

The information in this preliminary prospectus supplement is not complete and may be changed. This preliminary prospectus supplement and the accompanying prospectus are not an offer to sell and are not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED JUNE 30, 2026

PRELIMINARY PROSPECTUS SUPPLEMENT
(To Prospectus dated April 4, 2025)



Neurogene Inc.
Shares of Common Stock
Pre-Funded Warrants to Purchase Shares of Common Stock

We are offering _____ shares of our common stock and, in lieu of the shares of common stock to certain investors that so choose, pre-funded warrants to purchase _____ shares of our common stock. The purchase price of each pre-funded warrant will equal the price per share at which shares of our common stock are being sold to the public in this offering, minus \$0.000001 per share of common stock, the exercise price of each pre-funded warrant. The public offering price for each share of common stock is \$ _____. We are also offering the shares of our common stock that are issuable from time to time upon exercise of the pre-funded warrants. Our common stock trades on The Nasdaq Global Market (“Nasdaq”) under the symbol “NGNE.” On June 29, 2026, the last reported sale price for our common stock on Nasdaq was \$32.28 per share.

There is no established public trading market for the pre-funded warrants, and we do not expect a market to develop. We do not intend to apply for listing of the pre-funded warrants on Nasdaq or any securities exchange or nationally recognized trading system. Without an active trading market, the liquidity of the pre-funded warrants will be limited.

An investment in our securities involves a high degree of risk. You should carefully consider the information under the heading “[Risk Factors](#)” beginning on page [S-8](#) of this prospectus supplement, and under similar headings in the documents that are incorporated by reference into this prospectus supplement and the accompanying prospectus. We are a “smaller reporting company” as defined by Rule 12b-2 of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and are subject to reduced public company reporting requirements.

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

	PER SHARE	PER PRE-FUNDED WARRANT	TOTAL
Public Offering Price	\$ _____	\$ _____	\$ _____
Underwriting Discounts and Commissions ⁽¹⁾	\$ _____	\$ _____	\$ _____
Proceeds, Before Expenses, to Neurogene Inc.	\$ _____	\$ _____	\$ _____

⁽¹⁾ See the section titled “[Underwriting](#)” for additional information regarding underwriting compensation.

Delivery of the shares of common stock and pre-funded warrants is expected to be made on or about _____, 2026.

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

Joint Bookrunning Managers

Leerink Partners

Stifel

Guggenheim Securities

LifeSci Capital

William Blair

The date of this prospectus supplement is _____, 2026

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ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus relate to this offering. Before buying any of the securities that we are offering, we urge you to carefully read this prospectus supplement, the accompanying prospectus and any free writing prospectus, together with the information incorporated by reference as described under the headings “Where You Can Find More Information” and “Incorporation by Reference” in this prospectus supplement. These documents contain important information that you should consider when making your investment decision. Unless the context otherwise requires, references in this prospectus supplement to “Neurogene,” “Company,” “we,” “us,” “our,” and “ours” refer to Neurogene Inc.

This document is in two parts. The first part is this prospectus supplement, which describes the terms of this offering of securities and also adds to, updates and changes information contained in the accompanying prospectus and the documents incorporated by reference. The second part is the accompanying prospectus, which gives more general information. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. To the extent the information contained in this prospectus supplement differs from or conflicts with the information contained in the accompanying prospectus or any document incorporated by reference, the information in this prospectus supplement will control. If any statement in one of these documents is inconsistent with a statement in another document having a later date—for example, a document incorporated by reference into this prospectus supplement and the accompanying prospectus—the statement in the document having the later date modifies or supersedes the earlier statement.

We have not, and the underwriters have not, authorized anyone to provide you with information different from that which is contained in or incorporated by reference in this prospectus supplement, the accompanying prospectus and in any free writing prospectus that we may authorize for use in connection with this offering. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give to you. We are not, and the underwriters are not, making offers to sell or seeking offers to buy these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information contained in this prospectus supplement, the accompanying prospectus or any free writing prospectus is accurate only as of its date and that any information we have incorporated by reference or included in the accompanying prospectus is accurate only as of the date given in the document incorporated by reference or as of the date of the prospectus, as applicable, regardless of the time of delivery of this prospectus supplement, the accompanying prospectus, any related free writing prospectus, or any sale of our securities. Our business, financial condition, results of operations and prospects may have changed since those dates.

We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to any document that is incorporated by reference into this prospectus supplement or the accompanying prospectus were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

For investors outside the United States: we have not, and the underwriters have not, done anything that would permit this offering, or possession or distribution of this prospectus supplement and the accompanying prospectus, in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus supplement and the accompanying prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of our common stock and the distribution of this prospectus supplement and the accompanying prospectus outside of the United States. This prospectus supplement and the accompanying prospectus do not constitute, and may not be used in connection with, an offer to sell, or a solicitation of an offer to buy, any securities offered by this prospectus supplement and the accompanying prospectus by any person in any jurisdiction in which it is unlawful for such person to make such an offer or solicitation.

CAUTIONARY STATEMENT CONCERNING FORWARD-LOOKING STATEMENTS

We make “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Exchange Act in this prospectus supplement and the accompanying prospectus, including the documents that we incorporate by reference herein and therein. These forward-looking statements can generally be identified as such because the context of the statement will include words such as “may,” “will,” “intend,” “plan,” “believe,” “anticipate,” “expect,” “estimate,” “predict,” “potential,” “continue,” “likely,” “target,” “forecast,” or “opportunity,” the negative of these words or other similar words. Similarly, statements that describe our plans, strategies, intentions, expectations, objectives, goals or prospects and other statements that are not historical facts are also forward-looking statements. For such statements, we claim the protection of the Private Securities Litigation Reform Act of 1995. Readers of this prospectus supplement are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the time this prospectus supplement was filed with the SEC. These forward-looking statements are based largely on our expectations and projections about future events and future trends affecting our business and are subject to risks and uncertainties that could cause actual results to differ materially from those anticipated in the forward-looking statements. These risks and uncertainties include:

- We have a limited operating history, have not completed any clinical trials, and have no products approved for commercial sale, and our results may vary from quarter to quarter.
- We will require substantial additional capital to finance our operations in the future. If we are unable to raise such capital when needed, or on acceptable terms, we may be forced to delay, reduce or eliminate clinical trials, product development programs or future commercialization efforts.
- We have incurred significant losses since inception, and expect to incur significant losses for the foreseeable future and may not be able to achieve or sustain profitability in the future. We have no products for sale, have not generated any product revenue and may never generate product revenue or become profitable.
- We are substantially dependent on the success of our most advanced product candidate, NGN-401, and our ongoing clinical trial of NGN-401 may not be successful.
- NGN-401 is in clinical development and our other programs are in early stages of development and may fail in development or suffer delays that materially and adversely affect their commercial viability. If we are unable to complete development of, or commercialize, our product candidates, or experience significant delays in doing so, our business will be materially harmed.
- Delays in developing our manufacturing capabilities or failure to achieve operating efficiencies from such capabilities may require us to devote additional resources and management time to manufacturing operations and may delay our product development timelines.
- We have a number of academic collaborations, and currently rely on our collaboration with the University of Edinburgh for certain aspects of our preclinical research and development programs, including working in collaboration to discover and preclinically develop potential product candidates for our near-term future pipeline. Failure or delay of the University of Edinburgh or any other collaborator to fulfil all or part of its obligations under our agreements, a breakdown in collaboration between the parties or a complete or partial loss of the relationship would materially harm our business.
- In order to successfully implement our plans and strategies, we will need to grow the size of our organization and we may experience difficulties in managing this growth.
- The regulatory approval processes of the U.S. Food and Drug Administration and other comparable foreign regulatory authorities are lengthy, time-consuming and inherently unpredictable. If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals for our product candidates, we will not be able to commercialize, or will be delayed in commercializing, such product candidates, and our ability to generate revenue will be materially impaired.

- Because gene therapy is novel and the regulatory landscape that governs any product candidates we may develop is rigorous, complex, uncertain and subject to change, we cannot predict the time and cost of obtaining regulatory approval, if received at all, for any product candidate we may develop.
- The market price of our common stock may continue to be volatile.
- We may be required to allocate resources to fulfilling the requirements of the Contingent Value Rights Agreement entered into in connection with the Reverse Merger (as defined below) related to certain legacy lease obligations, which may take away from our core programs and create a distraction for our management and employees.
- Future sales of a substantial number of shares of our stock could cause our stock price to decline.
- Our executive officers, directors and principal stockholders have the ability to control or significantly influence all matters submitted to our stockholders for approval.
- Our expected use of proceeds from this offering.
- The other risk factors discussed in the section titled “Risk Factors” in this prospectus supplement, the accompanying prospectus and the risk factors and cautionary statements described in other documents that we file from time to time with the SEC, specifically under “Risk Factors” and elsewhere in our most recent Annual Report on Form 10-K (our “Annual Report”) and subsequent Quarterly Reports on Form 10-Q (“Quarterly Reports”).

Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future.

Any forward-looking statements in this prospectus supplement reflect our current views with respect to future events or to our future financial performance and involve known and unknown risks, uncertainties, and other factors that may cause our actual results, performance, or achievements to be materially different from any future results, performance, or achievements expressed or implied by these forward-looking statements.

This prospectus supplement also contains or incorporates by reference estimates, projections, and other information concerning our industry, our business, and the markets for certain diseases, including data regarding the estimated size of those markets, and the incidence and prevalence of certain medical conditions. Information that is based on estimates, forecasts, projections, market research, or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances reflected in this information. Unless otherwise expressly stated, we obtained this industry, business, market, and other data from reports, research surveys, studies, and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data, and similar sources.

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 prospectus supplement 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.

PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights certain information about us and this offering and selected information contained elsewhere in or incorporated by reference into this prospectus supplement and the accompanying prospectus. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our securities. For a more complete understanding of our company and this offering, we encourage you to read and consider carefully the more detailed information in this prospectus supplement and the accompanying prospectus, including the information incorporated by reference into this prospectus supplement and the accompanying prospectus, and the information included in any free writing prospectus that we authorize for use in connection with this offering, including the information contained in and incorporated by reference under the heading “Risk Factors” beginning on page [S-8](#) of this prospectus supplement, and under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus supplement and the accompanying prospectus.

Overview

We are a clinical-stage biotechnology company committed to overcoming the limitations of conventional gene therapy and turning today’s complex, devastating neurological diseases into treatable conditions. We are building a robust and differentiated product portfolio of genetic medicines for rare neurological diseases with high unmet need not otherwise addressable by conventional gene therapy. One approach we are taking harnesses our proprietary transgene regulation technology, EXACT™ (Expression Attenuation via Construct Tuning), that utilizes microRNA-based genetic circuits designed to deliver therapeutic levels of transgene to key areas of the brain that underlie neurological disease pathology.

Our first clinical-stage program, NGN-401, is in development for the treatment of Rett syndrome, a severe and progressive neurodevelopmental disease with substantial neurological and physical impairments and significant unmet need. NGN-401 is purposefully designed to utilize the EXACT platform and adeno-associated virus delivery via intracerebroventricular administration, and to deliver the full-length *MECP2* gene which preserves the complete set of endogenous regulatory elements to restore functional MeCP2 protein. Our ongoing registrational trial of NGN-401, Embolden™, is a single-arm, open-label, baseline-controlled trial evaluating the 1E15 vg dose of NGN-401 in females with Rett syndrome. The Embolden trial is designed to evaluate NGN-401 in females ages three and above with potential to support a broad label in a single study and enable an efficient path to market. On June 8, 2026, we announced that we completed dosing in Embolden, with 25 participants receiving the 1E15 vg dose. We completed dosing in a Phase 1/2 open-label, multi-center clinical trial of NGN-401 gene therapy for Rett syndrome, with ten participants receiving the 1E15 vg dose.

Corporate Information

On December 18, 2023, we completed our business combination (the “Reverse Merger”) with Neurogene Inc., a Nevada corporation (“Neurogene OpCo”). In connection with the completion of the Reverse Merger, the Company changed its name from “Neoleukin Therapeutics, Inc.” to “Neurogene Inc.,” and the business conducted by the Company became primarily the business conducted by Neurogene OpCo.

Our principal executive offices are located at 535 W 24th St., 5th Floor, New York, NY 10011 and our telephone number is (855) 508-3568. Our website is www.neurogene.com. Information contained on or accessible through our website is not a part of this prospectus supplement, and the inclusion of our website address in this prospectus supplement is an inactive textual reference only.

Implications of Being a Smaller Reporting Company

We are a “smaller reporting company,” meaning that the market value of our common stock held by non-affiliates is less than \$700.0 million and our annual revenue is less than \$100.0 million during the most recently completed fiscal year. We will continue to be a smaller reporting company so long as either (i) the market value of our common stock held by non-affiliates is less than \$250.0 million or (ii) our annual revenue is less than \$100.0 million during the most recently completed fiscal year and the market value of our common stock held by non-affiliates is less than \$700.0 million. As a smaller reporting company, we may choose to present only the two most

recent fiscal years of audited financial statements in our Annual Report and smaller reporting companies have reduced disclosure obligations regarding executive compensation.

THE OFFERING

Common stock offered by us	shares.
Pre-funded warrants offered by us	We are also offering, in lieu of common stock to certain investors that so choose, pre-funded warrants to purchase _____ shares of our common stock. The purchase price of each pre-funded warrant equals the price per share at which the shares of our common stock are being sold to the public in this offering, minus \$0.000001 per share of common stock, which is the exercise price of each pre-funded warrant. Each pre-funded warrant will be exercisable at any time after the date of issuance of such pre-funded warrant, subject to an ownership limitation. See the section titled “Description of Securities” for additional information. This prospectus supplement also relates to the offering of the shares of our common stock issuable upon exercise of the pre-funded warrants.
Option to purchase additional shares of common stock	The underwriters have a 30-day option to purchase up to _____ additional shares of our common stock at the public offering price, less underwriting discounts and commissions.
Total common stock to be outstanding immediately after this offering	_____ shares, or _____ shares if the underwriters exercise their option to purchase additional shares of our common stock in full, assuming no exercise of the pre-funded warrants offered and sold in this offering.
Use of Proceeds	We estimate that our net proceeds from this offering will be approximately \$ _____ million (or approximately \$ _____ million if the underwriters exercise in full their option to purchase additional shares of our common stock), based on the public offering price of \$ _____ per share, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. We intend to use the net proceeds of this offering, together with our existing cash, cash equivalents and short-term investments, to fund the ongoing clinical development of NGN-401, pre-commercial activities for NGN-401 and for working capital and other general corporate purposes. See “Use of Proceeds” on page S-11 of this prospectus supplement.
Risk Factors	Investing in our common stock involves a high degree of risk. See the information contained in or incorporated by reference under the heading “ Risk Factors ” on page S-8 of this prospectus supplement, in the accompanying prospectus and in the documents incorporated by reference into this prospectus supplement and any free writing prospectus that we authorize for use in connection with this offering.
Nasdaq symbol	“NGNE.” There is no established public trading market for the pre-funded warrants, and we do not intend to apply for listing of the pre-funded warrants on Nasdaq or any securities exchange or nationally recognized trading system.

