of our product candidates, and what activities satisfy those diligence obligations;
- the priority of invention of patented technology;
- rights upon termination of the license agreements;
- the scope and duration of exclusivity obligations of each party to the license agreements;
- the amount and timing of payments owed under license agreements; and
- the allocation of ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors or collaborators and by us and our partners.

The resolution of any contractual interpretation dispute that may arise, if unfavorable to us, could have a material adverse effect on our business, financial condition, results of operations and prospects. Such resolution could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology, increase what we believe to be our financial or other obligations under the relevant agreement or decrease the third party's financial or other obligations under the relevant agreement. Furthermore, if disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates. We are generally also subject to all of the same risks with respect to protection of intellectual property that we license as we are for intellectual property that we own, which are described below. If we or our licensors fail to adequately protect this intellectual property, our ability to commercialize our products could suffer.

We depend, in part, on our licensors to file, prosecute, maintain, defend, and enforce certain patents and patent applications that are material to our business.

Certain patents and patent applications relating to our product candidates are owned or controlled by certain of our licensors. In some circumstances, we may not have the right to control the preparation, filing, prosecution, maintenance, and defense of patent applications or patents covering technology that we license from third parties. In such circumstances, our licensors generally have rights to file, prosecute, maintain, and defend the licensed patents in their name, generally with our right to comment on such filing, prosecution, maintenance, and defense, with some obligation for the licensor to consider or incorporate our comments. We generally have the first right to enforce our exclusively licensed patent rights against third parties, although our ability to settle such claims often requires the consent of the licensor. If our licensors or any future licensees having rights to file, prosecute, maintain, and defend our patent rights fail to conduct these activities for patents or patent applications covering any of our product candidates, our ability to develop and commercialize those product candidates may be adversely affected and we may not be able to prevent competitors from making, using, or selling competing products. We cannot be certain that such activities by our licensors have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents or other intellectual property rights. Pursuant to the terms of the license agreements with some of our licensors, the licensors may have the right to control enforcement of our licensed patents or defense of any claims asserting the invalidity of these patents and, even in the circumstances where we have the right to pursue such enforcement or defense, we cannot ensure the cooperation of our licensors. We cannot be certain that our licensors will allocate sufficient resources or prioritize their or our enforcement of such patents or defense of such claims to protect our interests in the licensed patents. Even if we are not a party to these legal actions, an adverse outcome could harm our business because it might prevent us from continuing to license intellectual property that we may need to operate our business. In addition, even when we have the right to control patent prosecution of licensed patents and patent applications, enforcement of licensed patents, or defense of claims asserting the invalidity of those patents, we may still be adversely affected or prejudiced by actions or inactions of our licensors and their counsel that took place prior to or after our assuming control. This could cause us to lose rights in any applicable intellectual property that we in-license, and as a result our ability to develop and commercialize product candidates may be adversely affected and we may be unable to prevent competitors from making, using and selling competing products.

Given the breadth of the application of our precision neuroscience approach, in order to increase our ability to exploit our technologies, we may enter into collaborations and/or strategic partnerships in the future, and we may not realize the anticipated benefits of such collaborations or partnerships. We may not be able to do so or to realize the potential benefits of such transactions, which may cause us to alter or delay our development and commercialization plans.

Research and development collaborations and strategic partnerships are prevalent in the biopharmaceutical industry. The breadth of the application of our precision neuroscience approach is an attractive technology for potential collaborations and/or strategic partnerships. Our existing and any future collaborations or strategic partnerships are subject to numerous risks, which may include the following:

- collaborators have significant discretion in determining the efforts and resources that they will apply to a collaboration, and may not commit sufficient efforts and resources, or may misapply those efforts and resources;
- collaborators may not pursue development and commercialization of collaboration product candidates or may elect not to continue or renew development or commercialization programs based on clinical trial results or changes in their strategic focus;
- collaborators may delay, provide insufficient resources to, or modify or stop clinical trials for collaboration product candidates;
- collaborators could develop or acquire products outside of the collaboration that compete directly or indirectly with our products or product candidates;
- collaborators may not properly maintain or defend our intellectual property rights or may use our intellectual property or proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential liability;
- disputes may arise between us and a collaborator that cause the delay or termination of the research, development or commercialization of our product candidates, or that result in costly litigation or arbitration that diverts management attention and resources;
- collaborations may be terminated and, if terminated, may result in a need for additional capital and personnel to pursue further development or commercialization of the applicable product candidates; and
- collaborators may own or co-own intellectual property covering our products that results from our collaborating with them, and in such cases, we may not have the exclusive right to commercialize such intellectual property.

The development and potential commercialization of our product candidates will require substantial additional capital to fund expenses. We may form or seek further strategic alliances, create joint ventures or collaborations, or enter into additional licensing arrangements with third parties that we believe will complement or augment our development and commercialization efforts with respect to our product candidates and any future product candidates that we may develop, including in territories outside the United States or for certain indications. These transactions can entail numerous operational and financial risks, including exposure to unknown liabilities, disruption of our business and diversion of our management's time and attention in order to manage a collaboration or develop acquired products, product candidates or technologies, incurrence of substantial debt or dilutive issuances of equity securities to pay transaction consideration or costs, higher than expected collaboration, acquisition or integration costs, write-downs of assets or goodwill or impairment charges, increased amortization expenses, difficulty and cost in facilitating the collaboration or combining the operations and personnel of any acquired business, impairment of relationships with key suppliers, manufacturers or customers of any acquired business due to changes in management and ownership and the inability to retain key employees of any acquired business. As a result, if we enter into acquisition or in-license agreements or strategic partnerships, we may not be able to realize the benefit of such transactions if we are unable to successfully integrate them with our existing operations and company culture, which could delay our timelines or otherwise adversely affect our business. We also cannot be certain that, following a strategic transaction or license, we will achieve the revenue or specific net income that justifies such transaction or such other benefits that led us to enter into the arrangement.

In addition, we face significant competition in seeking appropriate strategic partners and the negotiation process is time-consuming and complex. We may not be successful in our efforts to establish a strategic partnership or other alternative arrangements for our product candidates because they may be deemed to be at too early of a stage of development for collaborative effort and third parties may not view our product candidates as having the requisite potential to demonstrate safety and efficacy. If and when we collaborate with a third party for development and commercialization of a product candidate, we can expect to relinquish some or all of the control over the future success of that product candidate to the third party. Our ability to reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of our technologies, product candidates and market opportunities. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us for our product candidate. We may also be restricted under any license agreements from entering into agreements on certain terms or at all with potential collaborators.

As a result of these risks, we may not be able to realize the benefit of our existing collaboration or any future collaborations or licensing agreements we may enter into. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators and changes to the strategies of the combined company. As a result, we may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of such product candidate, reduce or delay one or more of our other development programs, delay the potential commercialization or reduce the scope of any planned sales or marketing activities for such product candidate, or increase our expenditures and undertake development, manufacturing or commercialization activities at our own expense. If we elect to increase our expenditures to fund development, manufacturing or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop our product candidates or bring them to market and generate product revenue.

Our product candidates may also require specific components to work effectively and efficiently, and rights to those components may be held by others. We may be unable to in-license any compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, which would harm our business. In that event, we may be required to expend significant time and resources to develop or license replacement technology. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. Any delays in entering into new collaborations or strategic partnership agreements related to our product candidates could delay the development and commercialization of our product candidates in certain geographies, which could harm our business prospects, financial condition and results of operations.

Moreover, some of our owned and in-licensed patents or patent applications or future patents are or may be co-owned with third parties. If we are unable to obtain an exclusive license to any such third-party co-owners' interest in such patents or patent applications, such co-owners may be able to license their rights to other third parties, including our competitors, and our competitors could market competing products and technology. In addition, we may need the cooperation of any such co-owners of our patents in order to enforce such patents against third parties, and such cooperation may not be provided to us. Furthermore, our owned and in-licensed patents may be subject to a reservation of rights by one or more third parties. Any of the foregoing could have a material adverse effect on our competitive position, business, financial condition, results of operations and prospects.

We may not be successful in obtaining or maintaining necessary rights for our product pipeline which may cause us to operate our business in a more costly or otherwise adverse manner that was not anticipated.

We own or license from third parties certain intellectual property rights necessary to develop our product candidates. The growth of our business will likely depend in part on our ability to acquire or in-license additional proprietary rights, including to expand our product pipeline. In that event, we may be required to expend considerable time and resources to develop or license replacement technology. For example, our programs may involve additional technologies or product candidates that may require the use of additional proprietary rights held by third parties. Furthermore, other pharmaceutical companies and academic institutions may also have filed or are planning to file patent applications potentially relevant to our business. Our product candidates may also require specific formulations or other technology to work effectively and efficiently. These formulations or technology may be covered by intellectual property rights held by others. From time to time, in order to avoid infringing these third-party rights, we may be required to license technology from additional third parties to further develop or commercialize our product candidates. We may be unable to acquire or in-license any relevant third-party intellectual property rights, including any such intellectual property rights required to manufacture, use or sell our product candidates, that we identify as necessary or important to our business operations. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all, and as a result we may be unable to develop or commercialize the affected product candidates, which would harm our business. We may need to cease use of the compositions or methods covered by such third-party intellectual property rights, and may need to seek to develop alternative approaches that do not infringe on such intellectual property rights which may entail additional costs and development delays, even if we were able to develop such alternatives, which may not be feasible. Even if we are able to obtain a license under such intellectual property rights, any such license may be non-exclusive, which may allow our competitors' access to the same technologies licensed to us.

Additionally, we sometimes collaborate with academic institutions to accelerate our preclinical research or development under written agreements with these institutions. Typically, these institutions provide us with an option to negotiate a license to any of the institution's rights in technology resulting from the collaboration. Regardless of such option, we may be unable to negotiate a license within the specified timeframe or under terms that are acceptable to us. If we are unable to do so, the institution may offer the intellectual property rights to other parties, potentially blocking our ability to pursue our program. If we are unable to successfully obtain rights to required third-party intellectual property or to maintain the existing intellectual property rights we have, we may have to abandon development of such program and our business and financial condition could suffer.

The licensing and acquisition of third-party intellectual property rights is a competitive practice, and companies that may be more established, or have greater resources than we do, may also be pursuing strategies to license or acquire third-party intellectual property rights that we may consider necessary or attractive in order to commercialize our product candidates. More established companies may have a competitive advantage over us due to their larger size and cash resources or greater clinical development and commercialization capabilities.

There can be no assurance that we will be able to successfully complete such negotiations and ultimately acquire the rights to the intellectual property surrounding the additional product candidates that we may seek to acquire.

We may be dependent on intellectual property licensed or sublicensed to us from, or for which development was funded or otherwise assisted by, the U.S. government and/or government agencies, such as the National Institutes of Health, for development of our technology and product candidates. Failure to meet our own obligations to our licensors or upstream licensors, including such government agencies, may result in the loss of our rights to such intellectual property, which could harm our business.

The U.S. government and/or government agencies have provided, and in the future may provide, funding, facilities, personnel or other assistance in connection with the development of the intellectual property rights owned by or licensed to us. The U.S. government and/or government agencies may have retained rights in such intellectual property, including the right to grant or require us to grant mandatory licenses or sublicenses to such intellectual property to third parties under certain specified circumstances, including if it is necessary to meet health and safety needs that we are not reasonably satisfying or if it is necessary to meet requirements for public use specified by federal regulations, or to manufacture products in the United States. Any exercise of such rights, including with respect to any such required sublicense of these licenses, could result in the loss of significant rights and could harm our ability to commercialize licensed products. For example, the research resulting in certain of our in-licensed patent rights and technology was funded in part by the U.S. government. As a result, the government may have certain rights, or march-in rights, to such patent rights and technology. These rights may permit the government to disclose our confidential information to third parties and to exercise march-in rights to use or allow third parties to use our licensed technology.

If we are unable to obtain and maintain sufficient intellectual property protection for our product candidates and approach, or if the scope of the intellectual property protection is not sufficiently broad, our competitors could develop and commercialize products similar or identical to ours, and our ability to successfully commercialize our products may be adversely affected. We cannot ensure that patent rights relating to inventions described and claimed in our pending patent applications will issue or that patents based on our patent applications will not be challenged and rendered invalid and/or unenforceable.

We or our licensors have filed patent applications, and we anticipate that in the future we will file additional patent applications both in the United States and in other countries, as appropriate. However, we cannot predict:

- if and when any patents will issue;
- the degree and range of protection any issued patents will afford us against competitors, including whether third parties will find ways to invalidate or otherwise circumvent our patents;
- whether others will apply for or obtain patents claiming aspects similar to those covered by our patents and patent applications;
- whether we will need to initiate litigation or administrative proceedings to defend our patent rights, which may be costly whether we win or lose; or
- whether the patent applications that we own or in-license will result in issued patents with claims that cover our product candidates or uses thereof in the United States or in other foreign countries.

Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to our product candidates and approach. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our novel discoveries and technologies that are important to our business.

Obtaining and enforcing patents is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications or maintain and/or enforce patents that may issue based on our patent applications, at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development results before it is too late to obtain patent protection. Although we enter into non-disclosure and confidentiality agreements with parties who have access to patentable aspects of our research and development output, such as our employees, corporate collaborators, outside scientific collaborators, CROs, contract manufacturers, consultants, advisors and other third parties, any of these parties may breach these agreements and disclose such results before a patent application is filed, thereby jeopardizing our ability to seek patent protection.

Our ability to enforce patent rights also depends on our ability to detect infringement. It may be difficult to detect infringers who do not advertise the components or methods that are used in connection with their products and services. Such proceedings could also provoke third parties to assert claims against us, including that some or all of the claims in one or more of our patents are invalid or otherwise unenforceable. Moreover, it may be difficult or impossible to obtain evidence of infringement in a competitor's or potential competitor's product or service. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded if we were to prevail may not be commercially meaningful. If we initiate lawsuits to protect or enforce our patents, or litigate against third-party claims, such proceedings would be expensive and would divert the attention of our management and technical personnel.

Composition of matter patents for biopharmaceutical products often provide a strong form of intellectual property protection for those types of products, as such patents provide protection without regard to any method of use. We cannot be certain, however, that the claims in our pending patent applications covering the composition of matter of our product candidates will be considered patentable by the United States Patent and Trademark Office (USPTO), or by patent offices in foreign countries, or that the claims in any of our issued patents will be considered valid and enforceable by courts in the United States or foreign countries. Method of use patents protect the use of a product for the specified method. This type of patent does not prevent a competitor from making and marketing a product that is identical to our product for an indication that is outside the scope of the patented method. Moreover, even if competitors do not actively promote their product for our targeted indications, physicians may prescribe these products "off-label" for those uses that are covered by our method of use patents. Although off-label prescriptions may infringe or contribute to the infringement of method of use patents, the practice is common and such infringement can be difficult to prevent or prosecute.

The strength of patents in the biotechnology, biopharmaceutical and data science fields can be uncertain, and evaluating the scope of such patents involves complex legal, factual and scientific analyses and has in recent years been the subject of much litigation, resulting in court decisions, including Supreme Court decisions, which have increased uncertainties as to the ability to enforce patent rights in the future. The patent applications that we own or in-license may fail to result in issued patents with claims that cover our product candidates or uses thereof in the United States or in other foreign countries. Even if the patents do successfully issue, third parties may challenge the validity, enforceability, or scope thereof, which may result in such patents being narrowed, invalidated, or held unenforceable. In the event of litigation or administrative proceedings, we cannot be certain that the claims in any of our issued patents will be considered valid by courts in the United States or foreign countries. Furthermore, even if they are unchallenged, our patents and patent applications may not adequately protect our intellectual property or prevent others from designing their products to avoid being covered by our claims. If the breadth or strength of protection provided by the patent applications we hold with respect to our product candidates is threatened, this could dissuade companies from collaborating with us to develop, and could threaten our ability to commercialize, our product candidates. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States, or vice versa. Further, if we encounter delays in our clinical trials, the period of time during which we could market our product candidates under patent protection would be reduced.

We may not identify relevant third-party patents or may incorrectly interpret the relevance, scope or expiration of a third-party patent, which might adversely affect our ability to develop and market our products.

We cannot guarantee that any of our patent searches or analyses, including the identification of relevant patents, the scope of patent claims or the expiration of relevant patents, are complete or thorough, nor can we be certain that we have identified each and every third-party patent and pending application in the United States and abroad that is relevant to or necessary for the commercialization of our product candidates in any jurisdiction. The scope of a patent claim is determined by an interpretation of the law, the written disclosure in a patent and the patent's prosecution history. Our interpretation of the relevance or the scope of a patent or a pending application may be incorrect, which may negatively impact our ability to market our products. We may incorrectly determine that our products are not covered by a third-party patent or may incorrectly predict whether a third party's pending application will issue with claims of relevant scope. Our failure to identify and correctly interpret relevant patents may negatively impact our ability to develop and market our products.

One aspect of the determination of patentability of our inventions depends on the scope and content of the "prior art," information that was or is deemed available to a person of skill in the relevant art prior to the priority date of the claimed invention. There may be prior art of which we are not aware that may affect the patentability of our patent claims or, if issued, affect the validity or enforceability of a patent claim. Further, we may not be aware of all third-party intellectual property rights potentially relating to our product candidates or their intended uses, and as a result the impact of such third-party intellectual property rights upon the patentability of our own patents and patent applications, as well as the impact of such third-party intellectual property upon our freedom to operate, is highly uncertain. Because patent applications in the United States and most other countries are confidential for typically a period of 18 months after filing, or may not be published at all, we cannot be certain that we were the first to file any patent application related to our product candidates. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Furthermore, for U.S. applications in which all claims are entitled to a priority date before March 16, 2013, an interference proceeding can be provoked by a third party or instituted by the USPTO to determine who was the first to invent any of the subject matter covered by the patent claims of our applications. For U.S. applications containing a claim not entitled to priority before March 16, 2013, there is a greater level of uncertainty in the patent law in view of the passage of the America Invents Act, which brought into effect significant changes to the U.S. patent laws, including new procedures for challenging pending patent applications and issued patents.

Our patents or pending patent applications may be challenged in the courts or patent offices in the United States and abroad. For example, we may be subject to a third-party pre-issuance submission of prior art to the USPTO or become involved in post-grant review procedures, oppositions, derivations, reexaminations, or *inter partes* review proceedings, in the United States or elsewhere, challenging our patent rights or the patent rights of others. An adverse determination in any such challenges may result in loss of exclusivity or in patent claims being narrowed, invalidated, or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. In addition, given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. Any failure to obtain or maintain patent protection with respect to our product candidates could have a material adverse effect on our business, financial condition, results of operations and prospects.

Intellectual property rights do not necessarily address all potential threats to our competitive advantage.

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

- others may be able to make product candidates that are similar to ours but that are not covered by the claims of the patents that we own or have exclusively licensed;
- we or our licensors or future collaborators might not have been the first to make the inventions covered by the issued patent or pending patent application that we own or have exclusively licensed;
- we or our licensors or future collaborators might not have been the first to file patent applications covering certain of our inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- it is possible that our pending patent applications will not lead to issued patents;
- issued patents that we own or have exclusively licensed may be held invalid or unenforceable, as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- we cannot predict the scope of protection of any patent issuing based on our patent applications, including whether the patent applications that we own or in-license will result in issued patents with claims that cover our product candidates or uses thereof in the United States or in other foreign countries;
- the claims of any patent issuing based on our patent applications may not provide protection against competitors or any competitive advantages, or may be challenged by third parties;
- if enforced, a court may not hold that our patents are valid, enforceable and infringed;
- we may need to initiate litigation or administrative proceedings to enforce and/or defend our patent rights which will be costly whether we win or lose;

- we may choose not to file a patent in order to maintain certain trade secrets or know-how, and a third party may subsequently file a patent covering such intellectual property;
- we may fail to adequately protect and police our trademarks and trade secrets; and
- the patents of others may have an adverse effect on our business, including if others obtain patents claiming subject matter similar to or improving that covered by our patents and patent applications.

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

Confidentiality agreements with employees and third parties may not prevent unauthorized disclosure of trade secrets and other proprietary information. If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to the protection afforded by patents, we rely on trade secret protection and confidentiality agreements to protect proprietary know-how that is not patentable or that we elect not to patent, processes for which patents are difficult to enforce, and any other elements of our product candidates, technology and product discovery and development processes that involve proprietary know-how, information, or technology that is not covered by patents. Any disclosure, either intentional or unintentional, by our employees, the employees of third parties with whom we share our facilities or third-party consultants and vendors that we engage to perform research, clinical trials or manufacturing activities, or misappropriation by third parties (such as through a cybersecurity breach) of our trade secrets or proprietary information could enable competitors to duplicate or surpass our technological achievements, thus eroding our competitive position in our market. Because we expect to rely on third parties in the development and manufacture of our product candidates, we must, at times, share trade secrets with them. Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.

Trade secrets and confidential information, however, may be difficult to protect. We seek to protect our trade secrets, know-how and confidential information, including our proprietary processes, in part, by entering into confidentiality agreements with our employees, consultants, outside scientific advisors, contractors, and collaborators. We require our employees to enter into written employment agreements containing provisions of confidentiality and obligations to assign to us any inventions generated in the course of their employment. With our consultants, contractors, and outside scientific collaborators, these agreements typically include invention assignment obligations. We cannot guarantee that we have entered into such agreements with each party that may have or has had access to our trade secrets or proprietary technology and processes. Although we use reasonable efforts to protect our trade secrets, our employees, consultants, outside scientific advisors, contractors, and collaborators might intentionally or inadvertently disclose our trade secret information to competitors. In addition, competitors may otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor or other third party, we would have no right to prevent them from using that technology or information to compete with us. Furthermore, the laws of some foreign countries do not protect proprietary rights to the same extent or in the same manner as the laws of the United States. As a result, we may encounter significant problems in protecting and defending our intellectual property both in the United States and abroad. If we are unable to prevent unauthorized material disclosure of our intellectual property to third parties, or misappropriation of our intellectual property by third parties, we will not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business, results of operations, and financial condition.

Third-party claims of intellectual property infringement against us or our collaborators may prevent or delay our product discovery and development efforts.

Our commercial success depends in part on our avoiding infringement of the patents and proprietary rights of third parties. There is a substantial amount of litigation involving patents and other intellectual property rights in the biotechnology and biopharmaceutical industries, as well as administrative proceedings for challenging patents, including interference, derivation, *inter partes* review, post-grant review and reexamination proceedings before the USPTO or oppositions and other comparable proceedings in foreign jurisdictions. Furthermore, patent reform and changes to patent laws add uncertainty to the possibility of challenge to our patents in the future. We cannot assure you that our product candidates and other proprietary technologies we may develop will not infringe existing or future patents owned by third parties. Litigation or other legal proceedings relating to intellectual property claims, with or without merit, is unpredictable and generally expensive and time consuming and, even if resolved in our favor, is likely to divert significant resources from our core business, including distracting our technical and management personnel from their normal responsibilities. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources and more mature and developed intellectual property portfolios. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

Numerous U.S. and foreign issued patents and pending patent applications owned by third parties exist in the fields in which we are developing our product candidates. We cannot provide any assurances that third-party patents do not exist which might be enforced against our current product candidates or future products, resulting in either an injunction prohibiting our sales, or, with respect to our sales, an obligation on our part to pay royalties and/or other forms of compensation to third parties. As the biotechnology and biopharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may give rise to claims of infringement of the patent rights of others. Third parties may assert that we infringe their patents or other intellectual property, or that we are otherwise employing their proprietary technology without authorization, and may sue us. There may be third-party patents of which we are currently unaware with claims to compositions, formulations, methods of manufacture, or methods of use or treatment that cover our product candidates. It is also possible that patents owned by third parties of which we are aware, but which we do not believe are relevant to our product candidates and other proprietary technologies we may develop, could be found to be infringed by our product candidate. Because patent applications can take many years to issue, there may be currently pending patent applications that may later result in issued patents that our product candidates may infringe. In addition, third parties, our competitors in both the United States and abroad, many of which have substantially greater resources and have made substantial investments in patent portfolios and competing technologies, may obtain patents in the future that may prevent, limit or otherwise interfere with our ability to make, use and sell our product candidates, and may claim that use of our technologies or the manufacture, use, or sale of our product candidates infringes upon these patents. If any such third-party patents were held by a court of competent jurisdiction to cover our technologies or product candidates, or if we are found to otherwise infringe a third party's intellectual property rights, the holders of any such patents may be able to block, including by court order, our ability to develop, manufacture or commercialize the applicable product candidate unless we obtain a license under the applicable patents or other intellectual property, or until such patents expire or are finally determined to be held invalid or unenforceable. Such a license may not be available on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. If we are unable to obtain a necessary license to a third-party patent on commercially reasonable terms, our ability to commercialize our product candidates may be impaired or delayed, which could in turn significantly harm our business.

The biopharmaceutical and biotechnology industries have produced a considerable number of patents, and it may not always be clear to industry participants, including us, which patents cover various types of products or methods of use. The coverage of patents is subject to interpretation by the courts, and the interpretation is not always uniform. If we were sued for patent infringement, we would need to demonstrate that our product candidates, products or methods either do not infringe the patent claims of the relevant patent or that the patent claims are invalid or unenforceable, and we may not be able to do this. Proving invalidity may be difficult. For example, in the United States, proving invalidity in court requires a showing of clear and convincing evidence to overcome the presumption of validity enjoyed by issued patents, and there is no assurance that a court of competent jurisdiction would invalidate the claims of any such U.S. patent. Even if we are successful in these proceedings, we may incur substantial costs and the time and attention of our management and scientific personnel could be diverted in pursuing these proceedings, which could have a material adverse effect on our business and operations. In addition, we may not have sufficient resources to bring these actions to a successful conclusion.

Third parties asserting their patent or other intellectual property rights against us may seek and obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize our product candidates or force us to cease some of our business operations. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of management and other employee resources from our business, cause development delays, and may impact our reputation. In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, obtain one or more licenses from third parties, pay royalties, or redesign our infringing products, which may be impossible on a cost-effective basis or require substantial time and monetary expenditure. In that event, we would be unable to further develop and commercialize our product candidates, which could harm our business significantly. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

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

Patents are of national or regional effect, and filing, prosecuting, maintaining and defending patents on product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can have a different scope and strength than do those in the United States. In addition, the laws of some foreign countries, particularly certain developing countries, do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and further, may export otherwise infringing products to territories where we have patent protection, but enforcement rights are not as strong as those in the United States. These products may compete with our products and our patents or other intellectual property rights may not be effective or adequate to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property, particularly those relating to biopharmaceutical products, which could make it difficult in those jurisdictions for us to stop the infringement or misappropriation of our patents or other intellectual property rights, or the marketing of competing products in violation of our proprietary rights. Proceedings to enforce our patent and other intellectual property rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business. Furthermore, such proceedings could put our patents at risk of being invalidated, held unenforceable, or interpreted narrowly, could put our patent applications at risk of not issuing, and could provoke third parties to assert claims of infringement or misappropriation against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful. Similarly, if our trade secrets are disclosed in a foreign jurisdiction, competitors worldwide could have access to our proprietary information and we may be without satisfactory recourse. Such disclosure could have a material adverse effect on our business. Moreover, our ability to protect and enforce our intellectual property rights may be adversely affected by unforeseen changes in foreign intellectual property laws. In addition, certain developing countries, including China and India, have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In those countries, we and our licensors may have limited remedies if patents are infringed or if we or our licensors are compelled to grant a license to a third party, which could materially diminish the value of those patents. In addition, many countries limit the enforceability of patents against government agencies or government contractors. This could limit our potential revenue opportunities. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

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

Finally, Europe's Unified Patent Court (UPC) may, in particular, present uncertainties for our ability to protect and enforce our patent rights against competitors in Europe. In 2012, the European Patent Package (EU Patent Package) regulations were passed with the goal of providing a single pan-European Unitary Patent system and UPC for litigation involving European patents.

The Unitary Patent system and UPC launched on June 1, 2023. Under the UPC, all European patents, including those issued prior to ratification of the EU Patent Package, now by default automatically fall under the jurisdiction of the UPC. The UPC provides our competitors with a new forum to centrally revoke our European patents, and allows for the possibility of a competitor to obtain pan-European injunctions. Such a loss of patent protection could have a material adverse impact on our ability to commercialize our technology and product candidates and on our business, financial condition, prospects and results of operations. It will be several years before we will understand the scope of patent rights that will be recognized and the strength of patent remedies that will be provided by the UPC. Under the current EU Patent Package, we have the right to opt our patents out of the UPC over the first seven years of the court's existence, but doing so may preclude us from realizing the benefits of the new unified court. Moreover, if we do not meet all of the formalities and requirements for opt-out under the UPC, our future European patents could remain under the jurisdiction of the UPC.

Because of the expense and uncertainty of litigation, we may conclude that even if a third party is infringing our issued patents, any patents that may be issued as a result of our pending or future patent applications or other intellectual property rights, the risk-adjusted cost of bringing and enforcing such a claim or action, which typically last for years before they are concluded, may be too high or not in the best interest of our company or our stockholders, or it may be otherwise impractical or undesirable to enforce our intellectual property against some third parties. Our competitors or other third parties may be able to sustain the costs of complex patent litigation or proceedings more effectively than we can because of their greater financial resources and more mature and developed intellectual property portfolios. In such cases, we may decide that the monetary cost of such litigation and the diversion of the attention of our management and scientific personnel could outweigh any benefit we receive as a result of the proceedings and that the more prudent course of action is to simply monitor the situation or initiate or seek some other non-litigious action or solution. In addition, the uncertainties associated with litigation could compromise our ability to raise the funds necessary to continue our clinical trials, continue our internal research programs, in-license needed technology or other product candidates, or enter into development partnerships that would help us bring our product candidates to market.

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

Competitors may infringe our patents or other intellectual property or the intellectual property of our licensors. To cease such infringement or unauthorized use, we may be required to file patent infringement claims, which can be expensive and time-consuming and divert the time and attention of our management and scientific personnel. Our pending patent applications cannot be enforced against third parties practicing the technology claimed in such applications unless and until a patent issues from such applications. In addition, in an infringement proceeding or a declaratory judgment action, a court may decide that one or more of our patents 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 the technology in question. An adverse result in any litigation or defense proceeding could put one or more of our patents at risk of being invalidated, held unenforceable, or interpreted narrowly and could put our patent applications at risk of not issuing. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business.

Interference or derivation proceedings provoked by third parties or brought by the USPTO may be necessary to determine the priority of inventions with respect to, or the correct inventorship of, our patents or patent applications or those of our licensors. An unfavorable outcome could result in a loss of our current patent rights and could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially\ reasonable terms. Litigation, interference, derivation or other proceedings may result in a decision adverse to our interests and, even if we are successful, may result in substantial costs and distract our management and other employees.

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

Issued patents covering our product candidates could be found invalid or unenforceable if challenged in court or before the USPTO or comparable foreign authority.

If we or one of our licensing partners initiate legal proceedings against a third party to enforce a patent covering one of our product candidates, the defendant could counterclaim we infringe their patents or that the patent covering our product candidate is invalid or unenforceable, or both. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace, and there are numerous grounds upon which a third party can assert invalidity or unenforceability of a patent, including lack of novelty, obviousness, non-enablement or insufficient written description or that someone connected with prosecution of the patent withheld relevant information from the USPTO or made a misleading statement during prosecution. Third parties may also raise similar claims before administrative bodies in the United States or abroad, even outside the context of litigation. Such mechanisms include re-examination, *inter partes* review, post-grant review, and equivalent proceedings in foreign jurisdictions, such as opposition or derivation proceedings. Such proceedings could result in revocation or amendment to our patents in such a way that they no longer cover and protect our product candidates. The outcome following legal assertions of invalidity and unenforceability is unpredictable. In any patent infringement proceeding, there is a risk that a court will decide that a patent of ours is invalid or unenforceable, in whole or in part, and that we do not have the right to stop the other party from using the invention at issue. There is also a risk that, even if the validity of such patents is upheld, the court will construe the patent's claims narrowly or decide that we do not have the right to stop the other party from using the invention at issue on the grounds that our patent claims do not cover the invention, or decide that the other party's use of our patented technology falls under the safe harbor to patent infringement under 35 U.S.C. § 271I(1). With respect to the validity of our patents, for example, we cannot be certain that there is no invalidating prior art of which we, our patent counsel, and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our product candidates and such an outcome may limit our ability to assert our patents against those parties or other competitors and may curtail or preclude our ability to exclude third parties from making and selling similar or competitive products. Such a loss of patent protection could have a material adverse impact on our business. Similarly, if we assert trademark infringement claims, a court may determine that the marks we have asserted are invalid or unenforceable, or that the party against whom we have asserted trademark infringement has superior rights to the marks in question. In this case, we could ultimately be forced to cease use of such trademarks.

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

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involves both technological and legal complexity, and is therefore costly, time-consuming, and inherently uncertain. Changes in either the patent laws or interpretation of the patent laws in the United States could increase the uncertainties and costs, and may diminish our ability to protect our inventions, obtain, maintain, and enforce our intellectual property rights and, more generally, could affect the value of our intellectual property or narrow the scope of our owned and licensed patents. Patent reform legislation in the United States and other countries, including the Leahy-Smith America Invents Act, or the Leahy-Smith Act, signed into law on September 16, 2011, could increase those uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. The Leahy-Smith Act includes provisions that affect the way patent applications are prosecuted, redefine prior art and provide more efficient and cost-effective avenues for competitors to challenge the validity of patents. These include allowing third-party submission of prior art to the USPTO during patent prosecution and additional procedures to attack the validity of a patent by USPTO administered post-grant proceedings, including post-grant review, *inter partes* review, and derivation proceedings. After March 2013, under the Leahy-Smith Act, the United States transitioned to a first inventor to file system in which, assuming that the other statutory requirements are met, the first inventor to file a patent application will be entitled to the patent on an invention regardless of whether a third party was the first to invent the claimed invention. A third party that files a patent application in the USPTO after March 2013, but before we file an application covering the same invention, could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by such third party. This will require us to be cognizant of the time from invention to filing of a patent application. Because patent applications in the United States and most other countries are confidential for a period of time after filing or until issuance, we cannot be certain that we or our licensors were the first to either (1) file any patent application related to our product candidates and other proprietary technologies we may develop or (2) invent any of the inventions claimed in our or our licensor's patents or patent applications. Even where we have a valid and enforceable patent, we may not be able to exclude others from practicing the claimed invention where the other party can show that they used the invention in commerce before our filing date or the other party benefits from a compulsory license. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

Recent U.S. Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents once obtained. Depending on decisions by Congress, the federal courts, the USPTO and the relevant law-making bodies in other countries, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future. We cannot predict how future decisions by Congress, the federal courts or the USPTO may impact the value of our patents.

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

Periodic maintenance fees on any issued patent are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent. The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment, and other similar provisions during the patent application process. Although an inadvertent lapse on us or our patent maintenance vendors, can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Noncompliance events that could result in abandonment or lapse of a patent or patent application include failure to respond to official actions within prescribed time limits, non-payment of fees, and failure to properly legalize and submit formal documents. In any such event, our competitors might be able to enter the market, which would have a material adverse effect on our business.

The lives of our patents may not be sufficient to effectively protect our products and business.

Patents have a limited lifespan. In the United States, if all maintenance fees are paid timely, the natural expiration of a patent is generally 20 years after its first effective filing date. Although various extensions may be available, the life of a patent, and the protection it affords, is limited. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such product candidates are commercialized. Even if patents covering our product candidates are obtained, once the patent life has expired for a product, we may be open to competition from biosimilar or generic medications. The launch of a generic version of one of our products in particular would be likely to result in an immediate and substantial reduction in the demand for that product, which could have a material adverse effect on our business, financial condition, results of operations and prospects. As a result, our patent portfolio may not provide us with sufficient rights to exclude others from commercializing product candidates similar or identical to ours. In addition, although upon issuance in the United States a patent's life can be increased based on certain delays caused by the USPTO, this increase can be reduced or eliminated based on certain delays caused by the patent applicant during patent prosecution. A patent term extension based on regulatory delay may be available in the United States. However, only a single patent can be extended for each marketing approval, and any patent can be extended only once, for a single product. Moreover, the scope of protection during the period of the patent term extension does not extend to the full scope of the claim, but instead only to the scope of the product as approved. Laws governing analogous patent term extensions in foreign jurisdictions vary widely, as do laws governing the ability to obtain multiple patents from a single patent family. Additionally, we may not receive an extension if we fail to exercise due diligence during the testing phase or regulatory review process, apply within applicable deadlines, fail to apply prior to expiration of relevant patents or otherwise fail to satisfy applicable requirements. If we are unable to obtain patent term extension or restoration, or the term of any such extension is less than we request, the period during which we will have the right to exclusively market our product will be shortened and our competitors may obtain approval of competing products following our patent expiration and may take advantage of our investment in development and clinical trials by referencing our clinical and preclinical data to launch their product earlier than might otherwise be the case, and our revenue could be reduced, possibly materially. If we do not have sufficient patent life to protect our products, our business and results of operations will be adversely affected.

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

We may be subject to claims that former employees, collaborators, or other third parties have an interest in our patents or other intellectual property as an inventor or co-inventor. The failure to name the proper inventors on a patent application can result in the patents issuing thereon being unenforceable. Inventorship disputes may arise from conflicting views regarding the contributions of different individuals named as inventors, the effects of foreign laws where foreign nationals are involved in the development of the subject matter of the patent, conflicting obligations of third parties involved in developing our product candidates or as a result of questions regarding co-ownership of potential joint inventions. For example, we may have inventorship disputes arise from conflicting obligations of consultants or others who are involved in developing our product candidates. Alternatively, or additionally, we may enter into agreements to clarify the scope of our rights in such intellectual property. Litigation may be necessary to defend against these and other claims challenging inventorship. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

We or our licensors may have relied on third-party consultants or collaborators or on funds from third parties, such as the U.S. government, such that we or our licensors are not the sole and exclusive owners of the patents we in-licensed. If other third parties have ownership rights or other rights to our patents, including in-licensed patents, they may be able to license such patents to our competitors, and our competitors could market competing products and technology. This could have a material adverse effect on our competitive position, business, financial conditions, results of operations, and prospects.

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

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

Our current or future trademarks or trade names may be challenged, infringed, circumvented or declared generic or descriptive, or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names or may be forced to stop using these names, which we need for name recognition by potential partners or customers in our markets of interest. During trademark registration proceedings, we may receive rejections of our applications by the USPTO or in other foreign jurisdictions. Although we would be given an opportunity to respond to those rejections, we may be unable to overcome such rejections. In addition, in the USPTO and in comparable agencies in many foreign jurisdictions, third parties are given an opportunity to oppose pending trademark applications and to seek to cancel registered trademarks. Opposition or cancellation proceedings may be filed against our trademarks, and our trademarks may not survive such proceedings. If we are unable to establish name recognition based on our trademarks and trade names, we may not be able to compete effectively and our business may be adversely affected. We may license our trademarks and trade names to third parties, such as distributors. Though these license agreements may provide guidelines for how our trademarks and trade names may be used, a breach of these agreements or misuse of our trademarks and tradenames by our licensees may jeopardize our rights in or diminish the goodwill associated with our trademarks and trade names.

Moreover, any name we have proposed to use with our product candidate in the United States must be approved by the FDA, regardless of whether we have registered it, or applied to register it, as a trademark. Similar requirements exist in Europe. The FDA typically conducts a review of proposed product names, including an evaluation of potential for confusion with other product names. If the FDA (or an equivalent administrative body in a foreign jurisdiction) objects to any of our proposed proprietary product names, it may be required to expend significant additional resources in an effort to identify a suitable substitute name that would qualify under applicable trademark laws, not infringe the existing rights of third parties and be acceptable to the FDA. Furthermore, in many countries, owning and maintaining a trademark registration may not provide an adequate defense against a subsequent infringement claim asserted by the owner of a senior trademark. At times, competitors or other third parties may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other registered trademarks or trademarks that incorporate variations of our registered or unregistered trademarks or trade names. If we assert trademark infringement claims, a court may determine that the marks we have asserted are invalid or unenforceable, or that the party against whom we have asserted trademark infringement has superior rights to the marks in question. In this case, we could ultimately be forced to cease use of such trademarks.

Risks Related to Ownership of Our Common Stock

Our stock price has experienced volatility and declines and may continue to be volatile or decline, regardless of our operating performance, resulting in substantial losses for investors.

The market price of our common stock has been and may continue to be highly volatile and may further decline substantially as a result of a variety of factors, some of which are related in complex ways. The market price of our common stock may fluctuate significantly in response to numerous factors, many of which are beyond our control, including the factors listed below and other factors described in this "Risk Factors" section of this Annual Report on Form 10-K:

- the commencement of, enrollment in, or results of current and future preclinical studies and clinical trials we may conduct, or changes in the development status of our product candidates;
- adverse results or delays in clinical trials;
- unanticipated serious safety concerns related to the use of our product candidates;
- any delay in our regulatory filings for our product candidates and any adverse development or perceived adverse development with respect to the applicable regulatory authority's review of such filings;
- changes in laws or regulations, including, but not limited to, preclinical study or clinical trial requirements for approvals;
- negative clinical outcomes or other adverse events related to product candidates being developed by others in the CNS field;
- publication of research reports about us or our industry, or CNS programs in particular, or positive or negative recommendations or withdrawal of research coverage by securities analysts;
- any adverse changes to our relationship with manufacturers or suppliers;
- manufacturing, supply or distribution shortages;
- our failure to commercialize our product candidates;

- general political conditions, including but not limited to, disruptions in U.S. government operations and funding, geopolitical conflicts such as the war between Russia and the Ukraine, the war between Israel and Hamas, and any sanctions or other repercussions that may result therefrom;
- general economic conditions, including but not limited to, inflation, tariffs, recession risk, low consumer confidence and interest rates;
- additions or departures of key scientific or management personnel;
- disputes or other developments relating to proprietary rights, including patents, litigation matters, and our ability to obtain patent protection for our technologies;
- variations in our results of operations;
- our cash position;
- our failure to meet the estimates and projections of the investment community or that we may otherwise provide to the public;
- announcements made by us or our competitors of new product and service offerings, acquisitions, strategic relationships, joint ventures, or capital commitments;
- our inability to establish collaborations, if needed;
- our ability to effectively manage our growth;
- changes in the market valuations of similar companies;
- press reports, whether or not true, about our business;
- sales or perceived potential sales of our common stock by us or our stockholders in the future;
- overall fluctuations in the equity markets;
- ineffectiveness of our internal controls;
- changes or developments in the global regulatory environment;
- litigation involving us, our industry or both, or investigations by regulators into our operations or those of our competitors;
- impact from the COVID-19 pandemic, or any future pandemic, on us or third parties with which we engage; and
- other events or factors, many of which are beyond our control.

In addition, the stock market in general and biotechnology and biopharmaceutical companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance, which may limit or prevent investors from selling their shares at or above the price paid for the shares and may otherwise negatively affect the liquidity of our common stock.

Our quarterly operating results may fluctuate significantly or may fall below the expectations of investors or securities analysts, each of which may cause our stock price to fluctuate or decline.

We expect our operating results to be subject to quarterly fluctuations, which will make it difficult for us to predict our future results. Our net loss and other operating results will be affected by numerous factors, including:

- timing and variations in the level of expense related to the current or future development of our programs, including but not limited to, the timing of the milestone payments;
- our ability to enroll patients in clinical trials and timing and status of enrollment for our clinical trials;
- results of clinical trials, or the addition or termination of, or changes to clinical trials or funding support by us or potential future partners;
- the need to conduct unanticipated clinical trials or trials that are larger or more complex than anticipated;
- competition from products that compete with our product candidates, and changes in the competitive landscape of our industry, including consolidation among our competitors or partners;
- any delays in regulatory review or approval of our product candidates;

- stock-based compensation estimates;
- changes in general political conditions, including but not limited to, disruptions in U.S. government operations and funding, geopolitical conflicts such as the war between Russia and the Ukraine, the war between Israel and Hamas, and any sanctions or other repercussions that may result therefrom;
- changes in general economic conditions, including but not limited to, inflation, tariffs, recession risk, low consumer confidence and interest rates;
- our execution of any collaboration, licensing or similar arrangements, and the timing of payments we may make or receive under potential future arrangements or the termination or modification of any such potential future arrangements;
- any intellectual property infringement, misappropriation or violation lawsuit or opposition, interference or cancellation proceeding in which we may become involved;
- additions and departures of key personnel;
- strategic decisions by us or our competitors, such as acquisitions, divestitures, spin-offs, joint ventures, strategic investments or changes in business strategy;
- if any product candidate we may develop receive regulatory approval, the timing and terms of such approval and market acceptance and demand for such product candidates;
- the timing and cost to establish a sales, marketing and distribution infrastructure to commercialize any products for which we may obtain marketing approval and intend to commercialize on our own or jointly with current or future collaborators;
- the risk/benefit profile, cost and reimbursement policies with respect to our product candidates, if approved, and existing and potential future products that compete with any of our product candidates;
- our ability to commercialize our product candidates, if approved, inside and outside of the United States, either independently or working with third parties;
- our ability to establish and maintain collaborations, licensing or other arrangements;
- our ability to adequately support future growth;
- potential unforeseen business disruptions that increase our costs or expenses;
- regulatory developments affecting current or future product candidates or those of our competitors; and
- impact from the COVID-19 pandemic, or any future pandemic, on us or third parties with which we engage.

If our quarterly operating results fall below the expectations of investors or securities analysts, the price of our common stock could decline substantially. Furthermore, any quarterly fluctuations in our operating results may, in turn, cause the price of our stock to fluctuate substantially. We believe that quarterly comparisons of our financial results are not necessarily meaningful and should not be relied upon as an indication of our future performance.

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

As of December 31, 2024, our executive officers, directors, holders of 5% or more of our capital stock and their respective affiliates owned approximately 48% of our outstanding voting stock. Therefore, these stockholders will have the ability to influence us through this ownership position. These stockholders may be able to determine all matters requiring stockholder approval. For example, these stockholders may be able to control elections of directors, amendments of our organizational documents, or approval of any merger, sale of assets, or other major corporate transaction. In addition, certain of our principal stockholders, including Amgen, ARCH Venture Partners and Mubadala Capital, have designated certain of our directors for election to our board of directors. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may feel are in your best interest as one of our stockholders.

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

If our existing stockholders sell, or indicate an intention to sell, or if the market perceives that such existing stockholders might sell, substantial amounts of our common stock in the public market, the market price of our common stock could decline. As of December 31, 2024, we had outstanding a total of 161,709,907 shares of common stock and approximately 48% of such shares were beneficially owned by our directors, officers, and holders of 5% or more of our common stock. In addition, approximately 38,591,940 shares of common stock that are either subject to outstanding options or reserved for future issuance under our employee benefit plans will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules and Rule 144 and Rule 701 under the Securities Act of 1933, as amended (Securities Act). If these additional shares of common stock are sold, or there is a perception that they will be sold, in the public market, the trading price of our common stock could decline. Further, certain holders of shares of our common stock are entitled to rights with respect to the registration of their shares under the Securities Act. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares held by affiliates, as defined in Rule 144 under the Securities Act. Any sales of securities by these stockholders could have a material adverse effect on the trading price of our common stock.

In addition, in the future, we may issue additional shares of common stock, or other equity or debt securities convertible into common stock, in connection with a financing, acquisition, employee arrangement, or otherwise. For example, in October 2024 we entered into a sales agreement with Leerink to sell shares of our common stock, from time to time, with aggregate gross sales proceeds of up to $300.0 million, through an ATM program with Leerink as the sales agent. During the year ended December 31, 2024, we received aggregate net proceeds of $13.7 million through sales of shares of our common stock under the ATM after deducting commissions and offering expenses of $0.8 million. In December 2023, we settled a Phase 3 navacaprant milestone owed to Blackthorn stockholders by primarily issuing shares of our common stock. Any such issuance could result in substantial dilution to our existing stockholders and could cause the price of our common stock to decline.