The number of shares of our common stock to be outstanding after this offering is based on 15,615,786 shares of our common stock outstanding as of March 31, 2026 and excludes:

- 2,820,038 shares of common stock issuable upon the exercise of outstanding stock options as of March 31, 2026 at a weighted-average exercise price of \$22.02 per share;

- 296,578 shares of common stock issuable upon the vesting of restricted stock units outstanding as of March 31, 2026;
- 252,124 shares of common stock issuable upon the vesting of performance stock units outstanding as of March 31, 2026;
- 1,301,337 shares of common stock reserved for issuance pursuant to future equity awards under our 2023 Equity Incentive Plan as of March 31, 2026, as well as any shares reserved pursuant to provisions in this plan that automatically increase the number of shares of our common stock reserved for future issuance under this plan;
- 362,460 shares of common stock reserved for issuance under our 2025 Inducement Plan as of March 31, 2026;
- 208,750 shares of our common stock issuable upon the exercise of stock options issued subsequent to March 31, 2026 under our 2025 Inducement Plan at a weighted-average exercise price of \$26.02 per share, and subsequent decrease in the number of shares of common stock reserved for issuance under our 2025 Inducement Plan;
- 535,911 shares of common stock reserved for issuance under our 2023 Employee Stock Purchase Plan as of March 31, 2026, as well as any shares reserved pursuant to provisions in this plan that automatically increase the number of shares of common stock reserved for future issuance under this plan;
- 3,959,954 shares of our common stock issuable upon exercise of outstanding pre-funded warrants at an exercise price of \$0.000001 per share (which do not expire), as of March 31, 2026; and
- 2,832,605 shares of our common stock issuable upon exercise of outstanding pre-funded warrants at an exercise price of \$0.001 per share (which do not expire), as of March 31, 2026.

Except as otherwise indicated, all information in this prospectus supplement assumes:

- no exercise of outstanding options and no vesting of restricted stock units, performance stock units, or restricted common stock awards after March 31, 2026;
- no exercise of the pre-funded warrants offered and sold in this offering; and
- no exercise of the underwriters' option to purchase additional shares of our common stock.

In addition, the number of shares of our common stock to be outstanding after this offering as shown above does not include the \$119.0 million in shares of common stock that remain available for future sales as of March 31, 2026 under our sales agreement with Leerink Partners LLC, dated as of August 11, 2025 (the "Sales Agreement"), pursuant to which we may offer and sell up to \$150.0 million in shares of common stock, from time to time, in "at the market" offerings. Between March 31, 2026 and the date of this prospectus supplement, we have sold 209,529 shares of our common stock under the Sales Agreement. We have agreed not to make any sales under the Sales Agreement until the earlier of (i) the exercise in full by the underwriters of their option to purchase additional shares of our common stock and (ii) 30 calendar days after the date of this prospectus supplement. For more information, see the section titled "Underwriting."

RISK FACTORS

Investing in our securities involves risks. Before making an investment decision, you should carefully consider the risks and other information we include or incorporate by reference in this prospectus supplement and the accompanying prospectus, and in any free writing prospectus that we have authorized for use in connection with this offering. In particular, you should consider the risk factors described under the heading “Risk Factors” in our Annual Report, as may be revised or supplemented by our subsequent Quarterly Reports or Current Reports on Form 8-K, each of which are on file with the SEC and are incorporated herein by reference, and which may be amended, supplemented or superseded from time to time by other reports we file with the SEC in the future. In addition to those risk factors, there may be additional risks and uncertainties which are not currently known to us or that we currently deem immaterial. Our business, financial condition or results of operations could be materially adversely affected by any of these risks. The occurrence of any of these risks might cause you to lose all or part of your investment in the offered securities.

Risks Related to This Offering

The price of our stock may be volatile, and you could lose all or part of your investment.

The trading price of our common stock has fluctuated, and is likely to continue to fluctuate substantially in response to various factors, some of which are beyond our control, including the factors discussed in this “Risk Factors” section and elsewhere in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein. The realization of any of these factors could have a dramatic and adverse impact on the market price of our common stock.

In addition, the stock market in general, and the market for biotechnology and biopharmaceutical companies in particular, have historically been particularly volatile and 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. If the market price of our common stock does not exceed the price at which you purchase your shares, you may not realize any return on your investment in us and may lose some or all of your investment. In the past, securities class action litigation has often been instituted against companies following periods of volatility in the market price of a company’s securities. This type of litigation, if instituted, could result in substantial costs and a diversion of management’s attention and resources, which would materially adversely affect our business, financial condition and results of operations.

If you purchase shares of our common stock in this offering, or pre-funded warrants in lieu thereof, you will incur immediate and substantial dilution and may experience additional dilution in the future.

You will suffer immediate and substantial dilution with respect to the common stock or the shares of common stock underlying the pre-funded warrants you purchase in this offering. If you purchase common stock (or pre-funded warrants in lieu thereof) in this offering at the public offering price of \$ per share (or \$ per pre-funded warrant in lieu thereof), and assuming that the underwriters do not exercise their option to purchase additional shares of common stock in this offering, you will incur immediate and substantial dilution of \$ per share, representing the difference between the public offering price of \$ per share and our pro forma net tangible book value per share as of March 31, 2026. See the section titled “Dilution” for a more detailed description of the dilution to new investors in this offering. In addition, to the extent that the pre-funded warrants issued in this offering are exercised, stock options are exercised, restricted stock units vest and settle or we raise additional funds by issuing equity securities, you will experience further dilution.

There is no public market for the pre-funded warrants being offered in this offering.

There is no established public trading market for the pre-funded warrants being offered in this offering, and we do not expect a market to develop. In addition, we do not intend to apply to list these pre-funded warrants on any securities exchange or nationally recognized trading system, including Nasdaq. Without an active market, the liquidity of these pre-funded warrants will be limited.

Holders of pre-funded warrants purchased in this offering will have no rights as common stockholders until such holders exercise their pre-funded warrants and acquire our common stock.

Until holders of the pre-funded warrants acquire shares of our common stock upon exercise of such pre-funded warrants, the holders will have no rights with respect to the shares of our common stock underlying such pre-funded warrants, such as voting rights or the rights to receive dividends. Upon exercise of the pre-funded warrants, the holders will be entitled to exercise the rights of a common stockholder only as to matters for which the record date occurs after the exercise.

We will not receive significant additional funds upon the exercise of the pre-funded warrants being offered.

In certain limited circumstances, each pre-funded warrant may be exercised by way of a cashless exercise, meaning that the holder may not pay a cash purchase price upon exercise, but instead would receive upon such exercise the net number of shares of our common stock determined according to the formula set forth in the pre-funded warrant. Accordingly, we may not receive any additional funds upon the cashless exercise of the pre-funded warrants or if the pre-funded warrants altogether are not exercised at all. In addition, the pre-funded warrants have an exercise price of \$0.000001 per share of common stock, and as a result we will not receive significant additional funds upon their exercise even if not a cashless exercise.

Significant holders or beneficial owners of our common stock may not be permitted to exercise pre-funded warrants that they hold.

Holders of the pre-funded warrants will not be entitled to exercise any portion of any pre-funded warrant which, upon giving effect to such exercise, would cause the aggregate number of shares of our common stock beneficially owned by the holder (together with its affiliates) to exceed a specified percentage of the number of shares of our common stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the pre-funded warrants. As a result, you may not be able to exercise your pre-funded warrants for shares of our common stock at a time when it would be financially beneficial for you to do so. In such circumstance you could seek to sell your pre-funded warrants to realize value, but you may be unable to do so in the absence of an established trading market for the pre-funded warrants.

If we do not maintain a current and effective registration statement relating to the shares of common stock issuable upon exercise of the pre-funded warrants, holders will only be able to exercise such pre-funded warrants on a “cashless basis.”

If we do not maintain a current and effective registration statement relating to the shares of common stock issuable upon exercise of the pre-funded warrants at the time that holders wish to exercise such pre-funded warrants, they will only be able to exercise them on a “cashless basis,” provided that an exemption from registration is available. As a result, the number of shares of common stock that holders will receive upon exercise of the pre-funded warrants will be fewer than it would have been had such holder exercised his or her warrant for cash, and holders may be limited in their ability to immediately sell shares upon exercise, subject to volume or other securities law limitations. Further, if an exemption from registration is not available, holders would not be able to exercise on a cashless basis and would only be able to exercise their pre-funded warrants for cash if a current and effective registration statement relating to the shares of common stock issuable upon exercise of the pre-funded warrants is available.

A sale of a substantial number of shares of our common stock, including any shares issuable upon exercise of any pre-funded warrants, may cause the price of our common stock to decline.

We cannot predict what effect, if any, future sales of our shares in the public market or the availability of shares for sale will have on the market price of our common stock. However, future sales of substantial amounts of our common stock in the public market, including shares issued upon exercise of any pre-funded warrants issued in this offering or option awards or upon settlement of restricted stock units or shares sold pursuant to the Sales Agreement, or the perception that such sales may occur, could adversely affect the market price of our common stock. We also expect that significant additional capital will be needed in the future to continue our planned operations. To raise capital, we may sell common stock, convertible securities, or other equity securities in one or more transactions at

prices and in a manner we determine from time to time. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock.

Participation in this offering by certain of our existing stockholders and their affiliated entities may reduce the public float for our common stock.

If any of our existing stockholders and their affiliated entities purchase shares of our common stock in this offering, such purchases would reduce the available public float of our common stock because such purchasers would be restricted from selling such shares during the 60-day period following this offering and thereafter would be subject to volume limitations pursuant to restrictions under applicable securities laws. As a result, any purchase of shares of our common stock by our existing stockholders and their affiliated entities in this offering will reduce the liquidity of our common stock relative to what it would have been had these shares been purchased by investors that were not our stockholders.

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

Our management will have broad discretion in the application of the net proceeds from this offering, including for the purposes described in the section titled “Use of Proceeds,” and you will be relying on the judgment of our management regarding the application of these proceeds. You will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. Our management might not apply the proceeds in ways that ultimately increase or maintain the value of your investment. If we do not invest or apply the proceeds from this offering in ways that enhance stockholder value, we may fail to achieve expected financial results, which could cause our stock price to decline.

USE OF PROCEEDS

We estimate that we will receive net proceeds of approximately \$ million (or approximately \$ million if the underwriters' option to purchase additional shares is exercised in full) from the sale of the shares of common stock and pre-funded warrants offered by us in this offering, based on the public offering price of \$ per share of common stock and \$ per pre-funded warrant (which equals the price per share at which the shares of our common stock are being sold to the public in this offering, minus \$0.000001 per share of common stock), after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, and excluding the proceeds, if any, from the exercise of the pre-funded warrants sold in this offering.

We intend to use the net proceeds of this offering, together with our existing cash, cash equivalents and short-term investments, to fund the ongoing clinical development of NGN-401, pre-commercial activities for NGN-401 and for working capital and other general corporate purposes.

Our expected use of proceeds from this offering represents our current intentions based on our present plans and business condition. As of the date of this prospectus supplement, we cannot predict with certainty all of the particular uses for the proceeds to be received upon the completion of this offering or the amounts that we will actually spend on the uses set forth above. We may also use a portion of the proceeds to license, acquire or invest in complementary businesses, technology, products or assets. However, we have no current commitments to do so. The amount and timing of our actual expenditures will depend on numerous factors. As a result, our management will have broad discretion over the use of the proceeds from this offering.

Based on our current operating plan, we estimate that the net proceeds from this offering, together with our existing cash, cash equivalents and short-term investments as of the date of this prospectus supplement, will be sufficient to enable us to fund our operating expenses and capital expenditure requirements into the third quarter of 2028. We have based this estimate on assumptions that may prove to be incorrect, and we could use our available capital resources sooner than we currently anticipate. Such amount may not be sufficient for us to fund our programs through regulatory approval and commercialization, and we expect to need to raise substantial additional capital in order to do so. To obtain the capital necessary to fund our programs through regulatory approval and commercialization, we may need to enter into additional public or private equity offerings, debt financings, or collaborations and licensing arrangements, or seek out other sources of capital. We also may elect to raise additional capital opportunistically.

Pending the use of the proceeds from this offering, we may invest the proceeds in a variety of capital preservation investments, including interest-bearing, investment-grade securities, certificates of deposit or government securities.

DILUTION

If you invest in our common stock in this offering (or pre-funded warrants in lieu thereof), your ownership interest will be immediately diluted to the extent of the difference between the public offering price per share of our common stock (or pre-funded warrant in lieu thereof) and the pro forma net tangible book value per share of common stock immediately after this offering.

Our historical net tangible book value as of March 31, 2026 was \$237.8 million, or \$15.23 per share of common stock. Our historical net tangible book value is the amount of our total tangible assets less our total liabilities. Historical net tangible book value per share of common stock represents historical net tangible book value divided by an aggregate of 15,615,786 shares of our common stock outstanding as of March 31, 2026.

After giving effect to our issuance and sale of shares of our common stock and pre-funded warrants in this offering at the public offering price of \$ per share and \$ per pre-funded warrant (which equals the price per share at which the shares of our common stock are being sold to the public in this offering, minus \$0.000001 per share of common stock), and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma net tangible book value as of March 31, 2026 would have been \$ million, or \$ per share of common stock. This represents an immediate increase in pro forma net tangible book value per share of \$ to existing stockholders and immediate dilution of \$ in pro forma net tangible book value per share to new investors purchasing shares of common stock in this offering. Dilution per share to new investors is determined by subtracting pro forma net tangible book value per share of common stock after this offering from the public offering price per share paid by new investors. The following table illustrates this dilution on a per share basis:

Public offering price per share		\$
Net tangible book value per share as of March 31, 2026	\$	15.23
Increase in net tangible book value per share attributable to this offering	\$	
Pro forma net tangible book value per share immediately after this offering		\$
Dilution per share to new investors in this offering		\$

The dilution information discussed above assumes no exercise of the pre-funded warrants sold in this offering and is illustrative only. Investors who receive shares of our common stock upon the exercise of the pre-funded warrants offered hereby may experience additional dilution depending on our net tangible book value at the time of exercise.