We do not currently intend to pay dividends on our common stock and, consequently, our stockholders' ability to achieve a return on their investment will depend on appreciation of the value of our common stock.

We have never declared or paid cash dividends on our common stock. We currently intend to retain all available funds and any future earnings to support operations and to finance the growth and development of our business. We do not intend to declare or pay any cash dividends on our capital stock in the foreseeable future. As a result, any investment return on our common stock will depend upon increases in the value for our common stock, which is not certain.

Provisions in our amended and restated certificate of incorporation and our amended and restated bylaws and Delaware law might discourage, delay or prevent a change in control of our company or changes in our management and, therefore, depress the market price of our common stock.

Our amended and restated certificate of incorporation and amended and restated bylaws contain provisions that could depress the market price of our common stock by acting to discourage, delay, or prevent a change in control of our company or changes in our management that the stockholders of our company may deem advantageous. These provisions, among other things:

- establish a staggered board of directors divided into three classes serving staggered three-year terms, such that not all members of the board of directors will be elected at one time;
- authorize our board of directors to issue new series of preferred stock without stockholder approval and create, subject to applicable law, a series of preferred stock with preferential rights to dividends or our assets upon liquidation, or with superior voting rights to our existing common stock;
- eliminate the ability of our stockholders to call special meetings of stockholders;
- eliminate the ability of our stockholders to fill vacancies on our board of directors;
- establish advance notice requirements for nominations for election to our board of directors or for proposing matters that can be acted upon by stockholders at our annual stockholder meetings;
- permit our board of directors to establish the number of directors;
- provide that our board of directors is expressly authorized to make, alter or repeal our amended and restated bylaws;
- provide that stockholders can remove directors only for cause and only upon the approval of not less than 66-2/3% of all outstanding shares of our voting stock;
- require the approval of not less than 66-2/3% of all outstanding shares of our voting stock to amend our amended and restated bylaws and specific provisions of our certificate of incorporation; and
- limit the forums in which certain stockholder litigation may be brought.

As a Delaware corporation, we are subject to the anti-takeover provisions of Section 203 of the Delaware General Corporation Law, which prohibits a Delaware corporation from engaging in a business combination specified in the statute with an interested stockholder (as defined in the statute) for a period of three years after the date of the transaction in which the person first becomes an interested stockholder, unless the business combination is approved in advance by a majority of the independent directors or by the holders of at least two-thirds of the outstanding disinterested shares. The application of Section 203 of the Delaware General Corporation Law could also have the effect of delaying or preventing a change of control of our company.

Our amended and restated certificate of incorporation provides an exclusive forum in the Court of Chancery of the State of Delaware for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the sole and exclusive forum, to the fullest extent permitted by law, for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a breach of a fiduciary duty owed by any director, officer or other employee to us or our stockholders, (3) any action asserting a claim against us or any director, officer, or other employee arising pursuant to the Delaware General Corporation Law, (4) any action to interpret, apply, enforce, or determine the validity of our second amended and restated certificate of incorporation or amended and restated bylaws or (5) any other action asserting a claim that is governed by the internal affairs doctrine, is the Court of Chancery of the State of Delaware (or another state court or the federal court located within the State of Delaware if the Court of Chancery does not have or declines to accept jurisdiction), in all cases subject to the court's having jurisdiction over indispensable parties named as defendants. In addition, our amended and restated certificate of incorporation provides that the federal district courts of the United States are the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act but that the forum selection provision does apply to claims brought to enforce a duty or liability created by the Exchange Act.

Although we believe these provisions benefit us by providing increased consistency in the application of Delaware law for the specified types of actions and proceedings, the provisions may result in increased costs to stockholders to bring a claim for any such dispute and may have the effect of discouraging lawsuits against us or our directors and officers. Alternatively, if a court were to find the choice of forum provision contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business, financial condition, and operating results. For example, under the Securities Act, federal courts have concurrent jurisdiction over all suits brought to enforce any duty or liability created by the Securities Act, and investors cannot waive compliance with the federal securities laws and the rules and regulations thereunder. Any person or entity purchasing or otherwise acquiring any interest in our shares of capital stock will be deemed to have notice of and consented to this exclusive forum provision, but will not be deemed to have waived our compliance with the federal securities laws and the rules and regulations thereunder.

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

Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended (the Code), if a corporation undergoes an "ownership change," generally defined as a greater than 50 percentage point change (by value) in its equity ownership by certain stockholders over a three-year period, the corporation's ability to use its pre-change net operating loss carryforwards (NOLs) and other pre-change tax attributes (such as research and development tax credits) to offset its post-change income or taxes may be limited. We may have experienced ownership changes in the past and may experience additional ownership changes in the future as a result of subsequent shifts in our stock ownership (some of which are outside our control). As a result, our ability to use our pre-change NOLs and tax credits to offset future taxable income, if any, could be subject to limitations. Similar provisions of state tax law may also apply. As a result, even if we attain profitability, we may be unable to use a material portion of our NOLs and tax credits.

General Risk Factors

If securities or industry analysts either do not publish research about us or publish inaccurate or unfavorable research about us, our business or our market, or if they change their recommendations regarding our common stock adversely, the trading price or trading volume of our common stock could decline.

The trading market for our common stock is influenced in part by the research and reports that securities or industry analysts may publish about us, our business, our market, or our competitors. If one or more of these analysts initiate research with an unfavorable rating or downgrade our common stock, provide a more favorable recommendation about our competitors or publish inaccurate or unfavorable research about our business, our common stock price would likely decline. If any analyst covering us were to cease coverage of us or fail to regularly publish reports on us, we could lose visibility in the financial markets, which in turn could cause the trading price or trading volume of our common stock to decline.

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

Global credit and financial markets have experienced extreme volatility and disruptions due to a number of factors including concerns about declines in consumer confidence, declines in economic growth, inflation, tariffs, borrowing rates and changes in liquidity and credit availability, and uncertainty about economic stability, including in connection with actions undertaken by the U.S. Federal Reserve Board to address inflation, the failure of banks, the military conflict in Ukraine, the war between Israel and Hamas and supply chain disruptions. There can be no assurance that future deterioration in global credit and financial markets and confidence in economic conditions will not occur. Our general business strategy may be adversely affected by any such economic downturn, volatile business environment or unpredictable and unstable market conditions. If the current equity and credit markets deteriorate, it may make any necessary debt or equity financing more difficult, more costly and more dilutive, if at all possible. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our growth strategy, financial performance and stock price and could require us to delay or abandon clinical development plans. In addition, there is a risk that one or more of our current service providers, manufacturers and other partners may not survive an economic downturn, which could directly affect our ability to attain our operating goals on schedule and on budget.

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

Prior to our initial public offering in September 2023, there was no public market for shares of our common stock. The price for our common stock may vary and an active or liquid market in our common stock may not be sustained. The lack of an active market may impair the value of your shares, your ability to sell your shares at the time you wish to sell them and the prices that you may obtain for your shares. An inactive market may also impair our ability to raise capital by selling our common stock and our ability to acquire other companies, products or technologies by using our common stock as consideration.

We were an emerging growth company and a smaller reporting company until December 31, 2024, and any decision on our part to comply only with certain reduced reporting and disclosure requirements applicable to emerging growth companies and smaller reporting companies could make our common stock less attractive to investors. The loss of emerging growth company and smaller reporting company status and compliance with additional disclosure requirements will increase our legal and financial compliance costs.

We were an "emerging growth company" as defined in the JOBS Act and a "smaller reporting company," as defined in the Exchange Act until December 31, 2024. Accordingly, we may choose to take advantage of exemptions from various reporting requirements applicable to other public companies but not to emerging growth companies or smaller reporting companies in this Annual Report on Form 10-K (including those sections incorporated by referenced to our Proxy Statement for our 2025 Annual Meeting of Stockholders),), including:

- reduced disclosure obligations regarding executive compensation in our periodic reports and annual report on Form 10-K; and
- exemptions from the requirements of holding non-binding advisory votes on executive compensation and stockholder approval of any golden parachute payments not previously approved.

The requirements of being a public company may strain our resources, result in more litigation, and divert management's attention.

We are subject to the reporting requirements of the Exchange Act, the Sarbanes-Oxley Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) the listing requirements of Nasdaq, and other applicable securities rules and regulations. Complying with these rules and regulations has increased and will increase our legal and financial compliance costs, make some activities more difficult, time consuming or costly and increase demand on our systems and resources. The Exchange Act requires, among other things, that we file annual, quarterly, and current reports with respect to our business and operating results. The Sarbanes-Oxley Act requires, among other things, that we maintain effective disclosure controls and procedures and internal control over financial reporting. We are required to disclose changes made in our internal control and procedures on a quarterly basis. In order to maintain and, if required, improve our disclosure controls and procedures and internal control over financial reporting to meet this standard, significant resources and management oversight may be required. As a result, management's attention may be diverted from other business concerns, which could adversely affect our business and operating results. We may also need to hire additional employees or engage outside consultants to comply with these requirements, which will increase our costs and expenses.

In addition, changing laws, regulations, and standards relating to corporate governance and public disclosure are creating uncertainty for public companies, increasing legal and financial compliance costs, and making some activities more time consuming. These laws, regulations, and standards are subject to varying interpretations, in many cases due to their lack of specificity and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices. We intend to invest resources to comply with evolving laws, regulations, and standards, and this investment may result in increased general and administrative expenses and a diversion of management's time and attention from revenue-generating activities to compliance activities. If our efforts to comply with new laws, regulations, and standards differ from the activities intended by regulatory or governing bodies, regulatory authorities may initiate legal proceedings against us and our business may be adversely affected.

These rules and regulations may make it more expensive for us to obtain director and officer liability insurance and, in the future, we may be required to accept reduced coverage or incur substantially higher costs to obtain coverage. These factors could also make it more difficult for us to attract and retain qualified members of our board of directors, particularly to serve on our audit committee and compensation committee, and qualified executive officers.

By disclosing information in filings required by us as a public company, our business and financial condition will continue to become more visible, which we believe may result in threatened or actual litigation, including by competitors and other third parties. If those claims are successful, our business could be seriously harmed. Even if the claims do not result in litigation or are resolved in our favor, the time and resources needed to resolve them could divert our management's resources and seriously harm our business.

Emerging growth companies are permitted to implement many of these requirements over time, however we are no longer an emerging growth company as of December 31, 2024 and expect to incur additional compliance-related expenses as a result.

Business disruptions could seriously harm our future revenue and financial condition and increase our costs and expenses.

Our operations could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or manmade disasters or business interruptions, for which we are predominantly self-insured. We rely on third-party manufacturers to produce our product candidates. Our ability to obtain clinical supplies of our product candidates could be disrupted if the operations of these suppliers were affected by a man-made or natural disaster or other business interruption. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses.

If we fail to maintain proper and effective internal controls over financial reporting our ability to produce accurate and timely financial statements could be impaired.

Pursuant to Section 404 of the Sarbanes-Oxley Act, our management is required to report upon the effectiveness of our internal control over financial reporting and beginning with this Annual Report on Form 10-K, we are required to have an independent registered public accounting firm attest to the effectiveness of our internal control over financial reporting. The rules governing the standards that must be met for management to assess our internal control over financial reporting are complex, judgmental and require significant documentation, testing and possible remediation. To comply with the requirements of being a reporting company under the Exchange Act, we will need to implement additional financial and management controls, reporting systems and procedures and hire additional accounting and finance staff.

We cannot assure you that there will not be material weaknesses or significant deficiencies in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition, results of operations, or cash flows. If we are unable to conclude that our internal control over financial reporting is effective, or if we and/or our independent registered public accounting firm determines we have a material weakness or significant deficiency in our internal control over financial reporting, investors may lose confidence in the accuracy and completeness of our consolidated financial statements, the market price of our common stock could decline, and we could be subject to sanctions or investigations by Nasdaq, the SEC, or other regulatory authorities. Failure to remedy any material weakness in our internal control over financial reporting, or to implement or maintain other effective control systems required of public companies, could also restrict our future access to the capital markets.

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

We are subject to the periodic reporting requirements of the Exchange Act. We must design our disclosure controls and procedures to reasonably assure that information we must disclose in reports we file or submit under the Exchange Act is accumulated and communicated to management, and recorded, processed, summarized, and reported within the time periods specified in the rules and forms of the SEC. We believe that any disclosure controls and procedures or internal controls and procedures, no matter how well-conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. For example, our directors or executive officers could inadvertently fail to disclose a new relationship or arrangement causing us to fail to make a required related party transaction disclosure. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls. Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected.

If our estimates or judgments relating to our critical accounting policies prove to be incorrect or financial reporting standards or interpretations change, our results of operations could be adversely affected.

The preparation of financial statements in conformity with generally accepted accounting principles in the United States (U.S. GAAP), requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. We base our estimates on historical experience, known trends and events, and various other factors that we believe to be reasonable under the circumstances, as provided in "Management's Discussion and Analysis of Financial Condition and Results of Operations—Critical Accounting Policies and Estimates." The results of these estimates form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Significant assumptions and estimates used in preparing our consolidated financial statements include but are not limited to stock-based compensation and evaluation of acquisitions of assets and other similar transactions as well as clinical trial accruals. Our results of operations may be adversely affected if our assumptions change or if actual circumstances differ from those in our assumptions, which could cause our results of operations to fall below the expectations of securities analysts and investors, resulting in a decline in the trading price of our common stock.

Additionally, we regularly monitor our compliance with applicable financial reporting standards and review new pronouncements and drafts thereof that are relevant to us. As a result of new standards, changes to existing standards and changes in their interpretation, we might be required to change our accounting policies, alter our operational policies, and implement new or enhance existing systems so that they reflect new or amended financial reporting standards, or we may be required to restate our audited consolidated financial statements, unaudited condensed consolidated financial statements and related notes. Such changes to existing standards or changes in their interpretation may also have an adverse effect on our reputation, business, financial condition, and results of operations.

Our information technology systems, or those used by our third-party research institution collaborators, CROs, CMOs, or other contractors or consultants, may fail or suffer cyberattacks or security breaches.

We are increasingly dependent upon information technology systems, infrastructure and data to operate our business. In the ordinary course of business, we collect, store and transmit confidential information (including but not limited to intellectual property, proprietary business information, clinical trial data, and personal information of our employees and contractors). It is critical that we do so in a secure manner to maintain the confidentiality and integrity of such confidential information. We also have outsourced elements of our operations to third parties, and as a result we manage a number of third-party contractors who have access to our confidential information.

Despite the implementation of security measures, our information technology systems and those of our CROs, CMOs, and other contractors and consultants are vulnerable to attack, damage, or interruption from hacking, cyberattacks, "phishing" attacks and other social engineering schemes, computer viruses and malware (e.g., ransomware), malicious code, denial or degradation of service attacks, sophisticated nation-state and nation-state supported actors, unauthorized access or use by persons within our organization, natural disasters, terrorism, war and telecommunication and electrical failures, employee theft or misuse, human error, and fraud. Attacks upon information technology systems are increasing in their frequency, levels of persistence, sophistication and intensity, and are being conducted by sophisticated and organized groups and individuals with a wide range of motives and expertise. As a result of the continued hybrid working environment, we also face increased cybersecurity risks due to our reliance on internet technology and the number of our employees who are working remotely, which may create additional opportunities for cybercriminals to exploit vulnerabilities.

We and certain of our service providers are from time to time subject to cyberattacks and security incidents, including social engineering and phishing attacks. Furthermore, because the techniques used to obtain unauthorized access to, or to sabotage, systems change frequently and often are not recognized until launched against a target, we may be unable to anticipate these techniques or implement adequate preventative measures. We may also experience security breaches that may remain undetected for an extended period. Even if identified, we may be unable to adequately investigate or remediate incidents or breaches due to attackers increasingly using tools and techniques that are designed to circumvent controls, to avoid detection, and to remove or obfuscate forensic evidence. Although to our knowledge we have not experienced any such material system failure, accident, or security breach to date, if such an event were to occur and negatively affect, our operations, it could result in a material disruption of our development programs and our business operations. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. Further, we cannot ensure that our data protection efforts and our investment in information technology will prevent significant breakdowns, data leakages, breaches in our systems or other cyber incidents that could have a material adverse effect upon our reputation, business, operations or financial condition.

Likewise, we rely on our third-party research institution collaborators for research and development of our product candidates and other third parties for the manufacture of our product candidates and to conduct clinical trials, and similar events relating to their information technology systems could also have a material adverse effect on our business. To the extent that any disruption or security incident were to result in an actual or perceived loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information or patient information, we could incur liability and the further development and commercialization of our product candidates could be delayed. Furthermore, significant disruptions of our internal information technology systems or security breaches could result in the loss, misappropriation, and/or unauthorized access, use, or disclosure of, or the prevention of access to, confidential information (including trade secrets or other intellectual property, proprietary business information, and personal information), which could result in financial, legal, business, and reputational harm to us. For example, any such event that leads to unauthorized access, use, or disclosure of personal information, including personal information regarding our clinical trial subjects or employees, could harm our reputation directly, compel us to comply with federal and/or state breach notification laws and foreign law equivalents, subject us to mandatory corrective action, and otherwise subject us to liability under laws and regulations that protect the privacy and security of personal information, which could result in significant legal and financial exposure and reputational damages that could potentially have an adverse effect on our business. Further, our insurance coverage may not be sufficient to cover the financial, legal, business or reputational losses that may result from an interruption or breach of our systems.

We have entered and expect to enter into collaboration, license, contract research and/or manufacturing relationships with organizations that operate in certain countries that are at heightened risk of theft of technology, data and intellectual property through direct intrusion by private parties or foreign actors, including those affiliated with or controlled by state actors. Accordingly, our efforts to protect and enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license, and we may be at heightened risk of losing our proprietary intellectual property rights around the world, including outside of such countries, to the extent such theft or intrusion destroy the proprietary nature of our intellectual property.

We may be subject to claims that our employees, consultants, or independent contractors have wrongfully used or disclosed confidential information of third parties.

We have received confidential and proprietary information from third parties. In addition, we employ individuals who were previously employed at other biotechnology or biopharmaceutical companies. Although we try to ensure that individuals working for or collaborating with us do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants, or independent contractors have inadvertently or otherwise used or disclosed confidential information proprietary to these third parties or our employees' former employers, or that we caused an employee to breach the terms of his or her non-competition or non-solicitation agreement. We may be subject to claims that patents and applications we have filed to protect inventions of our employees, consultants, advisors or other third parties, including those related to one or more of our product candidates, are rightfully owned by their former or concurrent employer. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial cost and be a distraction to our management and employees. If our defenses to these claims fail, in addition to requiring us to pay monetary damages, a court could prohibit us from using technologies or features that are essential to our product candidates, if such technologies or features are found to incorporate or be derived from the trade secrets or other proprietary information of the former employers. Moreover, any such litigation or the threat thereof may adversely affect our reputation, our ability to form strategic alliances or sublicense our rights to collaborators, engage with scientific advisors or hire employees or consultants, each of which would have an adverse effect on our business, results of operations and financial condition. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management.

We are currently subject to and may be subject to additional future securities class action litigation.

Securities class action litigation has often been instituted against companies following periods of volatility in the market price of a company's securities. For example, on February 6, 2025, a purported stockholder of the Company filed a lawsuit against us, certain of our executive officers, and certain underwriters in the United States District Court for the Southern District of New York alleging violations of the Securities Act related to our initial public offering. See the section titled "Legal Proceedings" in this Annual Report on Form 10-K for additional information regarding this matter. This litigation could result in substantial costs and a diversion of management's attention and resources, which would harm our business, results of operations, or financial condition. Additionally, the dramatic increase in the cost of directors' and officers' liability insurance may cause us to opt for lower overall policy limits or to forgo insurance that we may otherwise rely on to cover significant defense costs, settlements, and damages awarded to plaintiff.

ITEM 1B. Unresolved Staff Comments.

None.

ITEM 1C. Cybersecurity.

Management of Cybersecurity Risks and Cybersecurity Strategy

We have developed and implemented a cybersecurity program intended to protect the confidentiality, integrity, and availability of our critical systems and information.

We design and assess our program based on the National Institute of Standards and Technology Cybersecurity Framework (NIST CSF). This does not imply that we meet any particular technical standards, specifications, or requirements, only that we use the NIST CSF as a guide to help us identify, assess, and manage cybersecurity risks relevant to our business.

Our cybersecurity program shares common methodologies, reporting channels and governance processes as the risk management programs of other departments within our company, including the legal, compliance, strategic, operational, and financial departments.

Key elements of our cybersecurity program includes but are not limited to the following:

- risk assessments designed to help identify material risks from cybersecurity threats to our critical systems and information;
- a security team principally responsible for managing (i) our cybersecurity risk assessment processes, (ii) our security controls, and (iii) our response to cybersecurity incidents;
- the use of external service providers, where appropriate, to assess, test or otherwise assist with aspects of our security processes;
- cybersecurity awareness training of our employees, including incident response personnel, and senior management;
- a cybersecurity incident response plan that includes procedures for responding to cybersecurity incidents; and
- ad hoc internal review of the cybersecurity practices of key service providers, suppliers, and vendors who have access to our critical systems and information based on our assessment of their criticality to our operations and respective risk profile.

We have not identified risks from known cybersecurity threats, including as a result of any prior cybersecurity incidents, that have materially affected us, including our operations, business strategy, results of operations, or financial condition. We face risks from cybersecurity threats that, if realized are reasonably likely to materially affect us, including our operations, business strategy, results of operations, or financial condition. For more information, see the section titled "Risk Factors— Our information technology systems, or those used by our third-party research institution collaborators, CROs, CMOs, or other contractors or consultants, may fail or suffer cyberattacks or security breaches."

Cybersecurity Governance

Our board of directors considers cybersecurity risk as part of its risk oversight function and has delegated to the Audit Committee (the "Committee") oversight of cybersecurity risks, including oversight of management's implementation of our cybersecurity program.

The Committee receives annual reports from management on our cybersecurity risks. In addition, management updates the Committee, as necessary, regarding any material cybersecurity incidents, as well as any incidents with lesser impact potential.

The Committee reports to the full board of directors regarding its activities, including those related to cybersecurity. The full board of directors also receives briefings from management on our cybersecurity program. Board members receive presentations on cybersecurity topics from our Senior Director of Infrastructure and Cybersecurity, internal security staff or external experts as part of the board of directors' continuing education on topics that impact public companies.

Our management team, including our Senior Director of Infrastructure and Cybersecurity (20 years of cybersecurity risk management experience) and Chief Information Officer (five years of cybersecurity risk management experience), is responsible for assessing and managing our material risks from cybersecurity threats. The team has primary responsibility for our overall cybersecurity program and supervises both our internal cybersecurity personnel and our retained external cybersecurity consultants. Our management team's experience includes demonstrated expertise in cybersecurity, life sciences, and security industry certifications such as Certified Information Security Manager (CISM) and Certified Information Systems Security Professional (CISSP).

Our management team takes steps to stay informed about and monitor supervises efforts to prevent, detect, mitigate and remediate cybersecurity risks and incidents through various means, which may include briefings from internal security personnel; threat intelligence and other information obtained from governmental, public or private sources, including external consultants engaged by us; and alerts and reports produced by security tools deployed in the information technology environment.

ITEM 2. Properties.

Our corporate headquarters are located in Watertown, Massachusetts, where we sublease approximately 31,000 square feet of office and laboratory space pursuant to a sublease agreement that expires in June 2025.

ITEM 3. Legal Proceedings.

On February 6, 2025, a purported stockholder of the Company filed a lawsuit against us, certain executive officers, and certain underwriters in the United States District Court for the Southern District of New York (Case No. 1:25-cv-01072). The complaint is a putative class action alleging violations of the Securities Act related to our initial public offering on September 15, 2023. The plaintiff seeks compensatory damages, as well as fees and costs. The complaint claims that our offering documents contained false and misleading statements and omitted material facts about the prospects of navacaprant. We do not believe these allegations have merit and intend to move to dismiss.