If the underwriters exercise in full their option to purchase additional shares, our pro forma net tangible book value per share after this offering would be \$, representing an immediate increase in pro forma net tangible book value per share of \$ to existing stockholders and immediate dilution in pro forma net tangible book value per share of \$ to new investors purchasing shares of common stock in this offering at the public offering price of \$ per share, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The number of our shares of common stock outstanding after this offering is based on an aggregate of 15,615,786 shares of our common stock outstanding as of March 31, 2026, and excludes the following:

- 2,820,038 shares of common stock issuable upon the exercise of outstanding stock options as of March 31, 2026 at a weighted-average exercise price of \$22.02 per share;
- 296,578 shares of common stock issuable upon the vesting of restricted stock units outstanding as of March 31, 2026;
- 252,124 shares of common stock issuable upon the vesting of performance stock units outstanding as of March 31, 2026;

- 1,301,337 shares of common stock reserved for issuance pursuant to future equity awards under our 2023 Equity Incentive Plan as of March 31, 2026, as well as any shares reserved pursuant to provisions in this plan that automatically increase the number of shares of our common stock reserved for future issuance under this plan;
- 362,460 shares of common stock reserved for issuance under our 2025 Inducement Plan as of March 31, 2026;
- 208,750 shares of our common stock issuable upon the exercise of stock options issued subsequent to March 31, 2026 under our 2025 Inducement Plan at a weighted-average exercise price of \$26.02 per share, and subsequent decrease in the number of shares of common stock reserved for issuance under our 2025 Inducement Plan;
- 535,911 shares of common stock reserved for issuance under our 2023 Employee Stock Purchase Plan as of March 31, 2026, as well as any shares reserved pursuant to provisions in this plan that automatically increase the number of shares of common stock reserved for future issuance under this plan;
- 3,959,954 shares of our common stock issuable upon exercise of outstanding pre-funded warrants at an exercise price of \$0.000001 per share (which do not expire), as of March 31, 2026; and
- 2,832,605 shares of our common stock issuable upon exercise of outstanding pre-funded warrants at an exercise price of \$0.001 per share (which do not expire), as of March 31, 2026.

To the extent that options outstanding as of March 31, 2026 have been or are exercised, or other shares or securities convertible into or exercisable for common stock are issued, investors purchasing shares in this offering could experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations, even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

DESCRIPTION OF SECURITIES

Common Stock

We are offering shares of our common stock in this offering. See the section titled “Description of Securities” in the accompanying prospectus for more information regarding our shares of common stock.

Pre-Funded Warrants

The following is a summary of the material attributes and characteristics of the pre-funded warrants. The form of pre-funded warrant will be provided to the pre-funded warrant purchasers in this offering and will be filed as an exhibit to a Current Report on Form 8-K filed in connection with this offering and incorporated by reference into the registration statement of which this prospectus supplement forms a part. The following summary is subject in all respects to the provisions contained in the pre-funded warrants.

Pre-funded warrants will be issued in certificated form only.

Duration and Exercise Price. Each pre-funded warrant entitles the holder thereof to purchase shares of our common stock at an exercise price equal to \$0.000001 per share. Each pre-funded warrant will be exercisable at any time beginning on the date of issuance. The number of shares of our common stock issuable upon exercise of each pre-funded warrant is subject to adjustment in the event of stock dividends, stock splits, reorganizations or similar events affecting our common stock and the exercise price.

Exercisability. The holder of the pre-funded warrant may exercise the pre-funded warrant by delivering an exercise notice, completed and duly signed, and payment in cash of the exercise price for the number of shares of our common stock for which the pre-funded warrant is being exercised. The holder of the pre-funded warrant may also satisfy its obligation to pay the exercise price through a “cashless exercise,” in which the holder receives the net value of the pre-funded warrant in shares of common stock determined according to the formula set forth in the pre-funded warrant.

Upon a holder’s exercise of the pre-funded warrant, we will issue the shares of common stock to which the holder is entitled pursuant to such exercise within three trading days after the exercise date.

A holder of the pre-funded warrant will not be entitled to exercise any portion of such pre-funded warrant that, upon giving effect to such exercise, would cause the aggregate number of shares of our common stock beneficially owned by such holder (together with its affiliates and any other persons whose beneficial ownership of common stock would be aggregated with the holder for purposes of Section 13(d) of the Exchange Act) to exceed 9.99% (or 4.99% at the election of the holder) of the total number of then issued and outstanding shares of common stock, as such percentage ownership is determined in accordance with the terms of the pre-funded warrant and subject to such holder’s rights under the pre-funded warrant to increase or decrease such percentage to any other percentage not in excess of 19.99% upon at least 61 days’ prior notice from such holder to us.

Fundamental Transaction. In the event of any fundamental transaction, as described in the pre-funded warrants and generally including any merger with or into another entity, sale of all or substantially all of our assets, tender offer or exchange offer, or reclassification of our shares of common stock, then upon any subsequent exercise of a pre-funded warrant, the holder will have the right to receive as alternative consideration, for each share of common stock that would have been issuable upon such exercise immediately prior to the occurrence of such fundamental transaction, the number of shares of common stock of the successor or acquiring corporation of our company, if it is the surviving corporation, and any additional consideration receivable upon or as a result of such transaction by a holder of the number of shares of common stock for which the warrant is exercisable immediately prior to such event.

Transferability. Subject to applicable laws, a pre-funded warrant may be transferred at the option of the holder upon surrender of the pre-funded warrant to us together with the appropriate instruments of transfer and payment of funds sufficient to pay any transfer taxes (if applicable).

Exchange Listing. There is no trading market available for the pre-funded warrants on any securities exchange or nationally recognized trading system. We do not intend to list the pre-funded warrants on Nasdaq or any securities exchange or nationally recognized trading system.

We will initially serve as the warrant agent under the pre-funded warrants.

Right as a Stockholder. Except as otherwise provided in the pre-funded warrants or by virtue of such holder's ownership of shares of our common stock, the holders of the pre-funded warrants do not have the rights or privileges of holders of our common stock, including any voting rights, until they exercise their pre-funded warrants.

U.S. FEDERAL INCOME TAX CONSIDERATIONS

The following discussion is a summary of U.S. federal income tax considerations to U.S. Holders and Non-U.S. Holders (each as defined below) of the ownership and disposition of the common stock and pre-funded warrants issued pursuant to this offering. The discussion does not purport to be a complete analysis of all potential tax considerations. The considerations of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or non-U.S. tax laws, are not discussed. This discussion is based on the U.S. Internal Revenue Code of 1986, as amended (the “Code”), Treasury Regulations promulgated under the Code, judicial decisions and published rulings and administrative pronouncements of the U.S. Internal Revenue Service (the “IRS”), in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a holder of our common stock or pre-funded warrants. We have not sought and will not seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a contrary position to that discussed below regarding the tax considerations of the ownership and disposition of our common stock or pre-funded warrants.

This discussion is limited to holders that hold our common stock or pre-funded warrants as a “capital asset” within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax considerations relevant to such holder’s particular circumstances, including without limitation the alternative minimum tax and the effect of the Medicare contribution tax on net investment income. In addition, it does not address considerations relevant to holders who are subject to special rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the United States;
- persons holding our common stock or pre-funded warrants as part of a hedge, straddle or other risk-reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies, or other financial institutions;
- real estate investment trusts or regulated investment companies;
- brokers, dealers or traders in currencies or securities, or other persons that elect to use a mark-to-market method of accounting for their holdings in our common stock or pre-funded warrants;
- “controlled foreign corporations,” “passive foreign investment companies” and corporations that accumulate earnings to avoid U.S. federal income tax;
- partnerships or other entities or arrangements classified as partnerships or disregarded entities for U.S. federal income tax purposes (and investors therein), S corporations or other passthrough entities (including hybrid entities);
- tax-exempt organizations or governmental organizations;
- persons deemed to sell our common stock or pre-funded warrants under the constructive sale provisions of the Code;
- persons who hold or receive our common stock or pre-funded warrants pursuant to the exercise of any employee stock option or otherwise as compensation;
- tax-qualified retirement plans;
- persons that acquire our common stock or pre-funded warrants as compensation for services;
- persons that own, or have owned, actually or constructively, more than 5% of our common stock and/or pre-funded warrants; and

- pension plans or funds, or an entity that is wholly owned by a pension plan or fund, including “qualified foreign pension funds” as defined in Section 897(l)(2) of the Code and entities all of the interests of which are held by qualified foreign pension funds.

If an entity or arrangement classified as a partnership for U.S. federal income tax purposes holds our common stock or pre-funded warrants, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, each partnership and each partner in such partnership holding our common stock or pre-funded warrants is urged to consult its tax advisor regarding the U.S. federal income tax considerations to it of the ownership and disposition of our common stock or pre-funded warrants.

For purposes of this discussion, a “U.S. Holder” is any person that, for U.S. federal income tax purposes, is or is treated as any of the following:

- an individual who is a citizen or resident of the United States;
- a corporation or other entity treated as a corporation for U.S. federal income tax purposes, created in, or organized under the laws of the United States or any state thereof or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (i) is subject to the primary supervision of a U.S. court and the control of one or more “United States persons” (within the meaning of Section 7701(a)(30) of the Code), or (ii) has a valid election in effect to be treated as a U.S. person for U.S. federal income tax purposes.

For purposes of this discussion, a “Non-U.S. Holder” is any beneficial owner of our common stock or pre-funded warrants that is neither a U.S. Holder nor an entity or arrangement treated as a partnership or other entity or arrangement treated as a pass-through entity for U.S. federal income tax purposes.

THIS DISCUSSION IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT TAX ADVICE. EACH INVESTOR IS URGED TO CONSULT ITS TAX ADVISOR WITH RESPECT TO THE APPLICATION OF U.S. FEDERAL INCOME TAX LAWS TO ITS PARTICULAR SITUATION AS WELL AS ANY TAX CONSIDERATIONS OF THE OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK OR PRE-FUNDED WARRANTS ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

Treatment of Pre-Funded Warrants

Although it is not entirely free from doubt, because the exercise price of the pre-funded warrants is a nominal amount, the pre-funded warrants are generally expected to be treated as shares of our common stock for U.S. federal income tax purposes (and a holder is expected to be subject to the same tax considerations as if the holder held shares of our common stock as discussed below). Accordingly, no gain or loss should be recognized upon exercise of a pre-funded warrant, and the holding period of the shares of our common stock received upon exercise of a pre-funded warrant should include the holding period of the pre-funded warrant. Similarly, the tax basis of the pre-funded warrant should carry over to the shares of common stock received upon exercise, increased by the exercise price. Each U.S. Holder and Non-U.S. Holder is urged to consult its tax advisor regarding the U.S. federal income tax considerations to it of the ownership and disposition of the pre-funded warrants.

U.S. Holders

Distributions on Common Stock

We have no present intention to pay cash dividends on our common stock. However, if we do make distributions of cash or other property on our common stock (other than certain distributions of our common stock), those distributions will generally constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. If the

amount of such distributions exceeds our current and accumulated earnings and profits, such excess will generally constitute a non-taxable return of capital and will first be applied against and reduce, but not below zero, a U.S. Holder's adjusted tax basis in our common stock. Any excess will be treated as capital gain and will be treated as described below under the subsection titled "Sale or Other Taxable Disposition of Common Stock or Pre-Funded Warrants."

Dividends paid to a U.S. Holder of our common stock that is a taxable corporation will generally qualify for the dividends received deduction if the requirements relating to the requisite holding period are satisfied. With certain exceptions, and provided certain holding period requirements are met, dividends we pay to a non-corporate U.S. Holder will generally constitute "qualified dividends" that currently are subject to tax at preferential long-term capital gains rates.

Constructive Distributions on Pre-Funded Warrants

Under Section 305 of the Code, an adjustment to (or failure to adjust) the number of shares that will be issued on the exercise of the pre-funded warrants may be treated as a constructive distribution to a U.S. Holder of pre-funded warrants if, and to the extent that, such adjustment (or failure to adjust) has the effect of increasing such U.S. Holder's proportionate interest in our assets or earnings and profits as determined under U.S. federal income tax law, depending on the circumstances of such adjustment and subject to certain additional requirements. U.S. Holders should consult their tax advisors on the circumstances in which a constructive distribution may be realized, and the tax consequences of any such constructive distribution.

Sale or Other Taxable Disposition of Common Stock or Pre-Funded Warrants

Upon a sale, taxable exchange or other taxable disposition of our common stock or pre-funded warrants, a U.S. Holder will generally recognize taxable gain or loss in an amount equal to the difference between (1) the amount realized upon such sale, exchange or disposition and (2) the U.S. Holder's tax basis in the common stock or pre-funded warrant. Such gain or loss will generally be treated as long-term capital gain or loss if the common stock or pre-funded warrant is held by the U.S. Holder for more than one year at the time of such sale, exchange or disposition.

Information Reporting and Backup Withholding

Information reporting requirements may apply to dividends paid to a U.S. Holder and to the proceeds of the sale, exchange or other taxable disposition of our common stock, unless the U.S. Holder is an exempt recipient (provided that, in the case of dividends paid to such exempt recipient, the exempt recipient is not subject to backup withholding under Section 3406 of the Code). Backup withholding may apply to such payments if the U.S. Holder fails to provide a taxpayer identification number or a certification of exempt status or has been notified by the IRS that it is subject to backup withholding (and such notification has not been withdrawn).

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a U.S. Holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Non-U.S. Holders

Distributions (and Constructive Distributions) on Common Stock

We have no present intention to pay cash dividends on our common stock. However, if we do make distributions of cash or other property on our common stock (other than certain distributions of our common stock), those distributions will generally constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. If the amount of such distributions exceeds our current and accumulated earnings and profits, such excess will generally constitute a non-taxable return of capital and will first be applied against and reduce, but not below zero, a Non-U.S. Holder's adjusted tax basis in our common stock. Any excess will be treated as capital gain and will be treated as

described below under the subsection titled “Sale or Other Taxable Disposition of Common Stock or Pre-Funded Warrants.”

Dividends paid to a Non-U.S. Holder of our common stock that is not effectively connected with such Non-U.S. Holder’s conduct of a trade or business in the United States will generally be subject to U.S. federal withholding tax at a rate of 30% of the gross amount of the dividends (or such lower rate specified by an applicable income tax treaty, provided such Non-U.S. Holder furnishes the applicable withholding agent with documentation required to claim benefits under such tax treaty (generally, a valid IRS Form W-8BEN or W-8BEN-E or a successor form)). These certifications must be provided to the applicable withholding agent prior to the payment of dividends and must be updated periodically. Each Non-U.S. Holder is urged to consult its tax advisor regarding U.S. federal withholding tax on distributions on our common stock, including such Non-U.S. Holder’s eligibility for benefits under any applicable income tax treaties and the availability of a refund on any excess U.S. federal tax withheld.