In addition, from time to time, we may in the ordinary course of business become involved in legal proceedings. Regardless of outcome, litigation could have a material adverse effect on our business results of operations or financial condition due to defense and settlement costs, diversion of management resources, negative publicity, reputational harm and other factors, and there can be no assurances that favorable outcomes will be obtained.

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

Our Common stock trades under the symbol "NMRA" on the Nasdaq Global Select Market and began trading on September 15, 2023. Prior to that date, there was no public trading market for our common stock.

Holders of Our Common Stock

As of February 24, 2025, there were approximately 83 holders of record of shares of our common stock. The actual number of stockholders is greater than this number of record holders, and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees.

Dividend Policy

We have never declared or paid, and do not anticipate declaring or paying in the foreseeable future, any cash dividends on our capital stock. We currently intend to retain all available funds and any future earnings to support our operations and finance the growth and development of our business. Any future determination related to our dividend policy will be made at the discretion of our board of directors and will depend upon, among other factors, our results of operations, financial condition, capital requirements, contractual restrictions, business prospects and other factors our board of directors may deem relevant.

Securities Authorized for Issuance under Equity Compensation Plans

The information required by this item is incorporated by reference to the definitive Proxy Statement for our 2025 Annual Meeting of Stockholders, which will be filed with the SEC no later than 120 days after December 31, 2024.

Recent Sales of Unregistered Equity Securities

None.

Use of Proceeds from our Public Offering of Common Stock

On September 19, 2023, our registration statement on Form S-1 (File No. 333- 274229) relating to our IPO of common stock became effective.

There has been no material change in the planned use of proceeds from the IPO from that described in the prospectus filed with the SEC pursuant to Rule 424(b)(4) under the Securities Act on September 18, 2023.

Issuer Purchases of Equity Securities

None.

ITEM 6. Reserved.

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

The following discussion and analysis of our financial condition and results of operations should be read together with the consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K. This discussion and analysis contains forward-looking statements based upon current beliefs, plans, and expectations related to future events and our future performance that involves risks, uncertainties, and assumptions, such as statements regarding our intentions, plans, objectives, and expectations for our business. Our actual results and the timing of selected events could differ materially from those discussed in the forward-looking statements as a result of several factors including those set forth in the section titled "Risk Factors." See also the section titled "Special Note Regarding Forward-Looking Statements".

Overview

We are a clinical-stage biopharmaceutical company founded to confront the global brain disease crisis by taking a fundamentally different approach to the way treatments for brain diseases are developed. We have rapidly scaled our therapeutic pipeline, which currently consists of seven neuroscience programs, including two clinical programs, that target novel mechanisms of action for a broad range of underserved neuropsychiatric disorders and neurodegenerative diseases. Our most advanced product candidate, navacaprant (NMRA-140), is a novel once-daily oral kappa opioid receptor (KOR) antagonist that is being developed for the treatment of major depressive disorder (MDD), which we believe has the potential to provide significant advantages relative to the standard of care, if approved. Navacaprant is being investigated in the KOASTAL program, a pivotal Phase 3 program, evaluating navacaprant monotherapy in patients with moderate to severe MDD. Neumora expects to report topline data from KOASTAL-3 in the first quarter of 2026 and KOASTAL-2 in the second quarter of 2026. Our next most advanced product candidate is NMRA-511, a highly selective, novel antagonist of the vasopressin 1a receptor (V1aR) being developed for the treatment of agitation associated with dementia due to Alzheimer's disease (AD). We are advancing a Phase 1b signal-seeking study investigating NMRA-511 initially in healthy elderly adult participants and then people with agitation associated with dementia due to AD, and we expect to report data from this study in by the end of 2025. Our M4 positive allosteric modular (PAM) franchise comprises multiple novel compounds that each have different chemical composition but optimal pharmacological properties, which have demonstrated robust activity in preclinical efficacy models and high selectivity for the M4 receptor subtype. We expect to progress our next M4 PAM into the clinic by mid-2025.

We were incorporated in November 2019 and commenced operations thereafter. To date, we have focused primarily on building our organization, acquiring technologies and companies, developing our precision neuroscience approach, identifying and developing potential product candidates, executing clinical and preclinical studies, organizing and staffing our company, business planning, establishing our intellectual property portfolio, raising capital and providing general and administrative support for these operations. We do not have any products approved for sale, we have not generated any revenue from the sale of products, and we do not expect to generate revenue from the sale of our product candidates until we complete clinical development, submit regulatory filings, and receive approvals from the applicable regulatory bodies for such product candidates, if ever.

In September 2023, we completed our initial public offering (IPO) pursuant to which we issued and sold an aggregate of 14,710,000 shares of our common stock at a price to the public of $17.00 per share. We received aggregate net proceeds of $226.5 million after deducting underwriting discounts and commissions of $17.5 million and other offering expenses of $6.0 million. Since our IPO, in October 2024 we entered into a sales agreement with Leerink Partners LLC (Leerink) to sell shares of our common stock, from time to time, with aggregate gross sales proceeds of up to $300.0 million, through an at-the-market equity offering program (ATM) with Leerink as the sales agent. During the year ended December 31, 2024, we received aggregate net proceeds of $13.7 million after deducting commissions and offering expenses of $0.8 million. As of December 31, 2024, we had $307.6 million in cash, cash equivalents and marketable securities. Based upon our current operating plan, we believe that our existing cash, cash equivalents and marketable securities, will enable us to fund our operating expenses and capital expenditure requirements through at least the next 12 months following the issuance of the consolidated financial statements.

Since our inception, we have incurred significant operating losses and we expect to continue to incur significant losses for the foreseeable future as we continue to advance the development of our product candidates and approach, and incur additional costs associated with being a public company. Our net losses were $243.8 million, $235.9 million, $130.9 million for the years ended December 31, 2024, 2023, and 2022, respectively. As of December 31, 2024, we had an accumulated deficit of $947.2 million. Our primary use of our capital resources is to fund our operating expenses, which consist primarily of expenditures related to identifying, acquiring, developing, and in-licensing our precision neuroscience approach and product candidates, and conducting preclinical studies and clinical trials, and to a lesser extent, general and administrative expenditures. Our net losses may fluctuate significantly from period to period, depending on the timing of our clinical trials and our expenditures on research and development activities.

We will need substantial additional funding to support our continuing operations and pursue our long-term business plan, including to complete the development and commercialization of our product candidates, if approved. Until such time as we can generate significant revenue from sales of our product candidates, if ever, we expect to finance our operations through public or private equity offerings or debt financings or other capital sources, which may include strategic collaborations or other arrangements with third parties, or other sources of financing. We may not be able to raise additional capital on terms acceptable to us or at all. If we are unable to raise additional capital on acceptable terms when needed, our business, results of operations, and financial condition would be adversely affected. The amount and timing of our future funding requirements will depend on many factors including the successful advancement of our precision neuroscience approach, programs, and product candidates. Our ability to raise additional funds may also be adversely impacted by potential worsening global economic conditions and disruptions to, and volatility in, the credit and financial markets in the United States and worldwide.

Acquisitions of Assets

We have completed various acquisitions. For details regarding our acquisitions, see Note 6 – Acquisitions of Assets to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Strategic License and Research and Collaboration Agreements

We have assumed license arrangements with certain third parties as a result of our acquisitions and have entered into several additional agreements with various parties. For details regarding these agreements, see Note 8 –Strategic License and Research and Collaboration Agreements to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Contingent Consideration

BlackThorn Contingent Consideration

Pursuant to the terms of the BlackThorn Merger Agreement, we are required to pay the former stockholders of BlackThorn contingent consideration (i) with respect to navacaprant, in the form of development and regulatory approval milestones of up to an aggregate amount of $365.0 million, which includes a milestone payment that became due and was paid in the fourth quarter of 2023 upon dosing the first patient in the Phase 3 clinical trial for navacaprant, and sales-based milestones of up to an aggregate amount of $450.0 million and (ii) with respect to NMRA-511, in the form of development and regulatory approval milestones of up to an aggregate amount of $100.0 million, and sales-based milestones of up to an aggregate amount of $100.0 million (BlackThorn Milestones). At the Company's sole discretion, the BlackThorn Milestone payments may be settled in cash or shares of the Company, or a combination of both, subject to the provisions of the BlackThorn Merger Agreement, other than one development milestone in the amount of $10.0 million, which must be settled in cash. In December 2023, we issued 6,072,445 shares of common stock based on the volume weighted average price per share prior to the date the milestone was met and paid $2.3 million in cash in satisfaction of the Phase 3 navacaprant milestone to the former stockholders of BlackThorn and participants in the carveout plan. As of December 31, 2024, none of the other BlackThorn Milestones have been achieved and no such related amounts were deemed due or payable.

Vanderbilt Contingent Consideration

Pursuant to the terms of the Vanderbilt License Agreement, we are required to pay Vanderbilt contingent consideration payable in cash up to an aggregate of $42.4 million upon the achievement of specified development milestones and up to an aggregate of $380.0 million upon the achievement of commercial milestone events as well as tiered royalties at mid-single digit percentages on potential future net sales. We achieved a $2.0 million development milestone in October 2023, which was paid in cash in November 2023. As of December 31, 2024, none of the other Vanderbilt milestones have been achieved and no such related amounts were deemed due or payable.

Components of Operating Results

Operating Expenses

Research and Development

Research and development expenses consist of external and internal expenses, and primarily relate to our discovery efforts and development of our precision neuroscience approach, programs, and product candidates. We account for acquired in-process research and development (IPR&D) expenses from our strategic acquisitions, which accounted for a significant portion of our operating expenses during the years ended December 31, 2023 and 2022, separately from research and development expenses. There was no IPR&D expense recognized during the year ended December 31, 2024.

External research and development expenses include, among others, amounts incurred with contract research organizations (CROs), contract manufacturing organizations (CMOs), preclinical testing organizations and other vendors that conduct research and development activities on our behalf. Internal research and development expenses include, among others, personnel-related costs, including salaries, benefits and stock-based compensation for employees engaged in research and development functions, laboratory supplies and other non-capital equipment utilized for in-house research, software development costs and allocated expenses including facilities costs and depreciation and amortization.

Because we are working on multiple research and development programs at any one time, we track our external expenses by the stage of program, clinical or preclinical. However, our internal expenses, including unallocated costs, employees and infrastructure are not directly tied to any one program and are deployed across multiple programs. As such, we do not track internal expenses on a specific program basis.

We expense research and development costs as incurred. Amounts recorded for external goods or services incurred for research and development activities that have not yet been invoiced are included in accrued liabilities in our consolidated balance sheets and often represent estimates. We estimate accrued expenses and the related research and development expense based on the level of services performed but not yet invoiced pursuant to agreements established with our service providers, according to the progress of preclinical studies, clinical trials or related activities, and discussions with applicable personnel and service providers as to the progress or state of consummation of goods and service. 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 consolidated financial statements as prepaid expenses or other current assets or accrued liabilities. Nonrefundable advance payments that we make for goods or services to be received in the future for use in research and development activities are recorded as prepaid expenses. Such amounts are recognized as an expense as the goods are delivered or the related services are performed, or until it is no longer expected that the goods will be delivered, or the services rendered.

We expect to continue to incur significant research and development expenses for the foreseeable future as we further develop our precision neuroscience approach and advance our programs and product candidates through clinical development and pursue regulatory approval of our product candidates. The process of conducting the necessary clinical and preclinical research to obtain regulatory approval is costly and time-consuming, and the successful development of our product candidates is highly uncertain. As a result of the uncertainties discussed below, we are unable to determine the duration and completion costs of our research and development projects or when and to what extent we will generate revenue from the commercialization and sale of our product candidates.

Our research and development expenses may vary significantly based on factors such as:

- per patient trial costs;
- the number of trials required for approval;
- the number of sites included in the trials;
- change to trials;
- the countries in which the trials are conducted;
- the length of time required to enroll eligible patients;
- the number of patients that participate in the trials;
- the drop-out or discontinuation rates of patients;
- potential additional safety monitoring requested by regulatory agencies;
- the duration of patient participation in the trials and follow-up;
- the cost and timing of manufacturing our product candidates;
- the phase of development of our product candidates;
- the efficacy and safety profile of our product candidates;
- the number and scope of preclinical and IND-enabling studies;
- the effectiveness of our precision neuroscience approach at identifying target patient populations and utilizing the approach to enrich our patient population in our clinical trials;

- employee-related costs for personnel engaged in the design, development, testing and enhancement of our precision neuroscience related technology;
- the extent to which we establish additional collaboration or license agreements;
- whether we choose to partner any of our product candidates and the terms of such partnership; and
- the impact of general economic conditions, such as inflation. tariffs, and interest rates.

A change in the outcome of any of these variables with respect to the development of any of our product candidates could significantly change the costs and timing associated with the development of that product candidate. We may never succeed in obtaining regulatory approval for any of our product candidates. We may obtain unexpected results from our preclinical studies and future clinical trials.

Acquired In-Process Research and Development

Acquired in-process research and development expenses consist of existing research and development projects at the time of the acquisition. Projects that qualify as IPR&D assets represent those that have not yet reached technological feasibility and have no alternative future use. Our acquisitions of assets have all included IPR&D assets that had not yet reached technological feasibility and had no alternative future use, which resulted in a write-off of these IPR&D assets to acquired in-process research and development expenses in our consolidated statement of operations and comprehensive loss.

General and Administrative

General and administrative expenses include, among others, personnel-related costs, including salaries, benefits, and stock-based compensation for our employees in executive, finance, and other administrative functions, legal fees, professional fees incurred for accounting, audit, and tax services, recruiting costs, and other allocated expenses, including facilities costs and depreciation and amortization not included in research and development expenses. Legal fees are included within general and administrative expenses and are related to corporate and intellectual property related matters.

We expect our general and administrative expenses to increase substantially in the foreseeable future as we continue to support our research and development activities, grow our business and, if any of our product candidates receive marketing approval, commence commercialization activities. We will also continue to incur additional expenses associated with operating as a public company, including increased expenses related to audit, legal, regulatory, and tax-related services associated with maintaining compliance with the rules and regulations of the SEC and standards applicable to public companies, additional insurance expenses, investor relations activities and other administrative and professional services.

Other Income (Expense)

Interest Income

Interest income consists of interest earned on our cash equivalents and marketable securities.

Results of Operations

For the Years Ended December 31, 2024 and 2023

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

	Year Ended December 31,			2024 vs 2023	2023 vs 2022
	2024	2023	2022	$ Change	$ Change
	(in thousands)				
Operating expenses:					
Research and development	$ 200,927	$ 142,719	$ 91,749	$ 58,208	$ 50,970
General and administrative	62,537	45,475	31,121	17,062	14,354
Acquired in-process research and development	—	63,904	13,000	(63,904)	50,904
Total operating expenses	263,464	252,098	135,870	11,366	116,228
Loss from operations	(263,464)	(252,098)	(135,870)	(11,366)	(116,228)
Other income (expense):					
Interest income	19,933	16,611	4,561	3,322	12,050
Other income (expense), net	(78)	(170)	405	92	(575)
Total other income	19,855	16,441	4,966	3,414	11,475
Net loss before income taxes	(243,609)	(235,657)	(130,904)	(7,952)	(104,753)
Provision for income taxes	178	268	—	(90)	268
Net loss	$ (243,787)	$ (235,925)	$ (130,904)	$ (7,862)	$ (105,021)

For discussion of our 2023 results and a comparison with 2022 results please refer to "Management's Discussion and Analysis of Financial Conditions and Results of Operations" in our Annual Report on Form 10-K for the fiscal year ended December 31, 2023 that was filed with the SEC on March 7, 2024.

Research and Development Expenses

The following table summarizes our research and development expenses by program for the periods presented:

	Year Ended December 31,			2024 vs 2023	2023 vs 2022
	2024	2023	2022	$ Change	$ Change
	(in thousands)				
Direct external program expenses:					
Navacaprant (NMRA-140) program	$ 105,442	$ 37,929	$ 9,685	$ 67,513	$ 28,244
M4 PAM programs	11,041	11,507	4,601	(466)	6,906
NMRA-511 program	7,236	6,588	860	648	5,728
Preclinical programs	5,776	10,622	11,597	(4,846)	(975)
Internal and unallocated expenses:					
Personnel-related costs	47,036	36,789	27,445	10,247	9,344
Other costs	24,396	39,284	37,561	(14,888)	1,723
Total research and development expenses	$ 200,927	$ 142,719	$ 91,749	$ 58,208	$ 50,970

Research and development expenses increased by $58.2 million, or 41%, to $200.9 million for the year ended December 31, 2024 from $142.7 million for the year ended December 31, 2023 as we advanced our clinical trials. Direct external program expenses increased by $62.8 million, of which $67.5 million was related to the advancement our Phase 3 and Phase 2 clinical trials for navacaprant, partially offset by a decrease of $4.8 million to preclinical program research. Internal and unallocated expenses decreased by $4.6 million, primarily attributable to decreased activities under our research and collaboration agreements with Amgen and with other vendors, which was partially offset by an increase in personnel related costs of $10.2 million, including $9.6 million related to stock-based compensation. Stock-based compensation primarily increased due to stock modification expense of $4.1 million and the increased value of stock awards issued.

Acquired In-Process Research and Development Expenses

Acquired in-process research and development expenses decreased to nil for the year ended December 31, 2024 from $63.9 million for the year ended December 31, 2023. For the year ended December 31, 2023, acquired in-process research and development expenses consisted of $61.1 million related to achievement of the Phase 3 navacaprant development milestone and $2.8 million related to our in-license from Vanderbilt, as these assets had not yet reached technological feasibility and had no alternative future use.

General and Administrative Expenses

General and administrative (G&A) expenses increased by $17.1 million, or 38%, to $62.5 million for the year ended December 31, 2024 from $45.5 million for the year ended December 31, 2023. The increase was primarily attributable to higher personnel-related costs, including $13.2 million related to stock-based compensation due to the increased value of stock awards issued, a $2.6 million increase in professional services for legal, accounting and advisory services, a $1.0 million increase in business insurance, and a $1.0 million increase in facilities cost due to a higher allocation of G&A costs.

Interest Income

Interest income increased by $3.3 million to $19.9 million for the year ended December 31, 2024 from $16.6 million for the year ended December 31, 2023, which was attributable to interest earned on our higher balances in cash equivalents and marketable securities.

Liquidity and Capital Resources

Sources of Liquidity

As of December 31, 2024, we had $307.6 million of cash, cash equivalents and marketable securities. Prior to our IPO we primarily funded our operations with the net proceeds from the sale and issuance of our convertible preferred stock and convertible promissory notes and raised gross cash proceeds of over $600 million including from the sale of convertible preferred stock, borrowings pursuant to convertible promissory notes and cash acquired in our acquisitions of assets. In September, 2023, we completed our IPO pursuant to which we issued and sold an aggregate of 14,710,000 shares of common stock at a price to the public of $17.00 per share. We received aggregate net proceeds of $226.5 million after deducting underwriting discounts and commissions of $17.5 million and other offering expenses of $6.0 million. Since our IPO, in October 2024 we entered into a sales agreement with Leerink to sell shares of our common stock, from time to time, with aggregate gross sales proceeds of up to $300.0 million, through an ATM with Leerink as the sales agent. We received aggregate net proceeds of $13.7 million after deducting commissions and offering expenses of $0.8 million during the three months ended December 31, 2024.

Since our inception, we have not generated any revenue from the sale of products and we have incurred significant net losses and negative cash flows from operations. Our primary use of our capital resources is to fund our operating expenses, which consist primarily of expenditures related to identifying, acquiring, developing, and in-licensing our precision neuroscience approach, programs, and product candidates, and conducting preclinical studies and clinical trials, and to a lesser extent, general and administrative expenditures. We have not yet commercialized any products and we do not expect to generate revenue from sales of any product candidates for a number of years, if ever. As of December 31, 2024, we had an accumulated deficit of $947.2 million.

Future Funding Requirements

We expect our expenses and operating losses will increase substantially over the foreseeable future as we continue our research and development efforts, advance our product candidates through clinical and preclinical development, enhance our precision neuroscience approach and programs, expand our product pipeline, seek regulatory approval, prepare for commercialization, as well as hire additional personnel and protect our intellectual property. Furthermore, we have incurred and will continue to incur additional costs associated with being a public company. We also expect to increase the size of our administrative function to support the growth of our business. Our net losses may fluctuate significantly from period to period, depending on the factors described below. We are subject to the risks typically related to the development of new products, and we may encounter unforeseen expenses, difficulties, complications, delays, and other unknown factors that may adversely affect our business. The expected increase in expenses will be driven in large part by our ongoing activities, and our future capital requirements will depend on many factors, including:

- the scope, timing, progress, costs and results of discovery, preclinical development and clinical trials for our current or future product candidates;
- the number of clinical trials required for regulatory approval of our current or future product candidates;
- the costs, timing and outcome of regulatory review of any of our current or future product candidates;

- the costs associated with acquiring or licensing additional product candidates, technologies or assets, including the timing and amount of any milestones, royalties or other payments due in connection with our acquisitions and licenses;
- the cost of manufacturing clinical and commercial supplies of our current or future product candidates;
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims, including any claims by third parties that we are infringing upon their intellectual property rights;
- the effectiveness of our precision neuroscience approach at identifying target patient populations and utilizing our approach to enrich our patient population in our clinical trials;
- our ability to maintain existing, and establish new, strategic collaborations or other arrangements and the financial terms of any such agreements, including the timing and amount of any future milestone, royalty or other payments due under any such agreement;
- our ability to access additional multimodal patient datasets;
- the costs and timing of future commercialization activities, including manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval;
- expenses to attract, hire and retain skilled personnel;
- the costs of operating as a public company;
- our ability to establish a commercially viable pricing structure and obtain approval for coverage and adequate reimbursement from third-party and government payers;
- the effect of macroeconomic trends including inflation, tariffs, and interest rates;
- addressing any potential supply chain interruptions or delays, including those related to geopolitical issues;
- the effect of competing technological and market developments; and
- the extent to which we acquire or invest in business, products and technologies.

Based upon our current operating plan, we believe that our existing cash, cash equivalents and marketable securities will enable us to fund our operating expenses and capital expenditure requirements through at least the next 12 months following the issuance of the consolidated financial statements. However, we anticipate that we will need to raise additional financing in the future to fund our operations, including the commercialization of any approved product candidates. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we expect. We may also raise additional financing on an opportunistic basis in the future. We expect to continue to expend significant resources for the foreseeable future.

To complete the development and commercialization of our product candidates, if approved, we will require substantial additional funding. Until such time as we can generate significant revenue from sales of our product candidates, if ever, we expect to finance our operations through public or private equity offerings or debt financings or other capital sources, which may include strategic collaborations or other arrangements with third parties, or other sources of financing.

Cash Flows

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

	Year Ended December 31,		
	2024	**2023**	**2022**
		(in thousands)	
Net cash (used in) provided by:			
Operating activities	$ (182,936)	$ (163,278)	$ (114,896)
Investing activities	(70,557)	64,387	(168,013)
Financing activities	21,603	231,936	115,743
Net change in cash and cash equivalents and restricted cash	$ (231,890)	$ 133,045	$ (167,166)

Operating Activities

Net cash used in operating activities for the twelve months ended December 31, 2024 was $182.9 million, which consisted of a net loss of $243.8 million, partially offset by a change in our net operating assets and liabilities of $22.6 million and noncash charges of $38.2 million. The change in our net operating assets and liabilities primarily resulted from a decrease of $15.9 million in prepaid expenses and other current assets related to our clinical programs and the Amgen Collaboration Agreement and an increase of $7.2 million and $2.9 million in accrued liabilities and accounts payable, respectively, primarily related to our clinical programs and timing of our accounts payable, partially offset by a decrease in operating lease liabilities of $3.4 million. The noncash charges primarily consisted of $40.0 million of stock-based compensation and $3.3 million of noncash operating lease expense, partially offset by $5.7 million of net accretion of discounts on marketable securities.