If dividends paid to a Non-U.S. Holder are effectively connected with such Non-U.S. Holder’s conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, such Non-U.S. Holder maintains a permanent establishment in the United States to which such dividends are attributable), such Non-U.S. Holder will generally be exempt from the U.S. federal withholding tax described above. To claim the exemption, a Non-U.S. Holder must furnish to the applicable withholding agent a valid IRS Form W-8ECI (or a successor form) certifying that the dividends are effectively connected with such Non-U.S. Holder’s conduct of a trade or business within the United States. In general, any such effectively connected dividends will be subject to U.S. federal income tax on a net income basis at the regular rates applicable to a U.S. person, unless a specific treaty exemption applies. A Non-U.S. Holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected dividends, as adjusted for certain items. Each Non-U.S. Holder is urged to consult its tax advisor regarding the U.S. federal income tax considerations of any distributions with respect to our common stock, including any applicable tax treaties that may provide for different rules.

Sale or Other Taxable Disposition of Common Stock or Pre-Funded Warrants

A Non-U.S. Holder will generally not be subject to U.S. federal income or withholding tax on any gain realized upon the sale or other taxable disposition of our common stock or pre-funded warrants unless:

- the gain is effectively connected with such Non-U.S. Holder’s conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the Non-U.S. Holder maintains a permanent establishment or fixed base in the United States to which such gain is attributable);
- such Non-U.S. Holder is a nonresident alien individual present in the United States for 183 days or more during the taxable year of the disposition and certain other requirements are met; or
- our common stock or pre-funded warrants constitute a U.S. real property interest (“USRPI”) by reason of our status as a U.S. real property holding corporation (“USRPHC”) for U.S. federal income tax purposes.

Gain described in the first bullet point above will generally be subject to U.S. federal income tax on a net income basis at the regular rates applicable to U.S. persons, unless a specific treaty exemption applies. A Non-U.S. Holder that is a corporation also may be subject to a “branch profits tax” at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected gain, as adjusted for certain items.

Gain described in the second bullet point above will generally be subject to U.S. federal income tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty), which may be offset by certain U.S.-source capital losses of a Non-U.S. Holder, provided such Non-U.S. Holder has timely filed U.S. federal income tax returns with respect to such losses.

With respect to the third bullet point above, we believe we currently are not, and we do not anticipate becoming, a USRPHC. However, we cannot assure you that we will not become a USRPHC. Even if we are or were to become a USRPHC, however, our common stock will not be treated as a USRPI if our common stock is “regularly traded” on an “established securities market” (as such terms are defined by applicable Treasury Regulations) and such Non-

U.S. Holder owned, actually and constructively, 5% or less of our common stock throughout the shorter of the 5-year period ending on the date of the sale or other taxable disposition or such Non-U.S. Holder's holding period. No assurance can be provided that our common stock will be regularly traded on an established securities market for purposes of the rules described above.

Each Non-U.S. Holder is urged to consult its tax advisor regarding the U.S. federal income tax considerations of the sale or other taxable disposition of our common stock or pre-funded warrants, including any applicable income tax treaties that may provide for different rules.

As discussed above under "U.S. Holders—Constructive Distributions on Pre-Funded Warrants," certain adjustments to the pre-funded warrants may result in a constructive distribution to holders of such pre-funded warrants. Non-U.S. Holders should consult their tax advisors on the circumstances in which a constructive distribution may be realized, and the tax consequences of any such constructive distribution.

Information Reporting and Backup Withholding

Payments of dividends on our common stock generally will not be subject to backup withholding provided the applicable withholding agent does not have actual knowledge or reason to know the Non-U.S. Holder is a U.S. person and the Non-U.S. Holder certifies its non-U.S. status by furnishing a valid IRS Form W-8BEN, W-8BEN-E, W-8ECI, W-8EXP or other applicable IRS form, or otherwise establishes an exemption. Information returns are required to be filed with the IRS in connection with any distributions on our common stock paid to the Non-U.S. Holder, regardless of whether any tax was actually withheld. Copies of these information returns may also be made available under the provisions of an applicable treaty or agreement to the tax authorities of the country in which the Non-U.S. Holder resides or is established.

Information reporting and, depending on the circumstances, backup withholding generally will apply (at a current rate of 24%) to the proceeds of the sale or other taxable disposition of our common stock within the United States or conducted through certain U.S.-related brokers, unless the applicable withholding agent receives the certification described above and does not have actual knowledge or reason to know that the Non-U.S. Holder is a U.S. person, or the holder otherwise establishes an exemption. Proceeds of a disposition of our common stock conducted through a non-U.S. office of a non-U.S. broker that does not have certain enumerated relationships with the United States generally will not be subject to backup withholding or information reporting.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a Non-U.S. Holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Additional Withholding Tax on Payments Made to Foreign Accounts

Withholding taxes may be imposed under Sections 1471 to 1474 of the Code and the rules and regulations promulgated thereunder (commonly referred to as "FATCA") on certain types of payments made to non-U.S. financial institutions and certain other non-U.S. entities. Specifically, a 30% withholding tax may be imposed on dividends on our common stock paid to a "foreign financial institution" or a "non-financial foreign entity" (each as defined in the Code), unless: (i) the foreign financial institution undertakes certain diligence, reporting and withholding obligations; (ii) the non-financial foreign entity either certifies it does not have any "substantial U.S. owners" (as defined in the Code) or furnishes identifying information regarding each substantial U.S. owner; or (iii) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules. If the payee is a foreign financial institution and is subject to the diligence, reporting and withholding requirements in (i) above, it must enter into an agreement with the U.S. Department of the Treasury requiring, among other things, that it undertake to identify accounts held by certain "specified U.S. persons" or "United States-owned foreign entities" (each as defined in the Code), annually report certain information about such accounts, and withhold 30% on certain payments to noncompliant foreign financial institutions and certain other account holders. Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States concerning FATCA may be subject to different rules. If a dividend payment is both subject to withholding under FATCA and subject to the withholding tax discussed above under the section titled "Non-U.S. Holders—

Distributions (and Constructive Distributions) on Common Stock,” the withholding under FATCA may be credited against, and therefore reduce, such other withholding tax.

Prospective investors should consult their tax advisors regarding the potential application of withholding under FATCA to their investment in our common stock.

UNDERWRITING

Leerink Partners LLC, Stifel, Nicolaus & Company, Incorporated and Guggenheim Securities, LLC are acting as representatives of each of the underwriters named below and as joint bookrunning managers for this offering. Subject to the terms and conditions set forth in the underwriting agreement among us and the underwriters, we have agreed to sell to the underwriters, and each of the underwriters has agreed, severally and not jointly, to purchase from us, the number of shares of common stock and pre-funded warrants set forth opposite its name below.

Underwriter	Number of Shares to be Purchased	Number of Pre-Funded Warrants to be Purchased
Leerink Partners LLC		
Stifel, Nicolaus & Company, Incorporated		
Guggenheim Securities, LLC		
LifeSci Capital LLC		
William Blair & Company, L.L.C.		
Total		

Subject to the terms and conditions set forth in the underwriting agreement, the underwriters have agreed, severally and not jointly, to purchase all of the shares of common stock and pre-funded warrants sold under the underwriting agreement if any of the shares of common stock or pre-funded warrants are purchased. If an underwriter defaults, the underwriting agreement provides that the purchase commitments of the non-defaulting underwriters may be increased or the underwriting agreement may be terminated.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act, or to contribute to payments the underwriters may be required to make in respect of those liabilities.

The underwriters are offering the shares of common stock and pre-funded warrants, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by their counsel, including the validity of the shares of common stock and pre-funded warrants, and subject to other conditions contained in the underwriting agreement, such as the receipt by the underwriters of officers' certificates and legal opinions. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

The underwriters have not been engaged to act as warrant agent for the pre-funded warrants or to act as underwriter or agent or otherwise participate in the issuance of the shares of our common stock upon the exercise of the pre-funded warrants.

Discounts and Commissions

The representatives have advised us that the underwriters propose to initially offer the shares of common stock and pre-funded warrants to the public at the initial public offering price set forth on the cover page of this prospectus supplement and to dealers at that price less a concession not in excess of \$ per share of common stock and at that price less a concession not in excess of \$ per pre-funded warrant. After the offering of the shares of common stock and pre-funded warrants, the public offering price, concession or any other term of this offering may be changed by the representatives.

The following table shows the initial public offering price, underwriting discounts and commissions and proceeds, before expenses, to us. The information assumes either no exercise or full exercise by the underwriters of their option to purchase additional shares of our common stock.

	Per Share	Per Pre-Funded Warrant	Total	
			Without Option	With Option
Initial public offering price	\$	\$	\$	\$
Underwriting discounts and commissions	\$	\$	\$	\$
Proceeds, before expenses, to us	\$	\$	\$	\$

We estimate expenses payable by us in connection with this offering, other than the underwriting discounts and commissions referred to above, will be approximately \$. We also have agreed to reimburse the underwriters for up to \$20,000 for their FINRA counsel fee. In accordance with FINRA Rule 5110, this reimbursed fee is deemed underwriting compensation for this offering.

Option to Purchase Additional Shares

We have granted an option to the underwriters, exercisable for 30 days after the date of this prospectus supplement, to purchase up to additional shares at the initial public offering price, less underwriting discounts and commissions. If the underwriters exercise this option, each underwriter will be obligated, subject to the conditions contained in the underwriting agreement, to purchase a number of additional shares proportionate to that underwriter's amount reflected in the above table.

No Sales of Similar Securities

We have agreed that, during the period commencing on and including the date of this prospectus supplement and continuing through and including the 60th day following the date of this prospectus supplement (the "Lock-Up Period"), we will not, without the prior written consent of Leerink Partners LLC, Stifel, Nicolaus & Company, Incorporated and Guggenheim Securities, LLC, on behalf of the underwriters, (i) directly or indirectly, offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase or otherwise transfer or dispose of any shares of common stock or any securities convertible into or exercisable or exchangeable for common stock or file or confidentially submit any registration statement under the Securities Act with respect to any of the foregoing, (ii) enter into any swap or any other agreement or any transaction that transfers, in whole or in part, directly or indirectly, the economic consequence of ownership of the common stock, whether any such swap or transaction described in clause (i) or (ii) above is to be settled by delivery of common stock or such other securities, in cash or otherwise or (iii) publicly announce an intention to effect any such swap, agreement or other transaction described in clauses (i) and (ii). The foregoing sentence shall not apply to (A) the securities to be sold under this prospectus supplement; (B) any shares of common stock issued by us upon the exercise of an option or warrant or the conversion of a convertible security outstanding on the date hereof and referred to in this prospectus supplement, the accompanying prospectus or the documents incorporated herein or therein; (C) any shares of common stock issued or options to purchase common stock granted pursuant to existing employee benefit plans referred to in this prospectus supplement, the accompanying prospectus or the documents incorporated herein or therein; (D) any shares of common stock issued pursuant to any existing non-employee director stock plan or dividend reinvestment plan referred to in this prospectus supplement, the accompanying prospectus or the documents incorporated herein or therein; (E) the filing by us of any registration statement on Form S-8 or a successor form thereto; or (F) the sale or issuance of or entry into an agreement to sell or issue shares of common stock or other securities issued in connection with any (1) merger, (2) acquisition of securities, businesses, properties or other assets, (3) joint venture or (4) strategic alliance or relationship; *provided*, that the aggregate number of shares issued pursuant to this clause (F) shall not exceed 5.0% of the total number of outstanding shares of common stock immediately following the issuance and sale of the securities. Notwithstanding the foregoing, we may effect sales pursuant to the Sales Agreement, provided, that (X) we notify the representatives prior to effecting any sales and (Y) no sales shall be made until the earlier of (i) the exercise in full by the

underwriters of their option to purchase additional shares of our common stock and (ii) 30 calendar days after the date of this prospectus supplement.

Our executive officers and directors (the “lock-up signatories”) have agreed, subject to certain exceptions, not to sell or transfer any shares of common stock or securities convertible into or exchangeable into or exercisable for shares of common stock, during the Lock-Up Period without first obtaining the written consent of Leerink Partners LLC, Stifel, Nicolaus & Company, Incorporated and Guggenheim Securities, LLC, on behalf of the underwriters. Specifically, the lock-up signatories have agreed, with certain limited exceptions, not to directly or indirectly, (i) offer, sell, assign, transfer, pledge, contract to sell, lend or otherwise dispose of, or announce the intention to otherwise dispose of, any shares of common stock (including, without limitation, common stock which may be deemed to be beneficially owned by the lock-up signatory in accordance with the rules and regulations promulgated under the Securities Act as the same may be amended or supplemented from time to time (such shares, the “Beneficially Owned Shares”) or securities convertible into or exercisable or exchangeable for common stock, (ii) enter into, or announce the intention to enter into, any swap, hedge or similar agreement or arrangement (including, without limitation, the purchase or sale of, or entry into, any put or call option, or combination thereof, forward, swap or any other derivative transaction or instrument, however described or defined) that transfers, is designed to transfer or reasonably could be expected to transfer (whether by the lock-up signatory or someone other than the lock-up signatory) in whole or in part, directly or indirectly, the economic risk of ownership of the Beneficially Owned Shares or securities convertible into or exercisable or exchangeable for common stock, whether now owned or hereafter acquired by the lock-up signatory or with respect to which the lock-up signatory has or hereafter acquires the power of disposition (the “Prohibited Activity”), or (iii) engage in, or announce the intention to engage in, any short selling of the common stock or securities convertible into or exercisable or exchangeable for common stock. The lock-up signatory represents and warrants that the lock-up signatory is not, and has not caused or directed any of its affiliates to be or become, currently a party to any agreement or arrangement that is designed to or which reasonably could be expected to lead to or result in any Prohibited Activity during the Lock-Up Period. If the lock-up signatory is not a natural person, the lock-up signatory represents and warrants that no single natural person, entity or “group” (within the meaning of Section 13(d)(3) of the Exchange Act), other than a natural person, entity or “group” (as described above) that has executed a lock-up agreement, beneficially owns, directly or indirectly, 50% or more of the common equity interests, or 50% or more of the voting power, in the lock-up signatory.