Net cash used in operating activities for the year ended December 31, 2023 was $163.3 million, which consisted of a net loss of $235.9 million and a change in our net operating assets and liabilities of $8.9 million, which was partially offset by $17.6 million in noncash charges and $63.9 million IPR&D expense related to achievement of the Phase 3 navacaprant development milestone and a milestone payment under our Vanderbilt in-license agreement. The change in our net operating assets and liabilities primarily resulted from and an increase of $11.4 million in prepaid expenses and other current assets related to our clinical programs and a decrease of $3.4 million in operating lease liabilities, partially offset by an increase of $5.9 million in accounts payable and accrued liabilities due to increased activities and the timing of our accounts payable. The noncash charges primarily consisted of $17.2 million of stock-based compensation, $3.4 million of noncash operating lease expense and $0.7 million of depreciation and amortization, partially offset by $3.7 million of net accretion of discounts on marketable securities.

Investing Activities

Net cash used in investing activities for the twelve months ended December 31, 2024 was $70.6 million, which primarily consisted of $312.2 million in purchases of marketable securities, partially offset by $242.4 million in proceeds from sales and maturities of marketable securities.

Net cash provided by investing activities for the year ended December 31, 2023 was $64.4 million, which primarily consisted of $178.2 million in proceeds from sales and maturities of marketable securities, partially offset by $109.1 million in purchases of marketable securities and $4.6 million cash paid for acquisition of assets, including upon achievement of milestones.

Financing Activities

Net cash provided by financing activities for the twelve months ended December 31, 2024 was $21.6 million, which primarily consisted of proceeds from the exercise of stock options of $7.5 million and net proceeds from the ATM offering of $13.7 million.

Net cash provided by financing activities for the year ended December 31, 2023 was $231.9 million, which primarily consisted of $232.6 million in proceeds from the issuance of common stock upon the completion of our IPO, net of underwriting commissions and discounts and $2.9 million in proceeds from exercise of stock options, partially offset by $3.8 million in payments of issuance costs in connection with our IPO.

Contractual Obligations and Other Commitments

Our contractual obligations and commitments relate primarily to our operating lease for our office and laboratory facilities located in Massachusetts with a noncancelable lease term expiring in June 2025. As of December 31, 2024, undiscounted future minimum lease payments of $1.9 million remain on our operating lease. See Note 7 – Commitments and Contingencies to our consolidated financial statements for further information.

We have entered into a number of acquisitions of assets that are summarized in Note 6 – Acquisitions of Assets to our consolidated financial statements. As part of these acquisitions of assets, we are obligated to pay cash and/or stock for future contingent payments that are dependent upon future events, and in some cases, vesting by the recipient of the contingent payment, such as our achievement of certain development, regulatory, and commercial milestones. We have also assumed license arrangements with various third parties, primarily as a result of our acquisitions, and have entered into additional agreements that are summarized in Note 8 –Strategic License and Research and Collaboration Agreements to our consolidated financial statements. In accordance with these agreements, we are obligated to pay, among other items, future contingent payments that are uncertain and dependent upon future events such as our achievement of certain development, regulatory, and commercial milestones royalties, and sublicensing revenue in the future, as applicable.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of the financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with the U.S. generally accepted accounting principles, or GAAP. The preparation of our consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, expenses, and related disclosures. Our estimates are based on historical experience and on various other factors that are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Our significant accounting policies are described in Note 2 to our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K. Certain of these significant accounting policies are important to understanding and evaluating our reported financial results.

Research and Development Expenses and Related Accrued Expenses

We record research and development expenses to operations as incurred. Research and development expenses represent costs incurred by us for the discovery and development of our product candidates and the development of our precision neuroscience technology and include: internal research and development expense, including personnel-related expenses (such as salaries, benefits and noncash stock-based compensation) and other expenses, including laboratory supplies and other non-capital equipment utilized for in-house research, research and consulting expenses, software development costs, license fees and allocated expenses, including facilities costs and depreciation and amortization; external research and development expenses incurred under arrangements with vendors conducting research and development services on our behalf, such as CROs, preclinical testing organizations, or CMOs. Costs to develop our technologies are recorded as research and development expense unless the criteria to be capitalized as internal-use software costs is met.

We have entered into various agreements with CROs and other vendors for clinical, non-clinical and manufacturing services. Payments made prior to the receipt of goods or services to be used in research and development are capitalized and recognized as expense in the period in which the related goods are received or services are realized or consumed. If the costs have been prepaid, this expense reduces the prepaid expenses in the consolidated balance sheets, and if not yet invoiced, the costs are included in accrued liabilities in the consolidated balance sheets. These costs are a significant component of our research and development expenses. We record amortization of prepaid expenses for these costs based on the estimated amount of work completed and in accordance with agreements established with these third parties. Such payments are evaluated for current or noncurrent classification based on when they will be realized. We estimate and record accrued research and development expenses based on the level of services performed but not yet invoiced pursuant to agreements established with our service providers, according to the progress of preclinical studies, clinical trials or related activities, and discussions with applicable personnel and service providers as to the progress or state of consummation of goods and services.

During the course of a clinical trial, the rate of expense recognition is adjusted if actual results differ from our estimates. We make judgments and estimates of accrued expenses as of each balance sheet date in our consolidated financial statements based on the facts and circumstances known at that time. The clinical trial accrual is dependent in part upon the timely and accurate reporting of CROs, CMOs and other third-party vendors. Although we do not expect our estimates to be materially different from amounts actually incurred, our estimates may vary from the actual results. To date, we have not experienced material differences between our accrued expenses and actual expenses.

We have and may continue to enter into license agreements to access and utilize certain technology. We evaluate if the license agreement is an acquisition of an asset or a business. To date, none of our license agreements have been considered to be an acquisition of a business. For acquisitions of assets, the upfront payments to acquire such licenses, as well as any future milestone payments made before product approval, are immediately recognized as acquired in-process research and development expense when due, provided there is no alternative future use of the rights in other research and development projects. These license agreements may also include contingent consideration in the form of cash. We assess whether such contingent consideration is subject to liability classification and fair value measurement or meets the definition of a derivative. Contingent consideration payments not required to be classified as a liability are accounted for as derivatives that qualify for a scope exception from derivative accounting, and are recognized when the contingency is resolved and the consideration is paid or becomes payable.

JOBS Act Accounting Smaller Reporting Company Elections

We were an "emerging growth company," as defined in the JOBS Act until December 31, 2024. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act until those standards apply to private companies.

We have elected to use this extended transition period for complying with certain new or revised accounting standards that have different effective dates for public and private companies until the date we lost emerging growth company status. As a result, our consolidated financial statements may or may not be comparable to companies that comply with new or revised accounting pronouncements as of public companies' effective dates.

We were also a "smaller reporting company," as defined in the Exchange Act until December 31, 2024, and we have elected to take advantage of certain of the scaled disclosures available to smaller reporting companies.

Recent Accounting Pronouncements

See Note 2 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K for more information.

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

We are exposed to market risk in the ordinary course of our business. Market risk represents the risk of loss that may impact our financial condition due to adverse changes in financial market prices and rates. Our market risk exposure is primarily the result of fluctuations in interest rates and foreign currency exchange rates.

Foreign Currency Exchange Risk

Operating in international markets involves exposure to possible volatile movements in currency exchange rates. A majority of our expenses are transacted in U.S. dollars and our assets and liabilities together with our cash holdings are predominately denominated in U.S. dollars reducing the exposure to currency fluctuations.

If the volume of our international operations increases and foreign currency exchange rates change, the impact to our consolidated statements of operations could be significant and may affect the comparability of operating results. We do not believe a 10% increase or decrease in foreign exchange rates would have resulted in a material impact to our operating results.

ITEM 8. Financial Statements and Supplementary Data.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Audited Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

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

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Neumora Therapeutics, Inc. (the Company) as of December 31, 2024 and 2023, the related consolidated statements of operations and comprehensive loss, convertible preferred stock and stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2024, 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, 2024 and 2023, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2024 in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2024, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), and our report dated March 3, 2025 expressed an unqualified opinion thereon.

Basis for Opinion

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud.

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

Critical Audit Matter

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

Accrued clinical trial and preclinical costs

Description of the Matter	The Company recorded accrued clinical trial and preclinical costs of $11.6 million as of December 31, 2024. As described in Note 2, the Company estimates and records accrued expenses for the related research and development activities based on the level of services performed but not yet invoiced pursuant to agreements established with its service providers, according to the progress of preclinical studies, clinical trials or related activities, and discussions with applicable personnel and service providers as to the progress or state of consummation of goods and services. Auditing the accounting for accrued clinical trial and preclinical costs is challenging as evaluating the progress of the activities being performed under the Company's research and development agreements is dependent upon the accumulation of a high volume of information from third party service providers.

How We Addressed the Matter in Our Audit	To test the Company's accounting for accrued clinical trial and preclinical costs, our audit procedures included, among others, obtaining direct confirmation from third parties of contract terms and conditions and the research and development activities performed for significant clinical trials and comparing such data to the inputs used in management's analyses to determine the costs incurred. We inspected key terms, timelines of completion, activities and costs for a sample of vendor contracts, including amendments, and compared these to management's analyses used in tracking the progress of service agreements. We met with internal clinical personnel to understand the status of significant clinical trial activities. We also tested a sample of subsequent payments by agreeing the invoice to the original accrual and the invoices payments to the bank statements.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2020.

San Jose, California
March 3, 2025

Report of Independent Registered Public Accounting Firm

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

Opinion on Internal Control Over Financial Reporting

We have audited Neumora Therapeutics, Inc.'s internal control over financial reporting as of December 31, 2024, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Neumora Therapeutics, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2024, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets as of December 31, 2024 and 2023, the related consolidated statements of operations and comprehensive loss, convertible preferred stock and stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2024, and the related notes and our report dated March 3, 2025 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

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

Definition and Limitations of Internal Control Over Financial Reporting

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

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young LLP

San Jose, California

March 3, 2025

NEUMORA THERAPEUTICS, INC.
Consolidated Balance Sheets
(in thousands, except par values)

	December 31, 2024	December 31, 2023
Assets		
Current assets:		
Cash and cash equivalents	$ 142,148	$ 374,038
Restricted cash	1,213	—
Short-term marketable securities	165,430	79,944
Prepaid expenses and other current assets	5,264	24,297
Total current assets	314,055	478,279
Long-term marketable securities	—	9,845
Property and equipment, net	1,140	1,790
Operating lease right-of-use assets	1,777	5,068
Restricted cash	—	1,213
Total assets	$ 316,972	$ 496,195
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 3,307	$ 337
Accrued liabilities	24,593	21,257
Early exercise liability, current portion	133	139
Operating lease liabilities, current portion	1,853	3,378
Total current liabilities	29,886	25,111
Operating lease liabilities, net of current portion	—	1,853
Early exercise liability, net of current portion	22	155
Total liabilities	29,908	27,119
Commitments and contingencies (Note 7)		
Stockholders' equity:		
Preferred stock, $0.0001 par value; 50,000 shares authorized as of December 31, 2024 and December 31, 2023; no shares issued and outstanding as of December 31, 2024 and December 31, 2023.	—	—
Common stock, $0.0001 par value; 700,000 shares authorized as of December 31, 2024 and December 31, 2023; 161,710 and 158,832 shares issued and outstanding as of December 31, 2024 and December 31, 2023, respectively.	16	16
Additional paid-in capital	1,234,207	1,172,570
Accumulated other comprehensive (gain) loss	62	(76)
Accumulated deficit	(947,221)	(703,434)
Total stockholders' equity	287,064	469,076
Total liabilities and stockholders' equity	$ 316,972	$ 496,195

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

NEUMORA THERAPEUTICS, INC.

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

	Year Ended December 31,		
	2024	**2023**	**2022**
Operating expenses:			
Research and development	$ 200,927	$ 142,719	$ 91,749
General and administrative	62,537	45,475	31,121
Acquired in-process research and development	—	63,904	13,000
Total operating expenses	263,464	252,098	135,870
Loss from operations	(263,464)	(252,098)	(135,870)
Other income (expense):			
Interest income	19,933	16,611	4,561
Other income (expense), net	(78)	(170)	405
Total other income	19,855	16,441	4,966
Net loss before income taxes	(243,609)	(235,657)	(130,904)
Provision for income taxes	178	268	—
Net loss	(243,787)	(235,925)	(130,904)
Other comprehensive income (loss):			
Unrealized gain (loss) on marketable securities	138	698	(774)
Comprehensive loss	$ (243,649)	$ (235,227)	$ (131,678)
Net loss per share, basic and diluted	$ (1.53)	$ (3.63)	$ (4.81)
Weighted-average shares outstanding, basic and diluted	159,377	65,021	27,207

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

NEUMORA THERAPEUTICS, INC.
Consolidated Statements of Convertible Preferred Stock and Stockholders' Equity (Deficit)
(in thousands)

	Convertible Preferred Stock		Common Stock		Additional Paid-In	Accumulated Other Comprehensive Gain	Accumulated	Total Stockholders' Equity
	Shares	Amount	Shares	Amount	Capital	(Loss)	Deficit	(Deficit)
Balance as of December 31, 2021	94,710	$ 729,858	31,985	$ 3	$ 11,381	$ —	$ (336,605)	$ (325,221)
Issuance of Series A-1 convertible preferred stock upon exercise of warrants	157	1,613	—	—	—	—	—	—
Issuance of Series B convertible preferred stock, net of issuance costs of $179	9,550	112,216	—	—	—	—	—	—
Issuance of common stock upon early exercise of stock options	—	—	442	—	—	—	—	—
Issuance of common stock upon exercise of stock options	—	—	228	—	612	—	—	612
Issuance of common stock as noncash consideration related to acquisition of assets	—	—	5	—	24	—	—	24
Forfeiture of restricted stock subject to repurchase	—	—	(48)	—	—	—	—	—
Vesting of restricted common stock	—	—	—	—	1,115	—	—	1,115
Unrealized loss on marketable debt securities	—	—	—	—	—	(774)	—	(774)
Stock-based compensation	—	—	—	—	8,298	—	—	8,298
Net loss	—	—	—	—	—	—	(130,904)	(130,904)
Balance as of December 31, 2022	104,417	$ 843,687	32,612	$ 3	$ 21,430	$ (774)	$ (467,509)	$ (446,850)
Conversion of convertible preferred stock into common stock upon initial public offering	(104,417)	(843,687)	104,417	10	843,677	—	—	843,687
Issuance of common stock upon initial public offering, net of offering costs of $23,546	—	—	14,710	1	226,523	—	—	226,524
Issuance of common stock upon achievement of milestone related to acquisition of assets	—	—	6,072	1	58,538	—	—	58,539
Issuance of common stock upon exercise of stock options	—	—	972	1	2,855	—	—	2,856
Sale and issuance of common stock	—	—	127	—	810	—	—	810
Issuance of restricted common stock subject to repurchase	—	—	382	—	—	—	—	—
Repurchase of unvested early exercised stock options	—	—	(123)	—	—	—	—	—
Forfeiture of restricted stock subject to repurchase	—	—	(337)	—	—	—	—	—
Vesting of restricted common stock	—	—	—	—	1,497	—	—	1,497
Unrealized gain on marketable debt securities	—	—	—	—	—	698	—	698
Stock-based compensation	—	—	—	—	17,240	—	—	17,240
Net loss	—	—	—	—	—	—	(235,925)	(235,925)
Balance as of December 31, 2023	—	$ —	158,832	$ 16	$ 1,172,570	$ (76)	$ (703,434)	$ 469,076
Issuance of common stock upon exercise of stock options	—	—	1,957	—	7,482	—	—	7,482
Issuance of common stock under employee stock purchase plan	—	—	52	—	427	—	—	427
Issuance of common stock through at-the-market transactions net of offering costs $0.8 million	—	—	885	—	13,598	—	—	13,598
Forfeiture of restricted stock subject to repurchase	—	—	(99)	—	—	—	—	—
Vesting of restricted common stock	—	—	88	—	—	—	—	—
Vesting of common stock subject to repurchase	—	—	—	—	140	—	—	140
Repurchase of unvested early exercised stock options	—	—	(5)	—	—	—	—	—
Unrealized gain on marketable debt securities	—	—	—	—	—	138	—	138
Stock-based compensation	—	—	—	—	39,990	—	—	39,990
Net loss	—	—	—	—	—	—	(243,787)	(243,787)
Balance as of December 31, 2024	—	$ —	161,710	$ 16	$ 1,234,207	$ 62	$ (947,221)	$ 287,064

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

NEUMORA THERAPEUTICS, INC.

Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,		
	2024	2023	2022
Operating activities:			
Net loss	$ (243,787)	$ (235,925)	$ (130,904)
Adjustments to reconcile net loss to net cash used in operating activities:			
Acquired in-process research and development	—	63,904	13,000
Stock-based compensation	39,990	17,240	8,298
Non-cash operating lease expense	3,290	3,355	2,103
Depreciation and amortization	631	668	594
Net accretion of investments in marketable securities	(5,719)	(3,741)	(708)
Change in fair value of convertible preferred stock warrants	—	—	(559)
Other noncash expenses	23	120	228
Changes in operating assets and liabilities:			
Prepaid expenses and other current assets	15,905	(11,401)	(3,628)
Other assets	—	—	1,373
Accounts payable	2,873	(581)	(1,246)
Accrued liabilities	7,236	6,486	(1,621)
Operating lease liabilities	(3,378)	(3,403)	(1,826)
Net cash used in operating activities	(182,936)	(163,278)	(114,896)
Investing activities:			
Purchases of marketable securities	(312,223)	(109,072)	(226,369)
Cash paid for acquisition of assets, including upon achievement of milestones	(775)	(4,590)	(13,000)
Proceeds from maturities of marketable securities	242,441	178,166	71,867
Purchases of property and equipment	—	(117)	(511)
Net cash provided by (used in) investing activities	(70,557)	64,387	(168,013)
Financing activities:			
Proceeds from issuance of common stock upon initial public offering, net of underwriting discounts and commissions	—	232,565	—
Proceeds from issuance of common stock in at-the-market transactions, net of commissions and offering costs	13,694	—	—
Proceeds from issuance of convertible preferred stock, net of issuance costs	—	—	112,216
Proceeds from exercise of stock options	7,482	2,856	2,658
Proceeds from employee stock purchase plan purchases	427	—	—
Proceeds from exercise of warrants	—	—	1,613
Proceeds from issuance of common stock	—	810	—
Repurchase of unvested early exercised shares	—	(491)	—
Payments for deferred offering costs	—	(3,804)	(744)
Net cash provided by financing activities	21,603	231,936	115,743
Net change in cash and cash equivalents and restricted cash	(231,890)	133,045	(167,166)
Cash and cash equivalents and restricted cash at beginning of year	375,251	242,206	409,372
Cash and cash equivalents and restricted cash at end of period	$ 143,361	$ 375,251	$ 242,206
Components of cash and restricted cash:			
Cash and cash equivalents	$ 142,148	$ 374,038	$ 240,943
Restricted cash	1,213	1,213	1,263
Total cash and cash equivalents and restricted cash	$ 143,361	$ 375,251	$ 242,206
Supplemental disclosure of cash flow information:			
Operating lease liabilities arising from obtaining right-of-use assets	$ —	$ 192	$ 8,865
Cash paid for income taxes	$ 473	$ —	$ —
Supplemental disclosure of noncash investing and financing activities:			
Acquisition of assets included in accounts payable and accrued liabilities	$ —	$ 775	$ —
Purchase of property and equipment included in accounts payable	$ —	$ 44	$ 505
Conversion of preferred stock into common stock upon completion of initial public offering	$ —	$ 843,687	$ —
Issuance of common stock upon achievement of milestone related to acquisition of assets	$ —	$ 58,539	$ —
Offering costs related to initial public offering included in accounts payable and accrued liabilities	$ —	$ —	$ 340

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

1. Organization and Liquidity

Description of Business

Neumora Therapeutics, Inc. (the Company), was originally incorporated in the State of Delaware in November 2019, and is headquartered in Watertown, Massachusetts.

The Company is a clinical-stage biopharmaceutical company founded to confront the global brain disease crisis by taking a fundamentally different approach to the way treatments for brain diseases are developed. The Company has rapidly scaled its therapeutic pipeline, which currently consists of seven neuroscience programs, including two clinical programs, that target novel mechanisms of action for a broad range of underserved neuropsychiatric disorders and neurodegenerative diseases. The Company's most advanced product candidate, navacaprant (NMRA-140), is a novel once-daily oral kappa opioid receptor (KOR) antagonist that is being developed for the treatment of major depressive disorder (MDD), which the Company believes has the potential to provide significant advantages relative to the standard of care, if approved. Navacaprant is being investigated in the KOASTAL program, a pivotal Phase 3 program, evaluating navacaprant monotherapy in patients with moderate to severe MDD. Neumora expects to report topline data from KOASTAL-3 in the first quarter of 2026 and KOASTAL-2 in the second quarter of 2026. The Company's next most advanced product candidate is NMRA-511, a highly selective, novel antagonist of the vasopressin 1a receptor (V1aR) being developed for the treatment of agitation associated with dementia due to Alzheimer's disease (AD). The Company is advancing a Phase 1b signal-seeking study investigating NMRA-511 initially in healthy elderly adult participants and then people with agitation associated with dementia due to AD, and the Company expects to report data from this study in by the end of 2025. The Company's M4 positive allosteric modular (PAM) franchise comprises multiple novel compounds that each have different chemical composition but optimal pharmacological properties, which have demonstrated robust activity in preclinical efficacy models and high selectivity for the M4 receptor subtype. The Company expects to progress our next M4 PAM into the clinic by mid-2025.

Liquidity

The Company has incurred net losses and negative cash flows from operations since inception and as of December 31, 2024, had an accumulated deficit of $947.2 million. In September, 2023, the Company completed its initial public offering (IPO), pursuant to which it issued and sold an aggregate of 14,710,000 shares of its common stock at a price to the public of $17.00 per share, resulting in net proceeds of $226.5 million, after deducting underwriting discounts and commissions of $17.5 million and other offering expenses of $6.0 million. In October 2024, the Company entered into a sales agreement with Leerink Partners LLC (Leerink) to sell shares of the Company’s common stock, from time to time, with aggregate gross sales proceeds of up to $300.0 million, through an at-the-market equity offering program (ATM) with Leerink as the sales agent. During the year ended December 31, 2024, the Company received aggregate net proceeds of $13.7 million after deducting commissions and offering expenses of $0.8 million.

As of December 31, 2024, the Company had cash, cash equivalents and marketable securities of $307.6 million, which are available to fund future operations. The Company believes that its existing cash, cash equivalents and marketable securities as of December 31, 2024 will be sufficient to support operations for at least the next 12 months from the date these consolidated financial statements were available to be issued.

The Company expects to incur additional losses in the future as it continues its research and development efforts, advances its product candidates through preclinical and clinical development, enhances its precision neuroscience approach and programs, expands its product pipeline, seeks regulatory approval, prepares for commercialization, as well as hires additional personnel, protects its intellectual property and grows its business. The Company will need to raise additional capital to support its continuing operations and pursue its long-term business plan, including to complete the development and commercialization of its product candidates, if approved. Such activities are subject to significant risks and uncertainties, including clinical failure which can impact the Company’s ability to secure additional funding. The Company expects to finance its cash needs through a combination of public or private equity offerings or debt financings or other capital sources, which may include strategic collaborations or other arrangements with third parties, or other sources of financing. However, there is no guarantee that any of these financing or opportunities will be executed or realized on favorable terms, if at all, and some could be dilutive to existing stockholders.

2. Summary of Significant Accounting Policies and Basis of Presentation

Basis of Presentation and Consolidation

The accompanying consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles (U.S. GAAP) and applicable rules and regulations of the Securities and Exchange Commission (SEC) regarding annual financial reporting. The consolidated financial statements include all accounts of the Company and its wholly owned subsidiaries. All intercompany transactions and balances have been eliminated in consolidation.