The restrictions set forth in the immediately preceding paragraph shall not apply to:

- (1) if the lock-up signatory is a natural person, any transfers made by the lock-up signatory (a) as a bona fide gift to any member of the immediate family (as defined below) of the lock-up signatory or to a trust the beneficiaries of which are exclusively the lock-up signatory or members of the lock-up signatory’s immediate family, (b) by will or intestate succession upon the death of the lock-up signatory or (c) as a bona fide gift to a charity or educational institution,
- (2) if the lock-up signatory is a corporation, partnership, limited liability company or other business entity, any transfers to any stockholder, partner or member of, or owner of a similar equity interest in, the lock-up signatory, as the case may be, if, in any such case, such transfer is not for value,
- (3) if the lock-up signatory is a corporation, partnership, limited liability company or other business entity, any transfer made by the lock-up signatory (a) in connection with the sale or other bona fide transfer in a single transaction of all or substantially all of the lock-up signatory’s capital stock, partnership interests, membership interests or other similar equity interests, as the case may be, or all or substantially all of the lock-up signatory’s assets, in any such case not undertaken for the purpose of avoiding the restrictions imposed by the lock-up agreement or (b) to another corporation, partnership, limited liability company or other business entity so long as the transferee is an affiliate (as defined below) of the lock-up signatory and such transfer is not for value,
- (4) transactions relating to common stock or other securities convertible into or exercisable or exchangeable for common stock acquired in open market transactions after completion of this offering; provided, that no

such transaction is required to be, or is, voluntarily publicly announced (whether on Form 4, Form 5 or otherwise) during the Lock-Up Period,

- (5) the entry, by the lock-up signatory, at any time on or after the date of this prospectus supplement, of any trading plan providing for the sale of common stock by the lock-up signatory, which trading plan meets the requirements of Rule 10b5-1(c) under the Exchange Act; provided, however, that such plan does not provide for, or permit, the sale of any common stock during the Lock-Up Period and to the extent a public announcement or filing under the Exchange Act, if any, is required to be made regarding the establishment of such new 10b5-1 plan, such announcement or filing shall include a statement to the effect that no sale of securities may be made under such new 10b5-1 plan during the Lock-Up Period,
- (6) the sale of securities (including following the exercise of options to purchase securities) pursuant to a 10b5-1 plan adopted prior to the date of the lock-up agreement, provided, however, that the existence and details of such 10b5-1 plan were communicated to the representatives prior to the date of the lock-up agreement and such 10b5-1 plan will not be amended or otherwise modified during the Lock-Up Period,
- (7) any transfers made by the lock-up signatory to us to satisfy tax withholding obligations pursuant to our equity incentive plans or arrangements disclosed in this prospectus; and

provided, however, that in the case of any transfer described in clause (1), (2) or (3) above, it shall be a condition to the transfer that (A) the transferee executes and delivers to the representatives, acting on behalf of the underwriters, not later than one business day prior to such transfer, a lock-up agreement (it being understood that any references to “immediate family” in the agreement executed by such transferee shall expressly refer only to the immediate family of the lock-up signatory and not to the immediate family of the transferee) and otherwise satisfactory in form and substance to the representatives, and (B) in the case of any transfer described in clause (1), (2), (3), (6) or (7) above, no public announcement or filing is voluntarily made regarding such transfer during the Lock-Up Period and if the lock-up signatory is required to file a report under Section 16(a) of the Exchange Act, reporting a reduction in beneficial ownership of shares of common stock or Beneficially Owned Shares or any securities convertible into or exercisable or exchangeable for common stock or Beneficially Owned Shares during the Lock-Up Period, the lock-up signatory shall include a statement in such report to the effect that, (A) in the case of any transfer pursuant to clause (1) above, such transfer is being made as a gift or by will or intestate succession, (B) in the case of any transfer pursuant to clause (2) above, such transfer is being made to a stockholder, partner or member of, or owner of a similar equity interest in, the lock-up signatory and is not a transfer for value, (C) in the case of any transfer pursuant to clause (3) above, such transfer is being made either (a) in connection with the sale or other bona fide transfer in a single transaction of all or substantially all of the lock-up signatory’s capital stock, partnership interests, membership interests or other similar equity interests, as the case may be, or all or substantially all of the lock-up signatory’s assets or (b) to another corporation, partnership, limited liability company or other business entity that is an affiliate of the lock-up signatory and such transfer is not for value, (D) in the case of any transfer pursuant to clause (6) above, such sale is being made pursuant to a 10b5-1 plan and (E) in the case of any transfer pursuant to clause (7) above, such transfer is being made to satisfy tax withholding obligations. For purposes of this paragraph, “immediate family” shall mean a spouse, child, grandchild or other lineal descendant (including by adoption), father, mother, brother or sister of the lock-up signatory; and “affiliate” shall have the meaning set forth in Rule 405 under the Securities Act.

Nasdaq Global Market Listing

Our common stock is listed on the Nasdaq Global Market under the symbol “NGNE.” We do not intend to list the pre-funded warrants on the Nasdaq Global Market, any other nationally recognized securities exchange or any other nationally recognized trading system.

Price Stabilization, Short Positions and Penalty Bids

Until the distribution of the shares of common stock and pre-funded warrants is completed, SEC rules may limit underwriters and selling group members from bidding for and purchasing our common stock. However, the representatives may engage in transactions that stabilize the price of the common stock, such as bids or purchases to peg, fix or maintain that price.

In connection with this offering, the underwriters may purchase and sell our common stock in the open market. These transactions may include short sales, purchases on the open market to cover positions created by short sales and stabilizing transactions. Short sales involve the sale by the underwriters of a greater number of shares of common stock and pre-funded warrants than they are required to purchase in this offering. “Covered” short sales are sales made in an amount not greater than the underwriters’ option to purchase additional shares described above. The underwriters may close out any covered short position by either exercising their option to purchase additional shares or purchasing shares in the open market. In determining the source of shares to close out the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared to the price at which they may purchase shares through the option to purchase additional shares granted to them under the underwriting agreement described above. “Naked” short sales are sales in excess of such option. The underwriters must close out any naked short position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of our common stock in the open market after pricing that could adversely affect investors who purchase in this offering. Stabilizing transactions consist of various bids for or purchases of shares of common stock made by the underwriters in the open market prior to the closing of this offering.

The underwriters may also impose a penalty bid. This occurs when a particular underwriter repays to the underwriters a portion of the underwriting discount received by it because the representatives have repurchased shares sold by or for the account of such underwriter in stabilizing or short covering transactions.

Similar to other purchase transactions, the underwriters’ purchases to cover the syndicate short sales may have the effect of raising or maintaining the market price of our common stock or preventing or retarding a decline in the market price of our common stock. As a result, the price of our common stock may be higher than the price that might otherwise exist in the open market. The underwriters may conduct these transactions on the Nasdaq Global Market, in the over-the-counter market or otherwise.

Neither we nor any of the underwriters make any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of our common stock. In addition, neither we nor any of the underwriters make any representation that the representatives will engage in these transactions or that these transactions, once commenced, will not be discontinued without notice.

Electronic Distribution

In connection with this offering, certain of the underwriters or securities dealers may distribute prospectuses by electronic means, such as e-mail.

Other Relationships

The underwriters and certain of their affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, investment research, principal investment, hedging, financing and brokerage activities. Some of the underwriters and certain of their affiliates may in the future engage in investment banking and other commercial dealings in the ordinary course of business with us and our affiliates, for which they may in the future receive customary fees, commissions and expenses.

In addition, in the ordinary course of their business activities, the underwriters and their affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers. Such investments and securities activities may involve securities and/or instruments of ours or our affiliates. The underwriters and their affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or financial instruments and may hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

Leerink Partners LLC is the sales agent under the Sales Agreement, pursuant to which we may offer and sell, from time to time, shares of our common stock by any method that is deemed to be an “at the market offering” under Rule 415(a)(4) under the Securities Act.

Selling Restrictions

Notice to Prospective Investors in the European Economic Area

In relation to each Member State of the European Economic Area (each, a “Relevant State”), no securities have been offered or will be offered pursuant to the offering to the public in that Relevant State prior to the publication of a prospectus in relation to the securities which has been approved by the competent authority in that Relevant State or, where appropriate, approved in another Relevant State and notified to the competent authority in that Relevant State, all in accordance with the Prospectus Regulation, except that securities may be offered to the public in that Relevant State at any time:

- A. to any legal entity which is a qualified investor as defined under Article 2 of the Prospectus Regulation;
- B. to fewer than 150 natural or legal persons (other than qualified investors as defined under Article 2 of the Prospectus Regulation), subject to obtaining the prior consent of the representatives for any such offer; or
- C. in any other circumstances falling within Article 1(4) of the Prospectus Regulation,

provided that no such offer of securities shall require us or any of the representatives to publish a prospectus pursuant to Article 3 of the Prospectus Regulation or supplement a prospectus pursuant to Article 23 of the Prospectus Regulation. For the purposes of this provision, the expression an “offer to the public” in relation to any securities in any Relevant State means the communication in any form and by any means of sufficient information on the terms of the offer and any securities to be offered so as to enable an investor to decide to purchase or subscribe for any securities, and the expression “Prospectus Regulation” means Regulation (EU) 2017/1129, as amended.

Notice to Prospective Investors in the United Kingdom

No securities have been offered or will be offered pursuant to the offering to the public in the United Kingdom prior to the publication of a prospectus in relation to the securities which has been approved by the Financial Conduct Authority, except that the securities may be offered to the public in the United Kingdom at any time:

- A. to any legal entity which is a qualified investor as defined under Article 2 of the UK Prospectus Regulation;
- B. to fewer than 150 natural or legal persons (other than qualified investors as defined under Article 2 of the UK Prospectus Regulation), subject to obtaining the prior consent of the representatives for any such offer; or
- C. in any other circumstances falling within Section 86 of the Financial Services and Markets Act 2000 (the “FSMA”),

provided that no such offer of the securities shall require us or any representative to publish a prospectus pursuant to Section 85 of the FSMA or supplement a prospectus pursuant to Article 23 of the UK Prospectus Regulation. For the purposes of this provision, the expression an “offer to the public” in relation to the securities in the United Kingdom means the communication in any form and by any means of sufficient information on the terms of the offer and any securities to be offered so as to enable an investor to decide to purchase or subscribe for any securities and the expression “UK Prospectus Regulation” means Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018.

Notice to Prospective Investors in Canada

The securities may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations. Any resale of the securities must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus supplement (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 Underwriting Conflicts (NI 33-105), the underwriters are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

LEGAL MATTERS

Certain legal matters, including the legality of the securities offered, will be passed upon for us by Gibson, Dunn & Crutcher LLP, San Francisco, California. The underwriters are being represented in connection with this offering by Cooley LLP, New York, New York.

EXPERTS

The financial statements of Neurogene Inc. as of December 31, 2025 and 2024, and for each of the two years in the period ended December 31, 2025, incorporated by reference in this prospectus supplement, have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report. Such financial statements are incorporated by reference in reliance upon the report of such firm given their authority as experts in accounting and auditing.

INCORPORATION BY REFERENCE

This prospectus supplement incorporates by reference important business and financial information about the Company that is not included in or delivered with this document. The information incorporated by reference is considered to be part of this prospectus supplement, and the SEC allows us to “incorporate by reference” the information we file with it, which means that we can disclose important information to you by referring you to those documents instead of having to repeat the information in this prospectus supplement. Any information referenced in this way is considered part of this prospectus supplement. Any subsequent information filed with the SEC will automatically be deemed to update and supersede the information in this prospectus supplement and in our other filings with the SEC. We are incorporating by reference the documents listed below:

- our Annual Report on [Form 10-K](#) for the fiscal year ended December 31, 2025, filed with the SEC on March 24, 2026;
- the information specifically incorporated by reference into our Annual Report on [Form 10-K](#) for the year ended December 31, 2025 from our Definitive Proxy Statement on [Schedule 14A](#) filed on April 16, 2026;
- our Quarterly Report on [Form 10-Q](#) for the quarter ended March 31, 2026 filed with the SEC on May 12, 2026;
- our Current Reports on Form 8-K filed with the SEC on [April 20, 2026](#), [June 4, 2026](#) and [June 29, 2026](#) (Item 8.01 only); and
- the description of our securities contained in our Registration Statement on [Form 8-A](#) filed with the SEC on March 3, 2014, including any amendment or reports filed for the purpose of updating such description.

Notwithstanding the foregoing, information furnished under Items 2.02 and 7.01 of any Current Report on Form 8-K, including the related exhibits under Item 9.01, is not incorporated by reference in this prospectus supplement.

We also incorporate by reference into this prospectus supplement any further filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act (other than portions deemed to have been “furnished” and not filed with the SEC, including those made pursuant to Item 2.02 or Item 7.01 of Form 8-K or other information), including all filings filed after the date hereof and prior to the completion of the offering of all securities under this prospectus supplement.

We will furnish without charge to you, on written or oral request, a copy of any or all of the documents incorporated by reference in this prospectus supplement, including exhibits to these documents. You should direct any requests for documents to Neurogene Inc., 535 W 24th St., 5th Floor, New York, NY 10011, telephone: (855) 508-3568. You also may access these filings on our website at www.neurogene.com. We do not incorporate the information on our website into this prospectus supplement and you should not consider any information on, or that can be accessed through, our website as part of this prospectus supplement (other than those filings with the SEC that we specifically incorporate by reference into this prospectus supplement).

WHERE YOU CAN FIND MORE INFORMATION

We are subject to the informational requirements of the Exchange Act and are required to file annual, quarterly and other reports, proxy statements and other information with the SEC. The SEC maintains an Internet website (<http://www.sec.gov>) that contains reports, proxy and information statements, and various other information about registrants, like us, that file electronically with the SEC.

Information about us is also available at our website at <http://www.neurogene.com>. You may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. However, the information on our website is not a part of this prospectus supplement and is not incorporated by reference into this prospectus supplement.

We have filed with the SEC a registration statement on Form S-3 under the Securities Act relating to the securities covered by this prospectus supplement. This prospectus supplement is a part of the registration statement and does not contain all of the information in the registration statement. Whenever a reference is made in this prospectus supplement to a contract or other document of ours, please be aware that the reference is only a summary and that you should refer to the exhibits that are part of the registration statement for a copy of the contract or other document. You may review a copy of the registration statement through the SEC's website or our website.



**Neurogene Inc.
Common Stock
Preferred Stock
Debt Securities
Warrants
Units**

From time to time, we may issue, in one or more series or classes, up to a maximum aggregate offering price of \$300,000,000 of our common stock, preferred stock, debt securities, warrants and/or units, at prices and on terms that we will determine at the time of the offering.

This prospectus provides you with a general description of the securities we may offer. Each time we offer securities, we will provide specific terms of the securities offered in a supplement to this prospectus. We may also authorize one or more free writing prospectuses to be provided to you in connection with these offerings. The prospectus supplement and any related free writing prospectus may also add, update or change information contained in this prospectus. We may not sell any securities under this prospectus without delivery of the applicable prospectus supplement. If information in any prospectus supplement is inconsistent with the information in this prospectus, then the information in that prospectus supplement will apply and will supersede the information in this prospectus.