In September, 2023, the Company's board of directors approved an amended and restated certificate of incorporation to effect a reverse split of shares of the Company's common stock and convertible preferred stock on a 7.8463-for-1 basis (the "Reverse Stock Split"). The par value and authorized shares of the common stock and convertible preferred stock were not adjusted as a result of the Reverse Stock Split. All share data and per share data amounts for all periods presented in the consolidated financial statements and notes thereto have been retrospectively adjusted to reflect the effect of the Reverse Stock Split.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts in the consolidated financial statements and accompanying notes. These estimates form the basis for judgments the Company makes about the carrying values of assets and liabilities that are not readily apparent from other sources. The Company bases its estimates and judgments on historical experience and on various other assumptions that the Company believes are reasonable under the circumstances. These estimates are based on management's knowledge about current events and expectations about actions the Company may undertake in the future. These judgments, estimates and assumptions are used for, but not limited to, accrued research and development expenses, accounting for acquisitions of assets, fair value of certain assets and liabilities, the fair value of the Company's convertible preferred stock, the fair value of the Company's common stock, stock-based compensation, the measurement of right-of-use assets and lease liabilities and related incremental borrowing rate, and uncertain tax positions and the valuation allowance for net deferred tax assets. Actual results may differ from the Company's estimates.

Risks and Uncertainties

The Company is subject to certain risks and uncertainties, including, but not limited to, changes in any of the following areas that the Company believes could have a material adverse effect on future financial position or results of operations: successfully develop, manufacture, and market any approved products; obtain regulatory approval from the U.S. Food and Drug Administration or foreign regulatory agencies prior to commercial sales; new technological innovations; dependence on key personnel, protection of intellectual property; compliance with governmental regulations; uncertainty of market acceptance of any approved products; product liability; and the need to obtain additional financing.

Cash and Cash Equivalents

All highly liquid investments, including money market funds, with original maturities of three months or less at the time of purchase are considered to be cash equivalents. All of the Company's cash equivalents have liquid markets and high credit ratings. The Company maintains its cash in bank deposits and other accounts.

Restricted Cash

Restricted cash consists of a facility lease agreement collateralized by a letter of credit pursuant to certain banking and lease agreements. Restricted cash, which is unavailable for a period of less than one year from the consolidated balance sheet date, is classified as a current asset.

Concentrations of Credit Risk

Financial instruments that potentially subject the Company to significant concentrations of credit risk consist primarily of cash and cash equivalents deposited in accounts at several financial institutions that may exceed the Federal Deposit Insurance Corporation's insurance limit. The Company is exposed to credit risk in the event of a default by the financial institutions holding its cash and cash equivalents to the extent recorded in the consolidated balance sheets. The Company believes it is not exposed to significant credit risk due to the financial position of the financial institutions in which those deposits are held.

Marketable Securities

The Company invests its excess cash in marketable debt securities with high credit ratings including but not limited to money market funds, securities issued by the U.S. government and its agencies, commercial paper and corporate debt securities that are accounted for as available-for-sale and carried at fair value. Marketable securities are classified as short-term or long-term based on the maturity date and their availability to meet current operating requirements. The amortized cost of debt securities is adjusted for amortization of premiums and accretion of discounts to maturity, which is included in interest income in the consolidated statements of operations and comprehensive loss. Realized gains and losses on marketable securities, if any, are included in other income (expense), net. The cost of securities sold is determined based on the trade date using the specific identification method.

The Company periodically assesses its available-for-sale debt securities for impairment. For debt securities in an unrealized loss position, this assessment first considers the Company's intent to sell, or whether it is more likely than not that it will be required to sell the security before recovery of its amortized cost basis. If either of these criteria are met, the debt security's amortized cost basis is written down to fair value within other income (expense), net. For debt securities in an unrealized loss position that do not meet the aforementioned criteria, the Company assesses whether the decline in fair value has resulted from credit losses or other factors. In making this assessment, the extent to which fair value is less than amortized cost, any changes to the rating of the security by a rating agency, and any adverse conditions specifically related to the security is considered, among other factors. If this assessment indicates that a credit loss may exist, the present value of cash flows expected to be collected from the security are compared to the amortized cost basis of the security. If the present value of cash flows expected to be collected is less than the amortized cost basis, a credit loss exists and an allowance for credit losses will be recorded in other income (expense), net, limited by the amount that the fair value is less than the amortized cost basis. Any additional impairment not recorded through an allowance for credit losses is recognized in other comprehensive income (loss). Changes in the allowance for credit losses are recorded as provision for (or reversal of) credit loss expense. Losses are charged against the allowance when management believes the un-collectability of an available-for-sale security is confirmed or when either of the criteria regarding intent or requirement to sell is met. These changes are recorded in other income (expense), net.

Fair Value of Financial Instruments

Fair value is defined as the price that would be received to sell 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 at the measurement date. The Company measures fair value by maximizing the use of observable inputs, where available, and minimizing the use of unobservable inputs when measuring fair value. Financial assets and liabilities recorded at fair value in the consolidated balance sheets are categorized in the fair value hierarchy based upon the lowest level of input that is significant to the fair value as follows:

> Level 1—Observable inputs such as unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date.
>
> Level 2—Inputs (other than quoted prices included in Level 1) are either directly or indirectly observable inputs for similar assets or liabilities. These include quoted prices for identical or similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.
>
> Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

To the extent that the valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. Accordingly, the degree of judgment exercised by the Company in determining fair value is greatest for instruments categorized in Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value of the instrument.

Property and Equipment, Net

Property and equipment, net is stated at cost less accumulated depreciation. Depreciation of property and equipment is computed using the straight-line method over the estimated useful lives of the assets, which is three to seven years. Leasehold improvements are amortized using the straight-line method over the lesser of the estimated useful lives of the assets or the remaining term of the lease. Construction in progress is stated at cost and not depreciated until the asset is placed into service. Upon sale or retirement of the assets, the cost and related accumulated depreciation are removed from the consolidated balance sheets and the resulting gain or loss is recognized in the consolidated statements of operations and comprehensive loss. Expenditures for maintenance and repairs are expensed as incurred.

Impairment of Long-Lived Assets

The Company reviews the carrying amount of its long-lived assets, including property and equipment and right-of-use assets, for impairment whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. If indicators of impairment exist, an impairment loss is recognized when the estimated undiscounted future cash flows expected to result from the use of the asset and its eventual disposition are less than its carrying amount. The impairment charge is determined based upon the excess of the carrying value of the asset over its estimated fair value, with estimated fair value determined based upon an estimate of discounted future cash flows or other appropriate measures of estimated fair value. Estimating discounted cash flows requires the Company to make significant judgments and assumptions. Actual results may vary from the Company's estimates as of the date of impairment testing and adjustments may occur in future periods. The Company believes that no impairment of long-lived assets is required as of and for the years ended December 31, 2024, 2023, and 2022.

Leases

The Company determines if an arrangement is or contains a lease at inception by assessing whether it conveys the right to control the use of an identified asset in exchange for consideration. If a lease is identified, classification is determined at lease commencement. To date, all of the Company's leases have been determined to be operating leases. Operating lease liabilities are recognized at the present value of the future lease payments at the lease commencement date. The Company's leases do not provide an implicit interest rate and therefore the Company estimates its incremental borrowing rate to discount lease payments. The incremental borrowing rate reflects the estimated interest rate that the Company would have to pay to borrow on a collateralized basis, an amount equal to the lease payments in a similar economic environment over a similar term. Operating lease right-of-use (ROU) assets are determined based on the corresponding lease liability adjusted for any lease payments made at or before commencement, initial direct costs, and lease incentives. The operating lease ROU asset also includes impairment charges if the Company determines the ROU asset is impaired. The Company considers a lease term to be the noncancelable period that it has the right to use the underlying asset, including any periods where it is reasonably assured the Company will exercise the option to extend the contract. Periods covered by an option to extend are included in the lease term if the lessor controls the exercise of that option. Operating lease expenses are recognized, and the ROU assets are amortized on a straight-line basis over the lease term. The Company has elected to not separate lease and non-lease components for its leased assets and accounts for all lease and non-lease components of its agreements as a single lease component. The Company has elected not to recognize on the consolidated balance sheets leases with terms of one year or less.

Acquisitions

The Company evaluates mergers, acquisitions, and other similar transactions to assess whether or not the transaction should be accounted for as a business combination or an acquisition of assets. The Company first identifies who is the acquiring entity by determining if the target is a legal entity or a group of assets or liabilities. If control over a legal entity is being evaluated, the Company also evaluates if the target is a variable interest or voting interest entity. For acquisitions of voting interest entities, the Company applies a screen test to determine if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets. If the screen test is met, the transaction is accounted for as an acquisition of assets. If the screen is not met, further determination is required as to whether or not the Company has acquired inputs and processes that have the ability to create outputs which would meet the definition of a business. Significant judgment is required in the application of the screen test to determine whether an acquisition is a business combination or an acquisition of assets.

For an acquisition of assets, a cost accumulation model is used to determine the cost of the acquisition. Common stock and convertible preferred stock issued as consideration in an acquisition of assets are generally measured based on the acquisition date fair value of the equity interests issued. Direct transaction costs are recognized as part of the cost of an acquisition of assets. The Company also evaluates which elements of a transaction should be accounted for as a part of an acquisition of assets and which should be accounted for separately.

The cost of an acquisition of assets, including transaction costs, are allocated to identifiable assets acquired and liabilities assumed based on a relative fair value basis. Goodwill is not recognized in an acquisition of assets. Any difference between the cost of an acquisition of assets and the fair value of the net assets acquired is allocated to the non-monetary identifiable assets based on their relative fair values. Assets acquired as part of an acquisition of assets that are considered to be in-process research and development intangible assets (IPR&D) are immediately expensed and recorded as a component of acquired in-process research and development expense in the consolidated statements of operations and comprehensive loss unless there is an alternative future use in other research and development projects.

In addition to upfront consideration, the Company's acquisitions of assets may also include contingent consideration payments to be made for future milestone events or royalties on net sales of future products. The Company assesses whether such contingent consideration is subject to liability classification and fair value measurement or meets the definition of a derivative. Contingent consideration payments in an acquisition of assets not required to be classified as a liability at fair value, or are accounted for as derivatives that qualify for a scope exception from derivative accounting, are recognized when the contingency is resolved, and the consideration is paid or becomes payable. Contingent consideration payments required to be classified as a liability, or are accounted for as derivatives and do not qualify for a scope exception from derivative accounting, are recorded at fair value on the date of the acquisition and are subsequently remeasured to fair value at each reporting date. Contingent consideration payments made prior to regulatory approval are expensed as incurred. Any future payments that are contingent upon continued services to the Company are treated as compensation and recognized when it is probable such amounts will become payable.

If the target legal entity is determined to be a variable interest entity (VIE) and not a business, all tangible and intangible assets acquired, including any IPR&D assets but excluding goodwill, and liabilities assumed, including contingent consideration, are recorded at their fair values. If the acquisition is determined to be a business combination, all tangible and intangible assets acquired, including any IPR&D assets, and liabilities assumed, including contingent consideration, are recorded at their fair values. Goodwill is recognized for any difference between the consideration transferred and fair value determination. In addition, direct transaction costs in connection with business combinations are expensed as incurred, rather than capitalized.

The tax basis of assets acquired in either a business combination or acquisition of assets are compared to the book basis of such assets resulting in the recognition of deferred tax assets and liabilities.

Research and Development Expenses and Related Prepaid Assets and Accrued Liabilities

Research and development costs are expensed as incurred. Research and development expenses primarily consist of internal research and development expense, including personnel-related expenses (such as salaries, benefits and noncash stock-based compensation) and other expenses, including laboratory supplies and other non-capital equipment utilized for in-house research, research and consulting expenses, software development costs, license fees and allocated expenses, including facilities costs and depreciation and amortization; external research and development expenses incurred under arrangements with service providers conducting research and development services on its behalf, such as contract research organizations (CROs), preclinical testing organizations and contract manufacturing organizations (CMOs). Payments made prior to the receipt of goods or services to be used in research and development are capitalized, evaluated for current or long-term classification, and included in prepaid expenses and other current assets or other assets in the consolidated balance sheets based on when the goods are received or the services are expected to be received or consumed, and recognized in research and development expenses when they are realized.

The Company is required to estimate expenses resulting from its obligations under contracts with service providers in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations which vary from contract to contract and may result in cash flows that do not match the periods over which materials or services are provided. The Company estimates and records accrued expenses for the related research and development activities based on the level of services performed but not yet invoiced pursuant to agreements established with its service providers, according to the progress of preclinical studies, clinical trials or related activities, and discussions with applicable personnel and service providers as to the progress or state of consummation of goods and services.

During the course of a clinical trial, the rate of expense recognition is adjusted if actual results differ from the Company's estimates. The Company estimates accrued expenses as of each balance sheet date in its consolidated financial statements based on the facts and circumstances known at that time. The clinical trial accrual is dependent in part upon the timely and accurate reporting of CROs, CMOs and other service providers. Although the Company does not expect its estimates to be materially different from amounts actually incurred, its estimate may vary from the actual results. To date, the Company has not experienced material differences between its accrued expenses and actual expenses.

Stock-Based Compensation

The Company maintains equity incentive plans (the Plans) as a long-term incentive for employees, directors, and service providers. The Company accounts for all stock-based awards based on their fair value on the date of the grant. For stock-based awards with service only vesting conditions, the Company recognizes expense on a straight-line basis over the requisite service period, which is generally the vesting period of the respective award. For awards with performance vesting conditions, the Company evaluates the probability of achieving the performance vesting condition at each reporting date. The Company begins to recognize expense for awards with performance-based vesting conditions using an accelerated attribution method when it is deemed probable that the performance condition will be met. For awards with both market and service vesting conditions, the Company recognizes expense using the accelerated attribution method over the derived requisite service period. Stock-based compensation is classified in the consolidated statements of operations and comprehensive loss based on the function to which the related services are provided. Forfeitures are accounted for as they occur.

The fair value of stock option awards with only service conditions and/or performance-based vesting conditions are estimated on the date of grant using the Black-Scholes option pricing model, which requires inputs based on certain subjective assumptions, including the expected stock price volatility, the expected term of the option, the risk-free interest rate for a period that approximates the expected term of the option, and the expected dividend yield. The fair value of stock options awards with market-based vesting conditions is estimated on the grant date using the Monte Carlo simulation model, which utilizes subjective assumptions, including volatility and the derived service periods, that determine the probability of satisfying the market condition stipulated in the award to estimate the fair value of the award. The fair value of restricted stock is based on the estimated fair value of the Company's common stock on the grant date.

Income Taxes

The Company accounts for income taxes under the asset and liability method. Under this method, deferred tax assets and liabilities are recognized for the expected future tax consequences of events that have been included in the Company's consolidated financial statements and tax returns. Deferred tax assets and liabilities are determined based upon the differences between the financial statement carrying amounts and the tax bases of existing assets and liabilities and for loss and credit carryforwards, using enacted tax rates expected to be in effect in the year in which the differences are expected to reverse. Deferred tax assets are reduced by a valuation allowance if it is more likely-than-not that these assets may not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which the temporary differences representing net future deductible amounts become deductible.

The Company recognizes and measures uncertain tax positions using a two-step approach. The Company determines whether it is more likely than not that a tax position will be sustained upon examination. If it is not more likely-than-not that a position will be sustained, none of the benefit attributable to the position is recognized. The tax benefit to be recognized for any tax position that meets the more-likely-than-not recognition threshold is calculated as the largest amount that is more than 50% likely of being realized upon resolution of the contingency. Judgment is required to evaluate uncertain tax positions. The Company evaluates uncertain tax positions on a regular basis. The evaluations are based on a number of factors, including changes in facts and circumstances, changes in tax law, correspondence with tax authorities during the course of the audit, and effective settlement of audit issues.

The Company's policy is to include penalties and interest expense related to income taxes as a component of its provision for income taxes. The Company has not reported any interest or penalties associated with income tax for any period presented.

Net Loss Per Share

Basic net loss per share is calculated by dividing net loss by the weighted-average number of shares of common stock outstanding during the period, without consideration for common stock equivalents. Diluted net loss per share is the same as basic net loss per share, since the effects of potentially dilutive securities are antidilutive given the net loss for each period presented.

Comprehensive Loss

Comprehensive loss includes net loss and certain changes in stockholders' equity (deficit) that are excluded from net loss, such as unrealized losses on the Company's available-for-sale marketable securities.

Emerging Growth Company Status

The Company was an emerging growth company, as defined in the Jumpstart Our Business Startups Act of 2012 (the JOBS Act) until December 31, 2024. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act, until such time as those standards apply to private companies. The Company has evaluated if any accounting standards which it previously delayed adopting would have a material impact to the consolidated financial statements or disclosures and concluded that there is no such material impact.

Recently Adopted Accounting Pronouncements

In November 2023, the FASB issued ASU 2023-07, *Segment Reporting* (ASU 2023-07), which requires issuers to make additional disclosures with respect to segment expenses, including required disclosure on an annual and interim basis for significant segment expenses and other segment items. The improved disclosure requirements apply to all public entities that are required to report segment information, including those with only one reportable segment. The Company adopted the guidance in the annual period ended December 31, 2024. There was no impact on the Company's reportable segments identified and additional required disclosures have been included in Note 14.

Recent Accounting Pronouncements Not Yet Adopted

In December 2023, the Financial Standards Accounting Board (FASB) issued Accounting Standards Update (ASU) 2023-09, *Income Taxes* (ASU 2023-09), which requires issuers to make additional discloses on an annual basis related to specific categories in the rate reconciliation and provide additional information for reconciling items that meet a quantitative threshold on an annual basis, disclose additional information about income taxes paid as well as other disaggregated disclosures. ASU 2023-09 is effective for the Company as of January 1, 2025 for annual periods. The Company is evaluating the impact of this ASU on its consolidated financial statements.

3. Cash Equivalents and Marketable Securities

The following tables summarize the amortized cost and fair value of the Company's cash equivalents and marketable securities by major investment category for the periods indicated:

	December 31, 2024			
	Amortized Cost	Gross Unrealized Gain	Gross Unrealized Loss	Estimated Fair Value
	(in thousands)			
Cash equivalents:				
Money market funds	$ 94,411	$ —	$ —	$ 94,411
Commercial paper	30,875	6	—	30,881
Total cash equivalents	$ 125,286	$ 6	$ —	$ 125,292
Marketable securities:				
Commercial paper	61,374	11	(2)	61,383
Certificates of deposit	1,918	—	—	1,918
U.S. government securities	74,411	36	(3)	74,444
Corporate debt securities	27,671	17	(3)	27,685
Total marketable securities	165,374	64	(8)	165,430
Total cash equivalents and marketable securities	$ 290,660	$ 70	$ (8)	$ 290,722

	December 31, 2023			
	Amortized Cost	Gross Unrealized Gain	Gross Unrealized Loss	Estimated Fair Value
	(in thousands)			
Cash equivalents:				
Money market funds	$ 306,801	$ —	$ —	$ 306,801
Commercial paper	42,455	6	—	42,461
U.S. government and agency debt securities	12,998	—	(6)	12,992
Total cash equivalents	$ 362,254	$ 6	$ (6)	$ 362,254
Marketable securities:				
Commercial paper	$ 47,534	$ 17	$ (4)	$ 47,547
U.S. government and agency debt securities	37,515	—	(91)	37,424
Corporate debt securities	4,816	3	(1)	4,818
Total marketable securities	89,865	20	(96)	89,789
Total cash equivalents and marketable securities	$ 452,119	$ 26	$ (102)	$ 452,043

As of December 31, 2024, the contractual maturities of all marketable securities is less than one year and the Company has not realized any material gains or losses on its marketable securities, including any impairment charges on its securities related to expected credit losses. As of December 31, 2024, the aggregate difference between the amortized cost and fair value of each security in an unrealized loss position was de minimis. Since any provision for expected credit losses for a security held is limited to the amount the fair value is less than its amortized cost, no allowance for expected credit loss was deemed necessary at December 31, 2024 (see Note 4).

4. Fair Value Measurements

The carrying amounts of the Company's financial instruments, including prepaid expenses and other current assets, accounts payable, accrued liabilities and the current portion of operating lease liabilities approximate fair value due to the short-term nature of those instruments.

The following tables summarize the Company's assets and liabilities measured at fair value on a recurring basis by level within the valuation hierarchy:

	December 31, 2024			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Assets:				
Cash equivalents:				
Money market funds	$ 94,411	$ —	$ —	$ 94,411
Commercial paper	—	30,881	—	30,881
Marketable securities:				
Commercial paper	—	61,383	—	61,383
Certificates of deposit	—	1,918	—	1,918
U.S. government securities	74,444	—	—	74,444
Corporate debt securities	—	27,685	—	27,685
Total assets measured at fair value	$ 168,855	$ 121,867	$ —	$ 290,722

	December 31, 2023			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Assets:				
Cash equivalents:				
Money market funds	$ 306,801	$ —	$ —	$ 306,801
Marketable securities:				
Commercial paper	—	90,008	—	90,008
U.S. government and agency debt securities	19,473	30,943	—	50,416
Corporate debt securities	—	4,818	—	4,818
Total assets measured at fair value	$ 326,274	$ 125,769	$ —	$ 452,043

Money market funds are highly liquid and actively traded marketable securities that generally transact at a stable $1.00 net asset value representing its estimated fair value. The Company estimates the fair value of its U.S. government and agency debt securities, commercial paper and corporate debt securities by taking into consideration valuations obtained from third-party pricing services. The pricing services utilize industry standard valuation models, including both income and market-based approaches, for which all significant inputs are observable, either directly or indirectly, to estimate fair value. These inputs include reported trades of and broker/dealer quotes on the same or similar securities, issuer credit spreads, benchmark securities, prepayment/default projections based on historical data, and other observable inputs.

5. Balance Sheet Components

Property and equipment, net

Property and equipment, net, consisted of the following:

	December 31, 2024	December 31, 2023
	(in thousands)	
Laboratory equipment	$ 2,844	$ 2,800
Computer and software	287	287
Furniture and fixtures	58	97
Construction in progress	—	41
Total property and equipment	3,189	3,225
Less: accumulated depreciation and amortization	(2,049)	(1,435)
Total property and equipment	$ 1,140	$ 1,790

Depreciation and amortization expense for the years ended December 31, 2024, 2023 and 2022 was $0.6 million, $0.7 million and $0.6 million, respectively. As of December 31, 2024, all of the Company's property and equipment was located in the United States.

Accrued Liabilities

Accrued liabilities consisted of the following:

	December 31, 2024	December 31, 2023
	(in thousands)	
Accrued clinical trial and preclinical costs	$ 11,606	$ 4,705
Compensation and benefits	9,975	10,011
Professional services	2,686	787
Other	326	750
Accrued research and development services (nil and $3.1 million due to related party in 2024 and 2023, respectively)	—	5,004
Total accrued liabilities	$ 24,593	$ 21,257

6. Acquisitions of Assets

BlackThorn Therapeutics, Inc.

In June 2020, the Company entered into an agreement and plan of merger (BlackThorn Merger Agreement) to acquire all of the equity interests of BlackThorn Therapeutics, Inc. (BlackThorn), which became effective in September 2020. The Company acquired BlackThorn for its in-process research and development programs, including an antagonist of the kappa opioid receptor (navacaprant (NMRA-140)) for the treatment of major depressive disorders and an antagonist of the vasopressin 1a receptor (NMRA-511) for the treatment of agitation in Alzheimer's disease. The Company also gained access to a cloud-based computational psychiatry and data platform that was being developed to support drug target identification, patient stratification and objective clinical trial endpoints. Both navacaprant and NMRA-511 were exclusively licensed to BlackThorn by The Scripps Research Institute (TSRI). The acquisition was accounted for as an acquisition of assets.