You should read this prospectus, the applicable prospectus supplement and any related free writing prospectus carefully, as well as any documents incorporated by reference, before you invest in any of the securities being offered.

Our Common Stock, par value \$0.000001 per share, is traded on The Nasdaq Global Market ("Nasdaq") under the symbol "NGNE." On March 21, 2025, the last reported sale price for our Common Stock was \$14.21 per share.

An investment in our securities involves a high degree of risk. You should carefully consider the information under the heading "[Risk Factors](#)" beginning on page 2 of this prospectus and any applicable prospectus supplement. We are a "smaller reporting company" as defined by Rule 12b-2 of the Exchange Act and are subject to reduced public company reporting requirements. Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus is April 4 , 2025.

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ABOUT THIS PROSPECTUS

This prospectus is a part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission (the “SEC” or the “Commission”) using a “shelf” registration process. Under this shelf registration process, we may sell any combination of the securities described in this prospectus from time to time in one or more offerings up to a total dollar amount of \$300,000,000. This prospectus provides you with a general description of the securities we may offer.

Each time we sell securities under this prospectus, we will provide a prospectus supplement that will contain specific information about the terms of that offering. We may also authorize one or more free writing prospectuses to be provided to you that may contain material information relating to these offerings. The prospectus supplement and any related free writing prospectus that we may authorize to be provided to you may also add, update or change information contained in this prospectus or in any documents that we have incorporated by reference into this prospectus. You should carefully read both this prospectus and any prospectus supplement together with additional information under the headings “Where You Can Find More Information” and “Incorporation by Reference.”

We have not authorized anyone to provide you with any information other than that contained or incorporated by reference in this prospectus and any applicable prospectus supplement, along with the information contained in any free writing prospectuses we have authorized for use in connection with a specific offering. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus is an offer to sell only the securities offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. This prospectus, any applicable supplement to this prospectus or any related free writing prospectus do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate, nor do this prospectus, any applicable supplement to this prospectus or any related free writing prospectus constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction.

You should not assume that the information contained in this prospectus, any applicable prospectus supplement or any related free writing prospectus is accurate on any date subsequent to the date set forth on the front of the document or that any information we have incorporated by reference is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus, any applicable prospectus supplement or any related free writing prospectus is delivered, or securities are sold, on a later date.

In this prospectus, unless the context otherwise requires, the terms “Neurogene,” the “Registrant,” the “Company,” “we,” “us,” and “our” refer to Neurogene Inc. (formerly Neoleukin Therapeutics, Inc.), a Delaware corporation, and Neurogene Inc., a Nevada corporation, the wholly owned operating subsidiary of the Delaware corporation. The name “Neurogene” is a trademark of the Company in the United States. This report also contains references to registered marks, trademarks and trade names of other companies that are property of their respective holders. All other trademarks, registered marks and trade names appearing in this report are the property of their respective holders.

CAUTIONARY STATEMENT CONCERNING FORWARD-LOOKING STATEMENTS

We make “forward-looking statements” within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”) in this prospectus and any accompanying prospectus supplement, including the documents that we incorporate by reference herein and therein. These forward-looking statements can generally be identified as such because the context of the statement will include words such as “may,” “will,” “intend,” “plan,” “believe,” “anticipate,” “expect,” “estimate,” “predict,” “potential,” “continue,” “likely,” “target,” “forecast,” or “opportunity,” the negative of these words or other similar words. Similarly, statements that describe our plans, strategies, intentions, expectations, objectives, goals or prospects and other statements that are not historical facts are also forward-looking statements. For such statements, we claim the protection of the Private Securities Litigation Reform Act of 1995. Readers of this prospectus are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the time this prospectus was filed with the SEC. These forward-looking statements are based largely on our expectations and projections about future events and future trends affecting our business and are subject to risks and uncertainties that could cause actual results to differ materially from those anticipated in the forward-looking statements. These risks and uncertainties include, without limitation, the risk factors discussed in the section titled “Risk Factors” and elsewhere and incorporated by reference in this prospectus. Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future.

Any forward-looking statements in this prospectus reflect our current views with respect to future events or to our future financial performance and involve known and unknown risks, uncertainties, and other factors that may cause our actual results, performance, or achievements to be materially different from any future results, performance, or achievements expressed or implied by these forward-looking statements.

This prospectus also contains or incorporates by reference estimates, projections, and other information concerning our industry, our business, and the markets for certain diseases, including data regarding the estimated size of those markets, and the incidence and prevalence of certain medical conditions. Information that is based on estimates, forecasts, projections, market research, or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances reflected in this information. Unless otherwise expressly stated, we obtained this industry, business, market, and other data from reports, research surveys, studies, and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data, and similar sources.

THE COMPANY

We are a clinical-stage biotechnology company committed to overcoming the limitations of conventional gene therapy and turning today's complex devastating neurological diseases into treatable conditions. By harnessing our proprietary transgene regulation technology, EXACT™ (Expression Attenuation via Construct Tuning), we are building a robust and differentiated product portfolio of genetic medicines for rare neurological diseases with high unmet need not otherwise addressable by conventional gene therapy. Our EXACT approach leverages key scientific breakthroughs, including gene transfer technology, microRNA-based genetic circuits, and adeno-associated virus delivery, and is designed to deliver therapeutic levels of transgene to key areas of the brain that underlie neurological disease pathology.

Our first clinical-stage program to utilize the EXACT platform is NGN-401, which is in development for the treatment of Rett syndrome, a disease with a patient population that has a significant unmet need, and that ultimately progresses to substantial neurological and physical impairment and premature death. We are conducting a Phase 1/2 open-label, multi-center clinical trial of NGN-401 gene therapy for the treatment of female patients with classic Rett syndrome that is assessing the safety, tolerability, and efficacy of NGN-401 at a dose of 1E15 vg.

In addition to NGN-401, we have also been pursuing a conventional gene therapy program in a Phase 1/2 clinical trial of NGN-101 for the treatment of CLN5 Batten disease. This patient population has a significant unmet need, and experiences extensive neurological and physical impairment leading to blindness, loss of motor function and early mortality. Our Phase 1/2 clinical trial of NGN-101 was the first trial to assess the treatment of both neurodegenerative and ocular disease manifestations of Batten disease. In November 2024, we announced that the Company does not expect to move forward with the NGN-101 CLN5 Batten disease gene therapy program; given the rarity of the disease, continued investment in the program was predicated on alignment on a streamlined registrational pathway with FDA. To support a streamlined pathway, we submitted a regenerative medicine advanced therapy ("RMAT") application to the FDA. Despite our belief that we met the standard of preliminary clinical evidence required to obtain an RMAT designation, the RMAT application was denied. We are currently evaluating options for the program.

Corporation Information

On December 18, 2023, we completed our business combination (the "Reverse Merger") with Neurogene Inc., a Nevada corporation ("Neurogene OpCo"). In connection with the completion of the Reverse Merger, the Company changed its name from "Neoleukin Therapeutics, Inc." to "Neurogene Inc.," and the business conducted by the Company became primarily the business conducted by Neurogene OpCo.

Our principal executive offices are located at 535 W 24th St., 5th Floor, New York, NY 10011 and our telephone number is (855) 508-3568. Our website is www.neurogene.com. Information contained on or accessible through our website is not a part of this prospectus supplement, and the inclusion of our website address in this prospectus supplement is an inactive textual reference only.

Implications of Being a Smaller Reporting Company

We are a "smaller reporting company," meaning that the market value of our Common Stock held by non-affiliates is less than \$700.0 million and our annual revenue is less than \$100.0 million during the most recently completed fiscal year. We will continue to be a smaller reporting company so long as either (i) the market value of our Common Stock held by non-affiliates is less than \$250.0 million or (ii) our annual revenue is less than \$100.0 million during the most recently completed fiscal year and the market value of our Common Stock held by non-affiliates is less than \$700.0 million. As a smaller reporting company, we may choose to present only the two most recent fiscal years of audited financial statements in our Annual Report and smaller reporting companies have reduced disclosure obligations regarding executive compensation.

RISK FACTORS

Investing in our securities involves a high degree of risk. The prospectus supplement applicable to each offering of securities will contain a discussion of the risks applicable to an investment in our securities. Prior to making a decision about investing in our securities, you should carefully consider the risks, uncertainties and other factors described in our most recent Annual Report on Form 10-K, as supplemented and updated by subsequent Quarterly Reports on Form 10-Q and Current Reports on Form 8-K that we have filed or will file with the SEC, and in other documents which are incorporated by reference into this prospectus, as updated by our subsequent filings under the Exchange Act, and the risk factors and other information contained in any applicable prospectus supplement and any applicable free writing prospectus. It is not possible to predict or identify all such risks; our business, financial condition, results of operations and future growth prospects could also be materially and adversely affected by factors, events or uncertainties that are not presently known to us or that we currently do not consider to present significant risks to our operations. Therefore, you should not consider the risks and uncertainties described in the documents incorporated by reference herein to be a complete statement of all the potential risks or uncertainties that we face. For more information, see “*Information Incorporated by Reference*” and “*Where You Can Find More Information*”.

USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds from the sale of the securities offered hereby. Unless otherwise specified in a prospectus supplement accompanying this prospectus, the net proceeds from the sale by us of the securities to which this prospectus relates will be used as working capital, including continuing to advance our pipeline through preclinical studies and clinical trials, and for general corporate purposes. Our expected use of proceeds from the sale of the securities offered hereby represents our current intentions based on our present plans and business conditions, which could change in the future as our plans and business conditions evolve. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the proceeds to be received from the sale of the securities offered hereby or the amounts that we will actually spend on the uses set forth above.

Pending the use of the net proceeds, we may invest the proceeds in a variety of capital preservation investments, including interest-bearing, investment-grade securities, certificates of deposit or government securities. When we offer and sell the securities to which this prospectus relates, the prospectus supplement related to such offering will set forth our intended use of the proceeds, if any, received from the sale of such securities.

SECURITIES WE MAY OFFER

This prospectus contains summary descriptions of the securities we may offer from time to time. These summary descriptions are not meant to be complete descriptions of each security. The particular terms of any security will be described in the applicable prospectus supplement.

DESCRIPTION OF SECURITIES

The following description of our capital stock is intended as a summary only and therefore is not a complete description of our capital stock. This description is based upon, and is qualified by reference to, our amended and restated certificate of incorporation (“charter”), our amended and restated bylaws (“bylaws”) and applicable provisions of Delaware corporate law. You should read our charter and our bylaws, copies of which are filed as exhibits to the registration statement of which this prospectus forms a part.

Authorized Capital Stock

Our authorized capital stock consists of 450,000,000 shares of common stock, par value \$0.000001 per share (“Common Stock”), and 50,000,000 shares of undesignated preferred stock, par value \$0.000001 per share (“Preferred Stock”).

Common Stock

Our charter authorizes the issuance of up to 450,000,000 shares of our Common Stock. All outstanding shares of our Common Stock are validly issued, fully paid and nonassessable.

Voting

The holders of Common Stock are entitled to one vote per share on all matters submitted to a vote of stockholders, except for matters relating solely to the terms of Preferred Stock on which holders of our Common Stock shall not be entitled to vote as provided in our charter. A majority vote of the shares present in person or represented by proxy and entitled to vote on the subject matter is required for the holders of our Common Stock to take action on all matters, except as otherwise required by law, our charter or our bylaws. Our charter does not provide for cumulative voting in the election of directors.

Dividends

Subject to preferences that may be applicable to any then-outstanding Preferred Stock, holders of Common Stock are entitled to receive ratably those dividends, if any, as may be declared from time to time by the board of directors out of legally available funds.

Distributions on Liquidation

In the event of our liquidation, dissolution or winding up, holders of Common Stock will be entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities and the satisfaction of any liquidation preference granted to the holders of any then-outstanding shares Preferred Stock.

Rights and Preferences

Holders of Common Stock have no preemptive, conversion or subscription rights and there are no redemption or sinking fund provisions applicable to our Common Stock. The rights, preferences and privileges of the holders of Common Stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of Preferred Stock that we may designate in the future.

Preferred Stock

Under the terms of our charter, our board of directors has the authority, without further action by our stockholders, to issue up to 50,000,000 shares of Preferred Stock in one or more series, to establish from time to

time the number of shares to be included in each such series, to fix the dividend, voting and other rights, preferences and privileges of the shares of each wholly unissued series and any qualifications, limitations or restrictions thereon, and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding. Our board of directors may authorize the issuance of Preferred Stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of our Common Stock. The issuance of Preferred Stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or preventing a change in our control and may adversely affect the market price of our Common Stock and the voting and other rights of the holders of our Common Stock.

Anti-Takeover Effects of Delaware Law and Provisions of Our Charter and Bylaws

Our charter and bylaws include a number of provisions that may have the effect of delaying, deferring or preventing another party from acquiring control of us and encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our board of directors rather than pursue non-negotiated takeover attempts.

- ***Issuance of undesignated Preferred Stock:*** Under our charter, our board of directors has the authority, without further action by the stockholders, to issue up to 50,000,000 shares of undesignated Preferred Stock with rights and preferences, including voting rights, designated from time to time by our board of directors. The existence of authorized but unissued shares of Preferred Stock enables our board of directors to make it more difficult to attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise.
- ***Classified board:*** Our charter establishes a classified board of directors consisting of three classes of directors, with staggered three-year terms. Only one class of directors is elected at each annual meeting of our stockholders, with the other classes continuing for the remainder of their respective three-year terms. This provision may have the effect of delaying a change of control of our board of directors.
- ***Election and removal of directors and board vacancies:*** Our bylaws provide that directors will be elected by a plurality vote. Our charter and bylaws also provide that our board of directors has the right to increase or decrease the size of the board to fill vacancies on the board. Directors may be removed only for cause by the affirmative vote of the holders of at least 66 2/3% of the votes that all our stockholders would be entitled to cast in an annual election of directors. Only our board of directors is authorized to fill vacant directorships. In addition, the number of directors constituting our board of directors may be set only by resolution adopted by a majority of the whole board of directors. These provisions prevent stockholders from increasing the size of our board of directors and gaining control of our board of directors by filling the resulting vacancies with its own nominees.
- ***Requirements for advance notification of stockholder nominations and proposals:*** Our bylaws establish advance notice procedures with respect to stockholder proposals and the nomination of candidates for election as directors that specify certain requirements as to the timing, form and content of a stockholder's notice. Business that may be conducted at an annual meeting of stockholders will be limited to those matters properly brought before the meeting. These provisions may make it more difficult for our stockholders to bring matters before our annual meeting of stockholders or to nominate directors at annual meetings of stockholders.
- ***No written consent of stockholders:*** Our charter provides that all stockholder actions be taken by a vote of the stockholders at an annual or special meeting, and that stockholders may not take any action by written consent in lieu of a meeting. This limit may lengthen the amount of time required to take stockholder actions and would prevent the amendment of our bylaws or removal of directors by our stockholders without holding a meeting of stockholders.
- ***No stockholder ability to call special meetings:*** Our bylaws provide that only a majority of the members of our board of directors then in office may be able to call special meetings of stockholders and only those

matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders.

- ***Amendments to certificate of incorporation and bylaws:*** As required by the Delaware General Corporation Law (the “DGCL”), any amendment to our charter will be required to be approved by a majority of our board of directors as well as, if required by law or the charter, a majority of the outstanding shares entitled to vote on the amendment and a majority of the outstanding shares of each class entitled to vote thereon as a class, except that the amendment of provisions to board classification, election, removal and vacancies, stockholder action, certificate amendments, bylaw amendments, liability of directors, indemnification of directors and officers, and Delaware exclusive forum must be approved by not less than 66 2/3% of the outstanding shares entitled to vote on the amendment, voting together as a single class. Any amendment to our bylaws must be approved by either a majority of the authorized number of directors constituting the board of directors or not less than 66 2/3% of the outstanding shares entitled to vote on the amendment, voting together as a single class.

These provisions are designed to enhance the likelihood of continued stability in the composition of our board of directors and its policies, to discourage certain types of transactions that may involve an actual or threatened acquisition of our company and to reduce our vulnerability to an unsolicited acquisition proposal. We also designed these provisions to discourage certain tactics that may be used in proxy fights. However, these provisions could have the effect of discouraging others from making tender offers for our shares and, as a consequence, they may also reduce fluctuations in the market price of our shares that could result from actual or rumored takeover attempts.

Section 203 of the Delaware General Corporation Law

We are subject to the provisions of Section 203 of the DGCL. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a three-year period following the time that this stockholder 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 DGCL could also have the effect of delaying or preventing a change of control of us.

Choice of Forum

Our charter requires that the Court of Chancery of the State of Delaware be the exclusive forum for the following types of actions or proceedings under Delaware statutory or common law: (1) any derivative action or proceeding brought on our behalf; (2) any action asserting a claim of 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 or officer or other employee arising pursuant to the DGCL or our charter or bylaws; or (4) any action asserting a claim against us that is governed by the internal affairs doctrine. This provision would not apply to claims brought to enforce a duty or liability created by the Exchange Act, or any other claim for which the federal courts have exclusive jurisdiction. Our bylaws provide further that the federal district courts of the United States will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. The forum selection provisions will not apply to claims brought to enforce a duty or liability created by the Exchange Act. It is possible that a court could find that such provisions are inapplicable for a particular claim or action or that such provisions are unenforceable. In addition, 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. 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 have the effect of discouraging lawsuits against us or our directors or officers.

Registration Rights Agreements

2016 Registration Rights Agreement

In connection with our public offering of Common Stock on September 19, 2016, we entered into a registration rights agreement (the “2016 Registration Rights Agreement”) with certain holders of our securities. Under the 2016 Registration Rights Agreement, we agree that, if at any time and from time to time after December 19, 2016, those investors demand that we register their shares of our Common Stock for resale under the Securities Act, we would be obligated to effect such registration. We have registered an aggregate of approximately 1,292,268 shares (after giving effect to the 1-for-5 reverse stock split in September 2023 and the subsequent 1-for-4 reverse stock split in December 2023) for resale, from time to time, by such stockholders. Our registration obligations under the 2016 Registration Rights Agreement covers all shares now held or hereafter acquired by the stockholders who are a party to such agreement and is in effect until the earlier of (a) the date when all of the 2016 Registrable Securities (as defined in the 2016 Registration Rights Agreement) subject to the demand registration rights under the 2016 Registration Rights Agreement have been sold pursuant to an effective registration statement; (b) the 2016 Registrable Securities have been sold pursuant to Rule 144 under the Securities Act (or other similar rule); (c) the 2016 Registrable Securities may be resold without limitations as to volume or manner of sale pursuant to Rule 144 under the Securities Act; or (d) 10 years after the date of the 2016 Registration Rights Agreement, and includes our obligation to facilitate certain underwritten public offerings of our Common Stock by these stockholders in the future.

The foregoing description of the 2016 Registration Rights Agreement does not purport to be complete and is qualified in its entirety by the full text of the 2016 Registration Rights Agreement, a copy of which is filed as Exhibit 4.2 to this Registration Statement.

2024 Registration Rights Agreement

In connection with the closing of a private placement on November 5, 2024 (the “PIPE”), we entered into a registration rights agreement (the “2024 Registration Rights Agreement”) with certain institutional accredited investors (each, a “Selling Stockholder” and collectively, the “the Selling Stockholders”), pursuant to which, among other things, we agreed to file a registration statement covering the resale of the shares of Common Stock issued in the PIPE and the shares of Common Stock underlying the pre-funded warrants (the “Pre-Funded Warrants”) issued in the PIPE (the “2024 Registrable Securities”) by no later than the 30th calendar day following the closing date of the PIPE. In addition, we have agreed to use our best efforts to cause such registration statement to become effective as soon as practicable, but in any event no later than the earlier of (a) the 105th calendar day following the closing date or, (b) the fifth business day after the date we are notified (orally or in writing, whichever is earlier) by the SEC that the registration statement will not be “reviewed” or will not be subject to further review. We are required to use our best efforts to keep such registration statement continuously effective until the date that all 2024 Registrable Securities covered by such registration statement (i) have been sold, thereunder or pursuant to Rule 144, or (ii) may be sold without volume or manner-of-sale restrictions pursuant to Rule 144 and without the requirement for us to be in compliance with the current public information requirement under Rule 144. We will be responsible for all fees and expenses incurred in connection with the registration of the 2024 Registrable Securities.

The 2024 Registration Rights Agreement requires us to provide certain customary indemnification to the Selling Stockholders in connection with the registration statement.

The foregoing description of the 2024 Registration Rights Agreement does not purport to be complete and is qualified in its entirety by the full text of the 2024 Registration Rights Agreement, a copy of which is filed as Exhibit 4.3 to this registration statement.

Transfer Agent and Registrar

Equiniti Trust Company, LLC serves as the transfer agent and registrar for our Common Stock.

Listing

Our Common Stock is listed on Nasdaq under the symbol “NGNE.”

Debt Securities

The paragraphs below describe the general terms and provisions of the debt securities we may issue. When we offer to sell a particular series of debt securities, we will describe the specific terms of the securities in a supplement to this prospectus, including any additional covenants or changes to existing covenants relating to such series. The prospectus supplement also will indicate whether the general terms and provisions described in this prospectus apply to a particular series of debt securities. You should read the actual indenture if you do not fully understand a term or the way we use it in this prospectus.

If we issue debt securities at a discount from their principal amount, then, for purposes of calculating the aggregate initial offering price of the offered securities issued under this prospectus, we will include only the initial offering price of the debt securities and not the principal amount of the debt securities.

We have summarized below the material provisions of the indenture, or indicated which material provisions will be described in the related prospectus supplement. The prospectus supplement relating to any particular securities offered will describe the specific terms of the securities, which may be in addition to or different from the general terms summarized in this prospectus. [We have included the form of the indenture as an exhibit to our registration statement of which this prospectus is a part, and it is incorporated into this prospectus by reference.] Because the summary in this prospectus and in any prospectus supplement does not contain all of the information that you may find useful, you should read the documents relating to the securities that are described in this prospectus or in any applicable prospectus supplement. Please read “Where You Can Find More Information” to find out how you can obtain a copy of those documents. References below to an “indenture” are references to the indenture, as supplemented, under which a particular series of debt securities is issued. As used under this caption, the term “debt securities” includes the debt securities being offered by this prospectus and all other debt securities issued by us under the indenture.

General

The indenture:

- does not limit the amount of debt securities that we may issue;
- allows us to issue debt securities in one or more series;
- does not require us to issue all of the debt securities of a series at the same time; and
- allows us to reopen a series to issue additional debt securities without the consent of the holders of the debt securities of such series.

The prospectus supplement for each offering of debt securities will provide the following terms, where applicable:

- the title of the debt securities and whether they are senior, senior subordinated or subordinated debt securities;
- the aggregate principal amount of the debt securities being offered and any limit on their aggregate principal amount, and, if the series is to be issued at a discount from its face amount, the method of computing the accretion of such discount;
- the price at which the debt securities will be issued, expressed as a percentage of the principal and, if other than the full principal amount thereof, the portion of the principal amount thereof payable upon declaration of acceleration of the maturity thereof or, if applicable, the portion of the principal amount of such debt

securities that is convertible into common stock or preferred stock or the method by which any such portion shall be determined;

- if convertible, the terms on which such debt securities are convertible, including the initial conversion price or rate or the method of calculation, how and when the conversion price or exchange ratio may be adjusted, whether conversion or exchange is mandatory, at the option of the holder or at our option, the conversion or exchange period, and any other provision in relation thereto, and any applicable limitations on the ownership or transferability of common stock or preferred stock received on conversion;
- the date or dates, or the method for determining the date or dates, on which the principal of the debt securities will be payable;
- the fixed or variable interest rate or rates of the debt securities, or the method by which the interest rate or rates is determined;
- the date or dates, or the method for determining the date or dates, from which interest will accrue;
- the dates on which interest will be payable;
- the record dates for interest payment dates, or the method by which we will determine those dates;
- the persons to whom interest will be payable;
- the basis upon which interest will be calculated if other than that of a 360-day year of twelve 30-day months;
- any collateral securing the performance of our obligations under the debt securities;
- the place or places where the principal of, premium, if any, and interest on, the debt securities will be payable;
- where the debt securities may be surrendered for registration of transfer or conversion or exchange;
- where notices or demands to or upon us in respect of the debt securities and the applicable indenture may be served;
- any provisions regarding our right to redeem or purchase debt securities or the right of holders to require us to redeem or purchase debt securities;
- any right or obligation we have to redeem, repay or purchase the debt securities pursuant to any sinking fund or analogous provision;
- the currency or currencies (including any composite currency) in which the debt securities are denominated and payable if other than United States dollars, and the currency or currencies (including any composite currency) in which principal, premium, if any, and interest, if any, will be payable, and if such payments may be made in a currency other than that in which the debt securities are denominated, the manner for determining such payments, including the time and manner of determining the exchange rate between the currency in which such securities are denominated and the currency in which such securities or any of them may be paid, and any additions to, modifications of or deletions from the terms of the debt securities to provide for or to facilitate the issuance of debt securities denominated or payable in a currency other than U.S. dollars;
- whether the amount of payments of principal of, premium, if any, or interest on, the debt securities may be determined according to an index, formula or other method and how such amounts will be determined;
- whether the debt securities will be in registered form, bearer form or both, and the terms of these forms;

- whether the debt securities will be issued in whole or in part in the form of a global security and, if applicable, the identity of the depositary for such global security;
- any provision for electronic issuance of the debt securities or issuance of the debt securities in uncertificated form;
- whether and upon what terms the debt securities of such series may be defeased or discharged, if different from the provisions set forth in the indenture for the series to which the supplemental indenture or authorizing resolution relates;
- any provisions granting special rights to holders of securities upon the occurrence of such events as specified in the applicable prospectus supplement;
- any deletions from, modifications of, or additions to our events of default or covenants or other provisions set forth in the indenture for the series to which the supplemental indenture or authorizing resolution relates; and
- any other material terms of the debt securities, which may be different from the terms set forth in this prospectus.

We may issue debt securities at a discount below their principal amount and provide for less than the entire principal amount thereof to be payable upon declaration of acceleration of the maturity of the debt securities. We refer to any such debt securities throughout this prospectus as “original issue discount securities.” The applicable prospectus supplement will describe the United States federal income tax consequences and other relevant considerations applicable to original issue discount securities.

Neither the DGCL nor our governing instruments define the term “substantially all” as it relates to the sale of assets. Additionally, Delaware cases interpreting the term “substantially all” rely upon the facts and circumstances of each particular case. Consequently, to determine whether a sale of “substantially all” of our assets has occurred, a holder of debt securities must review the financial and other information that we have disclosed to the public.

The applicable prospectus supplement will also describe any material covenants to which a series of debt securities will be subject and the applicability of those covenants to any of our subsidiaries to be restricted thereby, which are referred to herein as “restricted subsidiaries.” The applicable prospectus supplement will also describe provisions for restricted subsidiaries to cease to be restricted by those covenants.

Events of Default

Unless the applicable prospectus supplement states otherwise, when we refer to “events of default” as defined in the indentures with respect to any series of debt securities, we mean:

- our failure to pay interest on any debt security of such series when the same becomes due and payable and the continuance of any such failure for a period of 30 days;
- our failure to pay the principal or premium of any debt security of such series when the same becomes due and payable at maturity, upon acceleration, redemption or otherwise;
- our failure or the failure of any restricted subsidiary to comply with any of its agreements or covenants in, or provisions of, the debt securities of such series or the indenture (as they relate thereto) and such failure continues for a period of 60 days after our receipt of notice of the default from the trustee or from the holders of at least 25 percent in aggregate principal amount of the then outstanding debt securities of that series (except in the case of a default with respect to the provisions of the indenture regarding the consolidation, merger, sale, lease, conveyance or other disposition of all or substantially all of the assets of us (or any other provision specified in the applicable supplemental indenture or authorizing resolution), which will constitute an event of default with notice but without passage of time); or

- certain events of bankruptcy, insolvency or reorganization occur with respect to Neurogene or any restricted subsidiary of Neurogene that is a significant subsidiary (as defined in the indenture).

If an event of default occurs and is continuing with respect to debt securities of any series outstanding, then the trustee or the holders of 25% or more in principal amount of the outstanding debt securities of that series will have the right to declare the principal amount of all the debt securities of that series to be due and payable immediately. However, the holders of at least a majority in principal amount of outstanding debt securities of such series may rescind and annul such declaration and its consequences, except an acceleration due to nonpayment of principal or interest on such series, if the rescission would not conflict with any judgment or decree and if all existing events of default with respect to such series have been cured or waived.

The indenture also provides that the holders of at least a majority in principal amount of the outstanding debt securities of any series, by notice to the trustee, may, on behalf of all holders, waive any existing default and its consequences with respect to such series of debt securities, other than any event of default in payment of principal or interest.

The indenture will require the trustee to give notice to the holders of debt securities within 90 days after the trustee obtains knowledge of a default that has occurred and is continuing. However, the trustee may withhold notice to the holders of any series of debt securities of any default, except a default in payment of principal or interest, if any, with respect to such series of debt securities, if the trustee considers it in the interest of the holders of such series of debt securities to do so.