The BlackThorn Merger Agreement requires the Company to pay the former stockholders of BlackThorn contingent consideration (i) with respect to navacaprant, in the form of development and regulatory approval milestones of up to an aggregate amount of $365.0 million, which includes a milestone payment that became due in October 2023 upon dosing the first patient in the Phase 3 clinical trial for navacaprant, and sales-based milestones of up to an aggregate amount of $450.0 million and (ii) with respect to NMRA-511, in the form of development and regulatory approval milestones of up to an aggregate amount of $100.0 million, and sales-based milestones of up to an aggregate amount of $100.0 million (BlackThorn Milestones). At the Company’s sole discretion, the BlackThorn Milestone payments may be settled in cash or shares of the Company, or a combination of both, subject to the provisions of the BlackThorn Merger Agreement, other than one development milestone in the amount of $10.0 million, which must be settled in cash. None of the BlackThorn Milestones were subject to liability classification and/or derivative accounting and any such contingent consideration will be recognized when the contingency is resolved, and the consideration becomes payable. The Company settled the Phase 3 navacaprant dosing milestone in December 2023 by issuing 6,072,445 shares of its common stock based on the volume weighted average price per share prior to the date the milestone was met and paying cash of $2.3 million to the former stockholders of BlackThorn and participants in the carveout plan (discussed below). As a result, the Company recognized $60.8 million in acquired in-process research and developed expenses in the fourth quarter of 2023 related to the BlackThorn Milestones. None of the other Blackthorn Milestones have been achieved and no such amounts were deemed due or payable as of December 31, 2024.

BlackThorn Carveout Plan

The BlackThorn Merger Agreement required that the Company establish a carveout plan (the BlackThorn Carveout Plan), pursuant to which each BlackThorn stock option holder as of immediately prior to the closing date was allocated a certain number of units (the BlackThorn Carveout Units) based on the number of shares underlying the outstanding options held by each participant at that time. Each BlackThorn Carveout Unit represents a right to receive a portion of the BlackThorn Milestone payment (the BlackThorn Carveout Payments) upon the later of (i) the achievement of a BlackThorn Milestone and (ii) the vesting of the BlackThorn Carveout Unit.

The BlackThorn Carveout Units vest based on time-based schedules that mirror the vesting schedules for the original option awards held by each participant. As of the closing date in September 2020, a portion of the BlackThorn Carveout Units corresponding to the pre-acquisition service periods were fully vested (Vested Carveout Units). The remainder of the BlackThorn Carveout Units vest subject to the continued service of the participants.

The Vested Carveout Units represent contingent consideration for the acquisition as they are attributable to pre-acquisition services rendered by the participants and continuing service is not required for the participants to receive future payments upon a BlackThorn Milestone being achieved. The Company recognizes the contingent consideration obligation for the Vested Carveout Units when the contingency is resolved, and the consideration becomes payable. The BlackThorn Carveout Units that were unvested as of the closing date are dependent on the continued service of participants and were deemed to be a compensation arrangement. The Company recognizes compensation starting from the time payment becomes probable over each participant's service period.

The Company settled the Phase 3 navacaprant dosing milestone in December 2023. The Company recognized contingent consideration related to Vested Carveout Units, which was included in acquired in-process research and developed expenses in the fourth quarter of 2023 related to the BlackThorn Milestones as described above. In addition, the Company recognized and paid $1.8 million in compensation related to the BlackThorn Carveout Units that were a compensatory arrangement in 2023. None of the other BlackThorn Milestones had been achieved and no such amounts were deemed due or payable as of December 31, 2024.

Amgen Inc. Licenses

In September 2021, the Company entered into two license agreements with Amgen Inc. (Amgen) pursuant to which it obtained exclusive, worldwide licenses to develop, manufacture, use, commercialize and distribute products containing compounds that are directed to, in one case, CK1δ, and in the other case, glucocerebrosidase (GCase), both for the treatment of neurodegenerative diseases (the Amgen License Agreements) and related know-how and clinical material (collectively, the Amgen IPR&D Assets). The Company accounted for these transactions as acquisitions of assets. Concurrently, the Company also executed a research collaboration agreement as well as a stock purchase agreement with Amgen. Both agreements were deemed to be separate transactions and not accounted for as part of the acquisition of assets.

The total upfront consideration transferred to Amgen of 20.0 million shares of the Company's Series A-2 convertible preferred stock, with an acquisition date fair value of $157.0 million was allocated to the Amgen IPR&D Assets and expensed in 2021.

Under these two license agreements, Amgen is eligible to receive contingent consideration up to an aggregate of $360.0 million in commercial milestone payments per product payable in cash with a compound directed to CK1δ and up to an aggregate of $360.0 million in commercial milestone payments per product payable in cash with a compound directed to GCase, in each case, upon the achievement of certain sales thresholds and single digit royalties on potential future net sales, related to CK1δ or GCase (the Amgen Milestones). Such contingent consideration was not subject to liability classification and/or derivative accounting and will be recognized when the contingency is resolved, and the consideration becomes payable. As of December 31, 2024, none of the Amgen Milestones had been achieved and no such amounts were deemed due or payable.

In addition, until a specified period of time following the achievement of the first successful Phase 2 clinical trial for any licensed product, if the Company chooses to sell, transfer, sublicense or divest rights to a licensed product in certain major markets, Amgen has a period of time to enter into an agreement with the Company for such rights. The Company determined that these rights of first negotiation were not freestanding instruments from the Amgen License Agreements and did not meet the definition of a derivative.

Vanderbilt License

In February 2022, as amended in July 2023 and May 2024, the Company and Vanderbilt University (Vanderbilt) entered into a license agreement (Vanderbilt License Agreement). Pursuant to the Vanderbilt License Agreement, as amended, the Company obtained an exclusive, worldwide royalty-bearing, sublicensable (subject to certain restrictions) license under certain patent rights and a non-exclusive, worldwide, royalty-bearing, sublicensable (subject to certain restrictions) license under certain know-how covering small molecule positive allosteric modulators (PAMs) predominantly of the muscarinic acetylcholine receptor subtype 4 (M4) to develop, manufacture, and commercialize products, processes and services covered by such patent rights or that incorporate or use such know-how, for any and uses (the Vanderbilt IPR&D Assets). Concurrently, the Company also executed a sponsored research agreement (see Note 8) with Vanderbilt. The sponsored research agreement was deemed to be separate transactions and not accounted for as part of the acquisition of assets. The acquisition of Vanderbilt IPR&D Assets became effective in February 2022.

The licensed patent rights are subject to Vanderbilt's right to use the patent rights for research, internal non-commercial use, and educational purposes. The Company intends to develop the PAMs for the treatment of schizophrenia and other neuropsychiatric disorders. The Company has agreed to use commercially reasonable efforts to develop and commercialize licensed products, and to achieve certain development milestones.

The Company paid Vanderbilt a non-refundable, non-creditable upfront cash payment of $13.0 million for the Vanderbilt IPR&D Assets, which was immediately recognized as acquired in-process research and development expense in the condensed consolidated statement of operations and comprehensive loss as it was determined to have no alternative future use as of the acquisition date. Under the Vanderbilt License Agreement, Vanderbilt is eligible to receive contingent consideration payable in cash up to an aggregate of $42.4 million upon the achievement of specified development milestones and up to an aggregate of $380.0 million upon the achievement of commercial milestone events as well as tiered royalties at mid-single digit percentages on potential future net sales, subject to specified reductions for the lack of patent coverage, generic entry and payment obligations for third-party licenses (the Vanderbilt Milestones). Such contingent consideration was not subject to liability classification and/or derivative accounting and will be recognized when the contingency is resolved, and the consideration becomes payable. In October 2023, a $2.0 million Vanderbilt Milestone was achieved and settled in cash in November 2023 and was recognized in acquired in-process research and developed expenses in the fourth quarter of 2023. None of the other Vanderbilt Milestones had been achieved and no such amounts were deemed due or payable as of December 31, 2024.

In addition, the Company also had an exclusive option, exercisable for a specified period of time, to negotiate an exclusive license to certain patent rights conceived or developed by Vanderbilt in the course of carrying out the sponsored research pursuant to the sponsored research agreements between the Company and Vanderbilt, the first of which was entered into at the same time as the Vanderbilt License Agreement and the second of which was executed in May 2024. The Company determined that the right to negotiate was not a freestanding instrument from the Vanderbilt License Agreement and did not meet the definition of a derivative. The Company exercised the above disclosed exclusive option under the first sponsored research agreement and the parties executed an agreement in December 2023 pursuant to which the Company licensed certain patent rights in return for a payment of $0.8 million that was recognized in acquired in-process research and developed expenses in the fourth quarter of 2023.

7. Commitments and Contingencies

Operating Leases

Lease Agreement

In May 2022, the Company executed a sublease agreement for a 30,067 square feet office and laboratory facility in Watertown, Massachusetts. The term of the sublease commenced in June 2022 with respect to the office space and commenced in August 2022 with respect to the laboratory space. The term of the sublease expires in June 2025. A letter of credit was executed in connection with this sublease agreement that is included in restricted cash on the consolidated balance sheets. In August 2023, the sublease was amended to include 972 square feet of additional space, which also expires in June 2025.

Under the lease agreements, the Company is generally required to pay certain operating costs, in addition to rent, such as common area maintenance, taxes, utilities and insurance. Such additional charges are considered variable lease costs and are recognized in the period in which they are incurred. Rent expense for the year ended December 31, 2024 was $3.7 million. Short term lease expense and variable costs were immaterial. Rent expense for the year ended December 31, 2023 was $4.3 million, including $0.3 million related to short term lease expense, and variable costs were immaterial. Rent expense for the year ended December 31, 2022 was $3.5 million, including $1.1 million related to short term lease expense, and variable costs were $0.1 million.

The Company's operating leases include various covenants, indemnities, defaults, termination rights, security deposits and other provisions customary for lease transactions of this nature.

The maturity of the Company's operating lease liabilities as of December 31, 2024 were as follows (in thousands):

Undiscounted lease payments	
2025	1,892
Total undiscounted lease payments	1,892
Less: Imputed interest	(39)
Operating lease liabilities, current portion	$ 1,853

Supplemental information on the Company's operating leases was as follows:

	Year Ended December 31,		
	2024	2023	2022
Cash paid for operating lease agreements (in thousands)	$ 3,723	$ 4,071	$ 2,486
Weighted average remaining lease term (in years)	0.5	1.5	2.4
Weighted-average discount rate	10.0%	10.0%	10.0%

Indemnification

In the ordinary course of business, the Company enters into agreements that may include indemnification provisions. Pursuant to such agreements, the Company may indemnify, hold harmless and defend an indemnified party for losses suffered or incurred by the indemnified party. Some of the provisions will limit losses to those arising from third party actions. In some cases, the indemnification will continue after the termination of the agreement. The maximum potential amount of future payments the Company could be required to make under these provisions is not determinable. The Company has not incurred material costs to defend lawsuits or settle claims related to these indemnification provisions. The Company has also entered into indemnification agreements with its directors and officers that may require the Company to indemnify its directors and officers against liabilities that may arise by reason of their status or service as directors or officers to the fullest extent permitted by Delaware corporate law. The Company currently has directors' and officers' insurance.

Other Commitments

The Company has various manufacturing, clinical, research and other contracts with vendors in the conduct of the normal course of its business. Such contracts are generally terminable with advanced written notice and payment for any products or services received by the Company through the effective time of termination and any non-cancelable and non-refundable obligations incurred by the vendor at the effective time of the termination. In the case of terminating a clinical trial agreement at a particular site, the Company would also be obligated to provide continued support for appropriate medical procedures at that site until completion or termination.

8. Strategic License and Research and Collaboration Agreements

2015 TSRI License Agreement

In connection with the acquisition of BlackThorn (see Note 6), the Company gained certain exclusive rights to intellectual property related to Kappa Opioid Receptor and V1aR Receptor Antagonist programs as well as an oxytocin receptors positive allosteric modulator program (collectively, the TSRI Programs) under a license agreement between BlackThorn and TSRI originally entered into in November 2015 (as amended, the 2015 TSRI License Agreement). The technology licensed under the 2015 TSRI License Agreement is used in the Company's navacaprant and NMRA-511 research and development programs.

Pursuant to the 2015 TSRI License Agreement, the Company is obligated, among other things, to pay TSRI (i) a nominal annual license fee due and payable on the first day of each calendar year and after the fourth anniversary creditable against any royalties due for such calendar year, (ii) development and regulatory milestone payments of up to $1.5 million in aggregate for the first product from each TSRI Program, which are contingent upon achieving specific development and regulatory milestone events, (iii) commercial milestone payments of up to $3.5 million in aggregate for each occurrence, which are contingent upon achieving specified commercialization milestone events, (iv) tiered low-single digit royalties on future net sales of each royalty-bearing product and (v) a percentage in the mid-single digits of any sublicensing revenues the Company receives. In October 2023, the Phase 3 navacaprant dosing milestone was met and the Company paid $0.3 million to TSRI, which was recognized in acquired in-process research and developed expenses for the year ended December 31, 2023. None of the other milestones have been achieved and no royalties were due under the 2015 TSRI License Agreement as of December 31, 2024.

Research and Collaboration Agreement with Amgen

In September 2021, and concurrently with the Amgen License Agreements (see Note 6), the Company entered into a research collaboration agreement with Amgen (Amgen Collaboration Agreement) to collectively discover drug targets, biomarkers, and other insights associated with central nervous system (CNS) diseases utilizing Amgen's deCODE genetics and human data research capabilities. The Company received exclusive rights under intellectual property generated in the collaboration to exploit therapeutic compounds and diagnostics for use with therapeutics in the CNS field and Amgen received exclusive rights to exploit therapeutic compounds and diagnostics for use with therapeutics outside of the CNS field.

In return for Amgen performing research and development activities under the agreement, the Company committed to making non-refundable, non-creditable quarterly payments over the first two years totaling $50.0 million and for the third year $12.5 million. As of December 31, 2024, 2023, and 2022, the related prepaid research and development costs included in the consolidated balance sheets were nil, $6.3 million and $11.9 million, respectively, within prepaid expenses and other current assets. The Company recorded $12.5 million, $24.4 million and $25.1 million of research and development expenses during the years ended December 31, 2024, 2023, and 2022, respectively.

The Amgen Collaboration Agreement automatically terminated upon its third anniversary in September 2024.

Sponsored Research Agreement with Vanderbilt

In February 2022, concurrently with the Vanderbilt License Agreement (see Note 6), the Company entered into a sponsored research agreement with Vanderbilt (Vanderbilt Research Agreement), pursuant to which Vanderbilt agreed to provide the Company research services to develop a M4 PAM back-up program.

In return for Vanderbilt performing research and development activities under the agreement, the Company agreed to make quarterly payments for research up to a total of $1.7 million on an annual basis. The term of the agreement ended in September 2023. In addition, the Company also had an exclusive option to negotiate an exclusive license to certain patent rights conceived or developed by Vanderbilt in the course of carrying out the sponsored research (see Note 6).

In May 2024, concurrently with the Second Amendment to the Vanderbilt License Agreement (see Note 6), the Company entered into a second sponsored research agreement with Vanderbilt (Second Vanderbilt Research Agreement), pursuant to which Vanderbilt agreed to provide the Company additional research and development activities on the M4 PAM back-up program.

In return for Vanderbilt performing research and development activities under the agreement, the Company agreed to make payments for research up to a total of $0.5 million. The term of the agreement ended in November 2024. In addition, the Company also has an exclusive option to negotiate an exclusive license to certain patent rights conceived or developed by Vanderbilt in the course of carrying out the sponsored research (see Note 6).

Parkinson's Research Ventures Funding Agreement

In March 2024, the Company entered into a research funding agreement with Parkinson's Research Ventures Limited (PRV), pursuant to which PRV agreed to provide the Company funding up to a total of $2.6 million in two tranches to carry out preclinical research and development activities related to the Company's NLPR3 program.

The first tranche was due upon execution of the agreement and was received in March 2024, for $1.1 million. The Company notified PVB of a successful drug candidate nomination, the trigger for the second tranche of funding, in December 2024 and received payment of $1.5 million in January 2025.

The Company concluded the funding arrangement was an obligation to perform services and the funding received is recognized as a contra-R&D expense as project costs are incurred. $0.8 million of costs were incurred during the year ended December 31, 2024. Upon achievement of certain development, regulatory or commercial trigger events, the Company agreed to pay PRV in aggregate an amount equal to no more than four times the funding provided by PRV, i.e., a maximum repayment amount of up to £8.4 million. The trigger event payments meet the derivative scope exception under ASC 815 *Derivatives and Hedging,* and therefore do not need to be bifurcated and separately accounted for.

9. Stockholders' Equity

Preferred Stock

The Company's board of directors has the authority to issue up to 50,000,000 shares of preferred stock in one or more series with rights, preferences and privileges to be determined. There are no shares of preferred stock issued and outstanding as of December 31, 2024.

Common Stock

Common stock outstanding in the consolidated balance sheet and consolidated statement of convertible preferred stock and stockholders' equity as of December 31, 2024 includes 404,297 shares of restricted stock that vest based on service conditions and are subject to the Company's right of repurchase upon termination of services. Common stock reserved for future issuance consisted of the following:

	December 31, 2024 (in thousands)
Shares reserved for options and restricted stock units issued under the equity plans	15,814
Shares reserved for future issuance under the equity plans	19,714
Shares reserved for future issuance under the employee stock purchase plan	3,064
Total	38,592

In addition, the Company may be required to issue additional shares of its capital stock if certain milestone conditions are met pursuant to the contingent consideration associated with the Company's acquisitions of assets (see Note 6). In December 2023, 6,072,445 shares of common stock were issued related to BlackThorn Merger Agreement upon achievement of the Phase 3 navacaprant dosing milestone that was met in October 2023. As of December 31, 2024, no shares have been reserved for potential future issuances as no other BlackThorn Milestones have been achieved.

10. Stock-Based Compensation

Equity Plans

2023 Equity Incentive Plan

In September 2023, the Company adopted the 2023 Equity Incentive Plan (the 2023 Plan). The 2023 Plan provides for the grant of stock options, restricted stock awards, restricted stock unit awards, and other stock-based awards to employees, directors, and non-employee service providers of the Company. The 2023 Plan replaced the Company's 2020 Equity Incentive Plan (the "2020 Plan"). The Company no longer grants stock options or other awards under its 2020 Plan, but any stock options outstanding under the 2020 Plan remain outstanding and effective in accordance with their terms. Awards granted under the 2023 Plan expire no later than ten years from the date of grant. The price of stock options shall not be less than 100% of the estimated fair value on the date of grant and typically vest over a four-year period although may be granted with different vesting terms.

The 2023 Plan provides for an annual increase, to be added on the first day of each fiscal year, by up to 5% of the Company's outstanding shares of common stock as of the last day of the prior year. On January 1, 2024, the number of shares of common stock available for issuance under the 2023 Plan increased by 7,941,517 shares as a result of the automatic increase provision of the 2023 Plan.

2023 Employee Share Purchase Plan

In September 2023, the Company adopted the 2023 Employee Share Purchase Plan (the ESPP). The Company may hold one or more offering periods each year during which employees will be able to purchase shares under the 2023 ESPP through payroll deductions made over the term of the offering. The per-share purchase price at the end of each offering period is equal to the lesser of 85% of the closing price of the Company's common stock at the beginning or end of the offering period. On January 1, 2024, the number of shares of common stock available for issuance under the 2023 ESPP increased by 1,588,303 shares as a result of the automatic increase provision of the ESPP. The Company issued 51,704 shares during the year ended December 31, 2024.

Stock Option Activity

	Outstanding Stock Options	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
	(in thousands, except per share amounts and years)			
Outstanding as of December 31, 2023	13,783	$ 6.39	8.7	$ 146,966
Granted	3,710	16.10		
Exercised	(1,957)	3.82		
Canceled and forfeited	(1,472)	7.90		
Expired	(137)	3.62		
Outstanding as of December 31, 2024	13,927	$ 9.20	7.8	44,953
Exercisable as of December 31, 2024	5,252	$ 6.05	6.8	25,871

The stock option activity table above excludes options granted to purchase 446,068 shares of common stock that were originally granted with market conditions to one of the Company's executives.

The weighted-average fair value of stock options granted was $12.48, $7.77 and $3.77 per share for the years ended December 31, 2024, 2023 and 2022, respectively. The intrinsic value of stock options exercised was $16.7 million, $5.1 million and $1.3 million for the years ended December 31, 2024, 2023 and 2022, respectively. The aggregate grant-date fair value of options vested was $24.6 million, $9.1 million and $5.2 million for the years ended December 31, 2024, 2023 and 2022, respectively.

Fair Value of Stock Options

The fair value of stock options granted for employee and non-employee awards was estimated at the grant date using the Black-Scholes option pricing model based on the following assumptions:

	Year Ended December 31,		
	2024	2023	2023
		(in thousands)	
Expected volatility	91.6% - 97.9%	89.6% - 96.5%	87.2% - 91.1%
Expected term (years)	5.27 - 6.08	4.0 - 6.1	4.5 - 6.5
Risk-free interest rate	3.5% - 4.6%	3.4% - 4.9%	1.7% - 4.2%
Expected dividend yield	—	—	—

Expected volatility—As there is limited trading history for the Company's common stock, the Company has determined expected volatility based on the average historical stock price volatility of comparable publicly-traded companies and expects to continue to do so until such time as it has adequate historical data regarding the volatility of its own traded stock price. The comparable companies are chosen based on their similar size, stage in the life cycle or area of therapeutic focus. The historical volatility is calculated based on a period of time commensurate with the expected term assumption.

Expected term—The expected term of the Company's stock options has been estimated using the simplified method for awards that qualify as plain-vanilla stock options. The simplified method calculates the expected term as the average of the time-to-vesting and the contractual life of the stock options.

Risk-free interest rate—The risk-free interest rate assumption was based on 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.

Expected dividend yield—The expected dividend yield assumption is zero as the Company has never paid and has no plans to pay dividends on its common stock in the foreseeable future.

Early Exercise of Employee Stock Options

The Company's Plans allow for certain employees to exercise their stock options prior to vesting into shares of restricted common stock. The proceeds from early exercised stock options are recorded as liabilities in the consolidated balance sheets at the time of exercise and reclassified to common stock and additional paid-in capital as the underlying stock options vest and the Company's repurchase right lapses. As of December 31, 2024, the Company had issued 1,004,607 shares of restricted common stock upon the early exercise of unvested stock options, of which 848,164 shares had vested and 122,987 unvested shares had been repurchased, such that 33,456 shares or restricted stock remained outstanding and unvested.

Restricted Stock Activity

The Company's Plans allow for the grant of restricted common stock and restricted stock units to certain employees, executives, non-employee scientific advisors, and third-party service providers. The restrictions lapse over time primarily according to service-based vesting conditions of each award. In the event of a voluntary or involuntary termination of the holder's continuous provision of services to the Company, any unvested portion of the restricted stock award is automatically forfeited.

The following table summarizes the Company's restricted stock activity:

	Shares of Restricted Common Stock	Weighted-Average Grant Date Fair Value Per Share	Shares of Restricted Stock Units	Weighted-Average Grant Date Fair Value Per Share
	(in thousands, except per share amounts)			
Outstanding and unvested as of December 31, 2023	840	$ 6.11	353	$ 17.00
Granted	414	14.22	1,265	17.43
Vested	(620)	8.59	(88)	17.00
Forfeited and expired	—	—	—	—
Cancelled	(263)	6.41	(89)	18.07
Outstanding and unvested as of December 31, 2024	371	$ 10.82	1,441	$ 17.32

Awards with Performance Conditions with the Company's Scientific Advisors

In 2020, the Company approved grants of 892,136 shares of restricted common stock to certain of the Company's scientific advisors, which vest based on the achievement of performance conditions to be determined and continued service to the Company.

In April 2024, the Company amended the terms of two restricted stock purchase agreements of 127,448 shares each, with performance conditions that had never been set, such that they lapsed in their entirety and become fully vested and unrestricted effective April 1, 2024. The modifications were determined to be improbable-to-probable modifications which resulted in $3.6 million in total expense that was fully recognized during the three months ended June 30, 2024.

Also, in April 2024, the Company revised the vesting schedule for two other restricted stock purchase agreements each consisting of 79,656 shares. These agreements originally had performance condition tranches that had been set but were not probable of being met and were amended to instead vest monthly over three years, subject to continued service. The modification of the performance-based tranches were deemed to be improbable-to-probable modifications. Total compensation cost of $2.3 million, equal to the modification date fair value, will be recognized over the remaining service period.

Additionally, in 2020, the Company approved grants of 700,965 stock options to certain of the Company's scientific advisors, which vest based on the achievement of performance conditions and continued service to the Company. In December 2022 and January 2023, the Company's board of directors established performance conditions for 337,738 stock options and 63,724 stock options, respectively, such that the criteria for establishing a grant date, and accordingly a measurement date, were met for these performance stock options and the remaining 299,503 stock options with performance conditions to be established were cancelled in July 2023 because certain of the Company's scientific advisors were terminated.

As of December 31, 2024 the performance conditions for all restricted common stock and stock options were established, amended or cancelled.

Stock-Based Compensation

The following table summarizes total stock-based compensation included in the Company's consolidated statements of operations and comprehensive loss:

	Year Ended December 31,		
	2024	2023	2022
	(in thousands)		
Research and development	$ 17,662	$ 8,067	$ 4,252
General and administrative	22,328	9,173	4,046
Total stock-based compensation	$ 39,990	$ 17,240	$ 8,298

As of December 31, 2024, there was $70.3 million and $23.6 million of unrecognized stock-based compensation related to stock options and restricted stock outstanding, respectively, which were expected to be recognized over a weighted-average remaining service period of 2.1 years and 2.8 years, respectively.

11. Income Taxes

A reconciliation of the Company's federal income tax rate and effective income tax rate is summarized as follows:

	Year Ended December 31,		
	2024	2023	2022
	(in thousands)		
Federal income taxes	21.0 %	21.0 %	21.0 %
State income taxes, net of federal benefit	3.7	2.8	3.7
Milestone payments	—	(5.3)	—
Permanent differences	(0.1)	(0.3)	(0.5)
Research and development tax credits	6.4	1.9	1.8
Transaction costs	0.7	—	—
Executive compensation	(1.3)	(0.6)	—
Tax law change	(2.9)	3.6	—
State rate adjustment	—	0.5	2.2
Valuation allowance	(27.6)	(23.7)	(28.2)
Effective income tax rate	(0.1)%	(0.1)%	— %

Deferred tax assets and liabilities reflect the net tax effects of net operating loss and tax credit carryforwards and temporary differences between the carrying amount of assets and liabilities for financial reporting and the amounts used for tax purposes. Significant components of the Company's deferred tax assets and liabilities are summarized as follows:

	Year Ended December 31,	
	2024	2023
	(in thousands)	
Deferred tax assets:		
Net operating losses	$ 112,075	$ 79,117
Capitalized license agreements	34,699	41,032
Capitalized research and development expense	81,544	57,872
Research and development credits	28,716	12,981
Compensation related	6,887	5,942
Operating lease liabilities	465	1,429
Other	531	407
Total deferred tax assets	264,917	198,780
Less: valuation allowance	(264,379)	(197,280)
Total deferred tax assets less valuation allowance	538	1,500
Deferred tax liabilities:		
Operating lease right-of-use assets	(446)	(1,385)
Fixed assets	(92)	(115)
Total deferred tax liabilities	(538)	(1,500)
Net deferred tax assets	$ —	$ —

The Company determines its valuation allowance on deferred tax assets by considering both positive and negative evidence in order to ascertain whether it is more likely than not that deferred tax assets will be realized. Realization of deferred tax assets is dependent upon the generation of future taxable income, if any, the timing, and amount of which are uncertain. Due to the Company's recent history of operating losses, the Company believes that recognition of the deferred tax assets arising from the above-mentioned future tax benefits is currently not likely to be realized and, accordingly, has provided a valuation allowance on its deferred tax assets. The valuation allowance increased by $67.1 million and $55.7 million for the years ended December 31, 2024 and 2023, respectively, primarily due to the increase in the Company's net operating losses (NOL) during the periods and deferred tax assets related to capitalized research and development expenses.

NOLs and tax credit carryforwards as of December 31, 2024, were as follows (in thousands):

	Amount	Expiration Years
NOLs, federal (post-December 31, 2017)	$ 401,749	Indefinite (1)
NOLs, federal (pre-January 1, 2018)	40,370	2034 through 2036
NOLs, state	345,972	2034 thru 2044
Research and development tax credits, federal	27,262	2034 thru 2044
Research and development tax credits, California	6,334	Indefinite
Research and development tax credits, Massachusetts	1,237	2034 thru 2039

(1) NOL carryforward generated after 2017 which can be carried forward indefinitely and can generally be used to offset up to 80% of future taxable income

Utilization of the NOL carryforwards and research and development tax credit carryforwards may be subject to a substantial annual limitation under Section 382 of the Internal Revenue Code of 1986, as amended (Section 382) due to ownership changes that have occurred previously or that could occur in the future. These ownership changes may limit the amount of carryforwards that can be utilized annually to offset future taxable income. In general, an ownership change, as defined by Section 382, results from transactions increasing the ownership of certain stockholders or public groups in the stock of a corporation by more than 50% over a three-year period. The Company has not conducted a study to assess whether a change of control has occurred, including changes of control associated with the acquisitions of assets. Any limitation may result in expiration of a portion of the NOL carryforwards or research and development tax credit carryforwards before utilization; however, such limitation, if any, would not have an impact on the Company's financial statement due to the full valuation.

Uncertain Tax Positions

A reconciliation of the beginning and ending balance of total gross unrecognized tax benefits is as follows:

	December 31,		
	2024	2023	2022
	(in thousands)		
Beginning balance of unrecognized tax benefits	$ 8,664	$ 8,176	$ 7,821
Gross increase based on tax positions related to current year	1,805	391	355
Gross increase (decrease) based on tax positions related to prior years	(788)	97	—
Ending balance of unrecognized tax benefits	$ 9,681	$ 8,664	$ 8,176

The unrecognized tax benefits, if recognized, would not have an impact on the Company's effective tax rate assuming the Company continues to maintain a full valuation allowance position. As of December 31, 2024, no significant increases or decreases are expected to the Company's uncertain tax positions within the next twelve months.

The Company files income tax returns in the United States, and the states of California and Massachusetts. Due to net operating loss carryforwards, all years effectively remain open for income tax examination by tax authorities in the United States and states in which the Company files tax returns.

12. Net Loss Per Share

The following table summarizes the computation of basic and diluted net loss per share:

	Year Ended December 31,		
	2024	2023	2022
	(in thousands, except per share amounts)		
Numerator:			
Net loss	$ (243,787)	$ (235,925)	$ (130,904)
Denominator:			
Weighted-average common shares outstanding, basic and diluted	159,377	65,021	27,207
Net loss per share, basic and diluted	$ (1.53)	$ (3.63)	$ (4.81)

The following outstanding potentially dilutive common stock equivalents were excluded from the computation of diluted net loss per share for the periods presented because including them would have been antidilutive:

	December 31,		
	2024	2023	2022
		(in thousands)	
Convertible preferred stock	—	—	104,417
Common stock options and restricted stock units	15,814	14,582	8,570
Performance stock options (with performance conditions to be established)	—	—	363
Early exercised stock options subject to future vesting	33	64	532
Unvested restricted stock awards	371	840	2,902
Performance restricted stock (with performance conditions to be established)	—	255	510
Employee stock purchase plan	10	—	—
Total	16,228	15,741	117,294

13. Segment Reporting

Operating segments are defined as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker (CODM), or decision-making group, in making decisions on how to allocate resources and assess performance. The Company views its operations and manages its business in one operating segment related to the development of clinical and preclinical neuroscience programs that target novel mechanisms of action for a broad range of underserved neuropsychiatric disorders and neurodegenerative diseases. The Company's Chief Executive Officer (CEO) serves as the CODM.

The CEO manages and allocates resources to the operations of the Company on a consolidated basis. Managing and allocating resources on a consolidated basis enables the CEO to assess the overall level of resources available and how to best deploy these resources across functions and research and development projects that are in line with the Company's strategic goals. Consistent with this decision-making process, the CEO uses consolidated financial information for purposes of evaluating performance, cash forecasting, allocating resources and setting incentive targets. The CEO bases this assessment on the Company's consolidated net loss. Through this analysis, the CEO assesses performance by comparing budget to actual results, and then decides how to allocate resources to invest in the Company's research and development programs. The measure of segment assets is reported on the consolidated balance sheets as total assets.

The table below is a summary of the segment loss, including significant segment expenses (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Program expenses			
Navacaprant (NMRA-140) program	$ (105,442)	$ (37,929)	$ (9,685)
M4 PAM programs	(11,041)	(11,507)	(4,601)
NMRA-511 program	(7,236)	(6,588)	(860)
Preclinical programs	(5,776)	(10,622)	(11,597)
Research and development personnel-related costs	(47,036)	(36,789)	(27,445)
General and administrative expense	(62,537)	(45,475)	(31,121)
Acquired in-process research and development	—	(63,904)	(13,000)
Interest income	19,933	16,611	4,561
Other segment items[1]	(24,652)	(39,722)	(37,156)
Net loss	$ (243,787)	$ (235,925)	$ (130,904)

(1) Includes other research and development costs, provision for income taxes, and other income (expense)

14. Related Party Transactions

The Amgen Collaboration Agreement expired in September 2024. As of December 31, 2023, the Company was obligated to pay Amgen $3.1 million which was recorded within current liabilities and $6.3 million related to amounts prepayable to Amgen were recorded as prepaid expenses and other current assets on the condensed consolidated balance sheets. During the twelve months ended December 31, 2024, 2023, and 2022, the Company recorded $12.5 million, $24.4 million, and $25.1 million respectively, of research and development expenses with Amgen.

15. Defined Contribution Plan

The Company sponsors a 401(k) Plan whereby eligible employees can elect to contribute to the 401(k) Plan, subject to certain limitations, on a pretax basis. Effective from January 1, 2022, the Company commenced matching employee contributions at a rate of 50%, with a maximum matching employer contribution of up to 3% of employee contributions.

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

As of December 31, 2024, management, with the participation and supervision of our Chief Executive Officer and our Chief Financial Officer, have evaluated our disclosure controls and procedures as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act. Based on that evaluation, our Chief Executive Officer and our Chief Financial Officer have concluded that, as of December 31, 2024, our disclosure controls and procedures were effective to provide reasonable assurance that information we are required to disclose in reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in SEC rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Management's Annual Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) under the Securities Exchange Act of 1934). Our internal control over financial reporting is a process designed under the supervision of our principal executive officer and principal financial officer to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our financial statements for external purposes in accordance with generally accepted accounting principles. Management evaluated the effectiveness of our internal control over financial reporting using the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control—Integrated Framework (the 2013 Framework). Management, under the supervision and with the participation of the principal executive officer and principal financial officer, assessed the effectiveness of our internal control over financial reporting as of December 31, 2024 and concluded that it was effective based on those criteria.

The effectiveness of our internal control over financial reporting as of December 31, 2024 has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in its report on our internal control over financial reporting, which is included in this Annual Report.

Changes in Internal Control over Financial Reporting

There are no changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) that occurred during the year ended December 31, 2024, that have materially affected, or are reasonably likely to materially affect, our internal control financial reporting.

Inherent Limitations on Effectiveness of Controls

The effectiveness of any system of internal control over financial reporting, including ours, is subject to inherent limitations, including the exercise of judgment in designing, implementing, operating, and evaluating the controls and procedures, and the inability to eliminate misconduct completely. Accordingly, any system of internal control over financial reporting, including ours, no matter how well designed and operated, can only provide reasonable, not absolute assurances. In addition, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. We intend to continue to monitor and upgrade our internal controls as necessary or appropriate for our business but cannot assure you that such improvements will be sufficient to provide us with effective internal control over financial reporting.

ITEM 9B. Other Information.

(a) Departure of Robert Lenz as Head of Research and Development

On March 3, 2025 (the "Separation Date"), Robert Lenz, M.D., Ph.D. departed the Company ceased serving as Head of Research and Development. In connection with Dr. Lenz's departure, on March 3, 2025, the Company and Dr. Lenz entered into a separation agreement (the "Separation Agreement") that will become effective as of March 11, 2025. Pursuant to the Separation Agreement, which includes a general release of claims, Dr. Lenz will continue to receive his base salary at the rate in effect immediately prior to his separation for a period of nine months and the continuation of his health coverage pursuant to COBRA at the Company's expense for a period of nine months following the Separation Date.

In connection with his departure, the Company and Dr. Lenz have also entered into a Master Services Agreement (the "Consulting Agreement"), effective as of the Separation Date, pursuant to which Dr. Lenz will provide consulting services for the Company's research and development programs, as requested from time to time by the Company. Dr. Lenz will be compensated for his services under the Consulting Agreement at a rate of $46,000 per month for the period ending July 3, 2025, and following July 3, 2025, at an hourly rate of $500 per hour within thirty days following the Company's receipt of an invoice from Dr. Lenz. The Company may terminate the Consulting Agreement upon thirty days' notice at any time and Dr. Lenz may terminate the Consulting Agreement at any time upon thirty days' notice, provided that Dr. Lenz may not terminate the Consulting Agreement prior to completion of all active statements of work.

The foregoing summary is not complete and is qualified in its entirety by the Separation Agreement and Consulting Agreement, copies of which the Company intends to file with the SEC as exhibits to the Company's Quarterly Report on Form 10-Q for the three months ending March 31, 2025.

(b) Trading Arrangements

The following table describes, for the three months ended December 31, 2024, each trading arrangement for the purchase or sale of Company securities adopted, modified or terminated by our directors and officers that is either (1) a contract, instruction or written plan intended to satisfy the affirmative defense conditions of Rule 10b5-1(c), or a Rule 10b5-1 trading arrangement, or (2) a "non-Rule 10b5-1 trading arrangement" (as defined in Item 408(c) of Regulation S-K):

			Trading Arrangement			
Name *(Title)*	**Action**	**Date**	**Rule 10b5-1***	**Non-Rule 10b5-1****	**Total Shares to be Sold**	**Expiration Date**
Carol Suh *(Former Chief Operating Officer)****	Adopt	December 6, 2024	X		123,698	March 6, 2025

* Intended to satisfy the affirmative defense of Rule 10b5-1(c)
** Not intended to satisfy the affirmative defense of Rule 10b5-1(c)
*** Carol Suh is no longer an executive officer as of February 14, 2025.

ITEM 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

None.

ITEM 10. Directors, Executive Officers and Corporate Governance.

Except as set forth below, the information required by this item is incorporated by reference to our definitive Proxy Statement to be filed with the SEC in connection with our 2025 Annual Meeting of Stockholders within 120 days after the end of the fiscal year ended December 31, 2024.

We have adopted a Code of Business Conduct and Ethics that applies to all of our directors, officers and employees, including our principal executive officer and principal financial officer. A current copy of the code is posted on the Investors Corporate Governance section of our website, which is located at www.neumoratx.com.

We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding an amendment to, or waiver from, a provision of this Code of Business Conduct and Ethics by posting such information on our website, at the address and location specified above and, to the extent required by the listing standards of The Nasdaq Global Market, by filing a Current Report on Form 8-K with the SEC, disclosing such information.

We have adopted an insider trading policy governing the purchase, sale and other dispositions of our securities by our directors, officers and employees that we believe is reasonably designed to promote compliance with insider trading laws, rules and regulations, and any applicable listing standards. A copy of our insider trading policy is filed as Exhibit 19 to this Annual Report on Form 10-K.

ITEM 11. Executive Compensation.

The information required by this item is incorporated by reference to our definitive Proxy Statement to be filed with the SEC in connection with our 2025 Annual Meeting of Stockholders within 120 days after the end of the fiscal year ended December 31, 2024.

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

The information required by this item is incorporated by reference to our definitive Proxy Statement to be filed with the SEC in connection with our 2025 Annual Meeting of Stockholders within 120 days after the end of the fiscal year ended December 31, 2024.

ITEM 13. Certain Relationships and Related Party Transactions, and Director Independence.

The information required by this item is incorporated by reference to our definitive Proxy Statement to be filed with the SEC in connection with our 2025 Annual Meeting of Stockholders within 120 days after the end of the fiscal year ended December 31, 2024.

ITEM 14. Principal Accountant Fees and Services.

The information required by this item is incorporated by reference to our definitive Proxy Statement to be filed with the SEC in connection with our 2025 Annual Meeting of Stockholders within 120 days after the end of the fiscal year ended December 31, 2024.

ITEM 15. Exhibits and Financial Schedules.

The following documents are filed as part of this Annual Report on Form 10-K:

a) Financial Statements. See Index to Financial Statements included in the consolidated financial statements in this Annual Report on Form 10-K.

b) Financial Statement Schedules. All financial statement schedules are omitted because they are not applicable or required, or the information required to be set forth therein is included in the consolidated financial statements or notes thereto included in the Index to Financial Statements of this Annual Report on Form 10-K.

c) Exhibits. The exhibits required to be filed as part of this Annual Report on Form 10-K are listed in the Exhibit List attached hereto and are incorporated herein by reference.

Exhibit Number	Description	Incorporated by Reference			Filed Herewith
		Form	Date	Number	
2.1†	Agreement and Plan of Merger, dated June 1, 2020, by and among the Registrant, Berries Merger Sub, Inc, BlackThorn Therapeutics, Inc. and Fortis Advisors LLC.	S-1	8/25/2023	2.1	
3.1	Amended and Restated Certificate of Incorporation, as amended, currently in effect.	8-K	9/19/2023	3.1	
3.2	Bylaws, as amended, currently in effect.	8-K	9/19/2023	3.2	
4.1	Reference is made to Exhibits 3.1 through 3.2				
4.2	Form of Common Stock Certificate.	S-1/A	9/11/2023	4.2	
10.1	Investors' Rights Agreement, dated September 22, 2022, by and among the Registrant and the investors listed therein.	S-1	8/25/2023	10.1	
10.2†	Exclusive License Agreement for CK1d, dated September 10, 2021, by and between the Registrant and Amgen Inc.	S-1	8/25/2023	10.3	
10.3(a)†	Exclusive License Agreement for GCase, dated September 10, 2021, by and between the Registrant and Amgen Inc.	S-1	8/25/2023	10.4(a)	
10.3(b)†	First Amendment to Exclusive License Agreement for GCase, dated June 14, 2022, by and between the Registrant and Amgen, Inc.	S-1	8/25/2023	10.4(b)	
10.4(a)†	License Agreement, dated November 23, 2015, by and between BlackThorn Therapeutics, Inc. and Scripps Research Institute.	S-1	8/25/2023	10.5(a)	
10.4(b)†	First Amendment to License Agreement, dated November 13, 2017, by and between BlackThorn Therapeutics, Inc. and Scripps Research Institute.	S-1	8/25/2023	10.5(b)	
10.4(c)†	Second Amendment to License Agreement, dated April 9, 2019, by and between BlackThorn Therapeutics, Inc. and Scripps Research Institute.	S-1	8/25/2023	10.5(c)	
10.5(a)#	BlackThorn Therapeutics, Inc. 2015 Equity Incentive Plan.	S-8	9/19/2023	99.1(a)	
10.5(b)#	Form of Stock Option Agreement under the BlackThorn Therapeutics, Inc. 2015 Equity Incentive Plan.	S-8	9/19/2023	99.1(b)	
10.6(a)#	2020 Equity Incentive Plan.	S-1	8/25/2023	10.6(a)	
10.6(b)#	Form of Stock Option Agreement under the 2020 Equity Incentive Plan.	S-1	8/25/2023	10.6(b)	
10.6(c)#	Form of Restricted Stock Purchase Agreement under the 2020 Equity Incentive Plan.	S-1	8/25/2023	10.6(c)	
10.7(a)#	2023 Incentive Award Plan.	S-8	9/19/2023	99.3(a)	
10.7(b)#	Form of Stock Option Grant Notice and Stock Option Agreement under the 2023 Incentive Award Plan.	S-1	8/25/2023	10.7(b)	
10.7(c)#	Form of Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement under the 2023 Incentive Award Plan.	S-1	8/25/2023	10.7(c)	
10.8#	Employee Stock Purchase Plan.	S-8	9/19/2023	99.4	
10.9#	Non-Employee Director Compensation Program.	S-1/A	9/11/2023	10.21	
10.10	Form of Indemnification and Advancement Agreement for directors and officers.	S-1/A	9/11/2023	10.13	
10.11(a)†	License Agreement, dated February 10, 2022, by and between the Registrant and Vanderbilt University.	S-1	8/25/2023	10.14(a)	
10.11(b)†	First Amendment to License Agreement, dated July 17, 2023, by and between the Registrant and Vanderbilt University.	S-1	8/25/2023	10.14(b)	
10.12#	Executive Employment Agreement, effective as of February 14, 2025, by and between the Registrant and Paul L. Berns.				X

10.13#	Executive Employment Agreement, dated as of June 2, 2023, by and between the Registrant and Henry O. Gosebruch.	S-1	8/25/2023	10.20	
10.14	Separation Agreement, dated February 15, 2025, by and between the Registrant and Henry O. Gosebruch.				X
10.15#	Executive Employment Agreement, dated as of November 13, 2023, by and between the Registrant and Jason Duncan.	10-K	3/7/2024	10.22	
10.16#	Executive Employment Agreement, dated as of January 1, 2023, by and between the Registrant and Carol Y. Suh.	10-K	3/7/2024	10.23	
10.17#	Executive Employment Agreement, dated as of February 14, 2025, by and between the Registrant and Michael Milligan.				X
10.18#	Executive Employment Agreement, dated as of February 14, 2025, by and between the Registrant and Joshua Pinto, Ph.D.				X
10.19#	Executive Employment Agreement, dated as of February 14, 2025, by and between the Registrant and Bill Aurora, Pharm.D.				X
10.20#	Executive Employment Agreement, dated as of August 31, 2023, by and between the Registrant and Robert Lenz, M.D., Ph.D.				X
10.21#	RBNC Therapeutics, Inc. Milestone Carveout Plan	10-Q	5/7/2024	10.2	
19.1	Insider Trading Policy				X
23.1	Consent of Independent Registered Public Accounting Firm				X
24.1	Power of Attorney (included on signature page)				X
31.1	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				X
31.2	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				X
32.1+	Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				X
32.2+	Certification of Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				X
97.1	Clawback Policy	10-K	3/7/2024	97.1	
101.INS	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because XBRL tags are embedded within the Inline XBRL document				X
101.SCH	Inline XBRL Taxonomy Extension Schema With Embedded Linkbase Documents				X
104	Cover Page Interactive Data File (embedded within the Inline XBRL document)				X

† Portions of the exhibit, marked by brackets, have been omitted because the omitted information (i) is not material and (ii) is the type of information that the registrant both customarily and actually treats as private and confidential.

# Indicates management contract or compensatory plan.

+ This certification accompanies the Annual Report pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 and shall not be deemed "filed" by the Registrant for purposes of Section 18 of the Securities Exchange Act of 1934, as amended.

ITEM 16. Form 10-K Summary.

None.

SIGNATURES

Pursuant to the requirements 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.

	Neumora Therapeutics, Inc.
Date: March 3, 2025	By: /s/ Paul L. Berns
	Name: Paul L. Berns
	Title: Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Henry O. Gosebruch and Joshua Pinto, Ph.D., and each of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, 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-in-fact and agents, 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 he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their or his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Name	Title	Date
/s/ Paul L. Berns Paul L. Berns	Chief Executive Officer (Principal Executive Officer)	March 3, 2025
/s/ Joshua Pinto, Ph.D. Joshua Pinto, Ph.D.	President	March 3, 2025
/s/ Michael Milligan Michael Milligan	Chief Financial Officer (Principal Financial and Accounting Officer)	March 3, 2025
/s/ Kristina M. Burow Kristina M. Burow	Director	March 3, 2025
/s/ Matthew K. Fust Matthew K. Fust	Director	March 3, 2025
/s/ Alaa Halawa Alaa Halawa	Director	March 3, 2025
/s/ Maykin Ho, Ph.D. Maykin Ho, Ph.D.	Director	March 3, 2025
/s/ David Piacquad David Piacquad	Director	March 3, 2025