The holders of a majority of the outstanding principal amount of the debt securities of any series will have the right to direct the time, method and place of conducting any proceedings for any remedy available to the trustee with respect to such series, subject to limitations specified in the indenture.

Amendment, Supplement and Waiver

Without notice to or the consent of any holder, we and the trustee may amend or supplement the indenture or the debt securities of a series:

- to cure any ambiguity, omission, defect or inconsistency;
- to comply with the provisions of the indenture regarding the consolidation, merger, sale, lease, conveyance or other disposition of all or substantially all of our assets;
- to provide that specific provisions of the indenture shall not apply to a series of debt securities not previously issued or to make a change to specific provisions of the indenture that only applies to any series of debt securities not previously issued or to additional debt securities of a series not previously issued;
- to create a series and establish its terms;
- to provide for uncertificated debt securities in addition to or in place of certificated debt securities;
- to release a guarantor in respect of any series which, in accordance with the terms of the indenture applicable to such series, ceases to be liable in respect of its guarantee;
- to add a guarantor subsidiary in respect of any series of debt securities;
- to secure any series of debt securities;
- to add to the covenants of Neurogene for the benefit of the holders or surrender any right or power conferred upon Neurogene;
- to appoint a successor trustee with respect to the securities;
- to comply with requirements of the SEC in order to effect or maintain the qualification of the indenture under the Trust Indenture Act of 1939, as amended (the “Trust Indenture Act”);

- to make any change that does not adversely affect the rights of holders; or
- to conform the provisions of the indenture to the final offering document in respect of any series of debt securities.

The indenture will provide that we and the trustee may amend or supplement any provision of the debt securities of a series or of the indenture relating to such series with the written consent of the holders of at least a majority in principal amount of the outstanding debt securities of such series. However, without the consent of each holder of a debt security the terms of which are directly amended, supplemented or waived, an amendment, supplement or waiver may not:

- reduce the amount of debt securities of such series whose holders must consent to an amendment, supplement or waiver;
- reduce the rate of or extend the time for payment of interest, including defaulted interest;
- reduce the principal of or extend the fixed maturity of any debt security or alter the provisions with respect to redemptions or mandatory offers to repurchase debt securities of a series in a manner adverse to holders;
- make any change that adversely affects any right of a holder to convert or exchange any debt security into or for shares of our common stock or other securities, cash or other property in accordance with the terms of such security;
- modify the ranking or priority of the debt securities of the relevant series;
- release any guarantor of any series from any of its obligations under its guarantee or the indenture otherwise than in accordance with the terms of the indenture;
- make any change to any provision of the indenture relating to the waiver of existing defaults, the rights of holders to receive payment of principal and interest on the debt securities, or to the provisions regarding amending or supplementing the indenture or the debt securities of a particular series with the written consent of the holders of such series, except to increase the percentage required for modification or waiver or to provide for consent of each affected holder of debt securities of such series;
- waive a continuing default or event of default in the payment of principal of or interest on the debt securities; or
- make any debt security payable at a place or in money other than that stated in the debt security, or impair the right of any holder of a debt security to bring suit as permitted by the indenture.

The holders of a majority in aggregate principal amount of the outstanding debt securities of such series may, on behalf of all holders of debt securities of that series, waive any existing default under, or compliance with, any provision of the debt securities of a particular series or of the indenture relating to a particular series of debt securities, other than any event of default in payment of interest or principal.

Defeasance

The indenture will permit us to terminate all our respective obligations under the indenture as they relate to any particular series of debt securities, other than the obligation to pay interest, if any, on and the principal of the debt securities of such series and certain other obligations, at any time by:

- depositing in trust with the trustee, under an irrevocable trust agreement, money or government obligations in an amount sufficient to pay principal of and interest, if any, on the debt securities of such series to their maturity or redemption; and
- complying with other conditions, including delivery to the trustee of an opinion of counsel to the effect that holders will not recognize income, gain or loss for federal income tax purposes as a result of our exercise of

such right and will be subject to federal income tax on the same amount and in the same manner and at the same times as would have been the case otherwise.

The indenture will also permit us to terminate all of our respective obligations under the indenture as they relate to any particular series of debt securities, including the obligations to pay interest, if any, on and the principal of the debt securities of such series and certain other obligations, at any time by:

- depositing in trust with the trustee, under an irrevocable trust agreement, money or government obligations in an amount sufficient to pay principal and interest, if any, on the debt securities of such series to their maturity or redemption; and
- complying with other conditions, including delivery to the trustee of an opinion of counsel to the effect that (A) we have received from, or there has been published by, the Internal Revenue Service a ruling, or (B) since the date such series of debt securities were originally issued, there has been a change in the applicable federal income tax law, in either case to the effect that, and based thereon such opinion of counsel shall state that, holders will not recognize income, gain or loss for federal income tax purposes as a result of our exercise of such right and will be subject to federal income tax on the same amount and in the same manner and at the same times as would have been the case otherwise.

In addition, the indenture will permit us to terminate substantially all our respective obligations under the indenture as they relate to a particular series of debt securities by depositing with the trustee money or government obligations sufficient to pay all principal and interest on such series at its maturity or redemption date if the debt securities of such series will become due and payable at maturity within one year or are to be called for redemption within one year of the deposit.

Transfer and Exchange

A holder will be able to transfer or exchange debt securities only in accordance with the indenture. The registrar may require a holder, among other things, to furnish appropriate endorsements and transfer documents, and to pay any taxes and fees required by law or permitted by the indenture.

Concerning the Trustee

The indenture will contain limitations on the rights of the trustee, should it become our creditor, to obtain payment of claims in specified cases or to realize on property received in respect of any such claim as security or otherwise. The indenture will permit the trustee to engage in other transactions; however, if it acquires any conflicting interest, it must eliminate such conflict or resign.

The indenture will provide that in case an event of default occurs and is not cured, the trustee will be required, in the exercise of its power, to use the degree of care of a prudent person in similar circumstances in the conduct of such person's own affairs. The trustee shall be under no obligation to exercise any of the rights or powers vested in it by the indenture at the request or direction of any of the holders pursuant to the indenture, unless such holders shall have offered to the trustee security or indemnity satisfactory to the trustee against the costs, expenses and liabilities which might be incurred by it in compliance with such request or direction.

No Recourse Against Others

The indenture will provide that there is no recourse under any obligation, covenant or agreement in the applicable indenture or with respect to any debt security against any of our or our successor's past, present or future stockholders, employees, officers or directors.

Governing Law

The laws of the State of New York will govern the indenture and the debt securities.

Warrants

We may issue warrants for the purchase of common stock, preferred stock and/or debt securities in one or more series, from time to time. We may issue warrants independently or together with common stock, preferred stock and/or debt securities, and the warrants may be attached to or separate from those securities.

If we issue warrants, they will be evidenced by warrant agreements or warrant certificates issued under one or more warrant agreements, which are contracts between us and an agent for the holders of the warrants. We urge you to read the prospectus supplement related to any series of warrants we may offer, as well as the complete warrant agreement and warrant certificate that contain the terms of the warrants. If we issue warrants, forms of warrant agreements and warrant certificates relating to warrants for the purchase of common stock, preferred stock and debt securities will be incorporated by reference into the registration statement of which this prospectus is a part from reports we would subsequently file with the SEC.

Units

We may issue units consisting of any combination of the other types of securities offered under this prospectus in one or more series. We may evidence each series of units by unit certificates that we will issue under a separate agreement. We may enter into unit agreements with a unit agent. Each unit agent will be a bank or trust company that we select. We will indicate the name and address of the unit agent in the applicable prospectus supplement relating to a particular series of units.

The following description, together with the additional information included in any applicable prospectus supplement, summarizes the general features of the units that we may offer under this prospectus. You should read any prospectus supplement and any free writing prospectus that we may authorize to be provided to you related to the series of units being offered, as well as the complete unit agreements that contain the terms of the units. Specific unit agreements will contain additional important terms and provisions and we will file as an exhibit to the registration statement of which this prospectus is a part, or will incorporate by reference from another report that we file with the SEC, the form of each unit agreement relating to units offered under this prospectus.

If we offer any units, certain terms of that series of units will be described in the applicable prospectus supplement, including, without limitation, the following, as applicable:

- the title of the series of units;
- identification and description of the separate constituent securities comprising the units;
- the price or prices at which the units will be issued;
- the date, if any, on and after which the constituent securities comprising the units will be separately transferable;
- a discussion of certain United States federal income tax considerations applicable to the units; and
- any other terms of the units and their constituent securities.

PLAN OF DISTRIBUTION

We may sell the securities from time to time pursuant to underwritten public offerings, negotiated transactions, block trades or a combination of these methods. We may sell the securities to or through underwriters or dealers, through agents, or directly to one or more purchasers. We may distribute securities from time to time in one or more transactions:

- at a fixed price or prices, which may be changed;
- at market prices prevailing at the time of sale;
- at prices related to such prevailing market prices; or
- at negotiated prices.

We may also sell equity securities covered by this registration statement in an “at the market offering” as defined in Rule 415 under the Securities Act. Such offering may be made into an existing trading market for such securities in transactions at other than a fixed price, either:

- on or through the facilities of Nasdaq or any other securities exchange or quotation or trading service on which such securities may be listed, quoted or traded at the time of sale; and/or
- to or through a market maker otherwise than on Nasdaq or such other securities exchanges or quotation or trading services.

Such at the market offerings, if any, may be conducted by underwriters acting as principal or agent.

A prospectus supplement or supplements (and any related free writing prospectus that we may authorize to be provided to you) will describe the terms of the offering of the securities, including, to the extent applicable:

- the name or names of any underwriters, dealers or agents, if any;
- the purchase price of the securities and the proceeds we will receive from the sale;
- any options under which underwriters may purchase additional securities from us;
- any agency fees or underwriting discounts and other items constituting agents’ or underwriters’ compensation;
- any public offering price;
- any discounts or concessions allowed or re-allowed or paid to dealers; and
- any securities exchange or market on which the securities may be listed.

Only underwriters named in the prospectus supplement are underwriters of the securities offered by the prospectus supplement.

If underwriters are used in the sale, they will acquire the securities for their own account and may resell the securities from time to time in one or more transactions at a fixed public offering price or at varying prices determined at the time of sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. We may offer the securities to the public through underwriting syndicates represented by managing underwriters or by underwriters without a syndicate. Subject to certain conditions, the underwriters will be obligated to purchase all of the securities offered by the prospectus supplement. Any public offering price and any discounts or concessions allowed or re-allowed or paid to dealers may change from time to time. We may use underwriters with whom we have a material relationship. We will describe in the prospectus supplement, naming the underwriter, the nature of any such relationship.

We may sell securities directly or through agents we designate from time to time. We will name any agent involved in the offering and sale of securities, and we will describe any commissions we will pay the agent in the prospectus supplement. Unless the prospectus supplement states otherwise, our agent will act on a best-efforts basis for the period of its appointment.

We may authorize agents or underwriters to solicit offers by certain types of institutional investors to purchase securities from us at the public offering price set forth in the prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on a specified date in the future. We will describe the conditions to these contracts and the commissions we must pay for solicitation of these contracts in the prospectus supplement.

We may provide agents and underwriters with indemnification against civil liabilities related to offerings pursuant to this prospectus, including liabilities under the Securities Act, or contribution with respect to payments that the agents or underwriters may make with respect to these liabilities. Agents and underwriters may engage in transactions with, or perform services for, us in the ordinary course of business.

All securities we offer, other than shares of our common stock, will be new issues of securities, and all securities we offer, other than our common stock, will have no established trading market. Any underwriters may make a market in these securities, but will not be obligated to do so and may discontinue any market making at any time without notice. We cannot guarantee the liquidity of the trading markets for any securities.

Any underwriter may engage in overallotment, stabilizing transactions, short covering transactions and penalty bids in accordance with Regulation M under the Exchange Act. Overallotment involves sales in excess of the offering size, which create a short position. Stabilizing transactions permit bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum. Short covering transactions involve purchases of the securities in the open market after the distribution is completed to cover short positions. Penalty bids permit the underwriters to reclaim a selling concession from a dealer when the securities originally sold by the dealer are purchased in a stabilizing or covering transaction to cover short positions. Those activities may cause the price of the securities to be higher than it would otherwise be. If commenced, the underwriters may discontinue any of the activities at any time. These transactions may be effected on any exchange or over-the-counter market or otherwise.

Any underwriters who are qualified market makers on Nasdaq may engage in passive market making transactions in the securities on Nasdaq in accordance with Rule 103 of Regulation M, during the business day prior to the pricing of the offering, before the commencement of offers or sales of the securities. Passive market makers must comply with applicable volume and price limitations and must be identified as passive market makers. In general, a passive market maker must display its bid at a price not in excess of the highest independent bid for such security; if all independent bids are lowered below the passive market maker's bid, however, the passive market maker's bid must then be lowered when certain purchase limits are exceeded. Passive market making may stabilize the market price of the securities at a level above that which might otherwise prevail in the open market and, if commenced, may be discontinued at any time.

LEGAL MATTERS

Certain legal matters, including the legality of the securities offered, will be passed upon for us by Gibson, Dunn & Crutcher LLP, San Francisco, California. Additional legal matters may be passed upon for us or any underwriters, dealers or agents, by counsel that we will name in the applicable prospectus supplement.

EXPERTS

The financial statements of Neurogene Inc. as of December 31, 2024 and 2023, and for each of the two years in the period ended December 31, 2024, incorporated by reference in this prospectus, have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report. Such financial statements are incorporated by reference in reliance upon the report of such firm given their authority as experts in accounting and auditing.

INFORMATION INCORPORATED BY REFERENCE

This prospectus incorporates by reference important business and financial information about the Company that is not included in or delivered with this document. The information incorporated by reference is considered to be part of this prospectus, and the SEC allows us to “incorporate by reference” the information we file with it, which means that we can disclose important information to you by referring you to those documents instead of having to repeat the information in this prospectus. Any information referenced in this way is considered part of this prospectus. Any subsequent information filed with the SEC will automatically be deemed to update and supersede the information in this prospectus and in our other filings with the SEC. We are incorporating by reference the documents listed below:

- our Annual Report on [Form 10-K](#) for the fiscal year ended December 31, 2024, filed with the SEC on March 23, 2025 (our “*Annual Report*”); and
- the description of our securities contained in [Exhibit 4.3](#) to our Annual Report, as may be further amended by any amendments or reports filed for the purposes of updating this description.

Notwithstanding the foregoing, information furnished under Items 2.02 and 7.01 of any Current Report on Form 8-K, including the related exhibits under Item 9.01, is not incorporated by reference in this prospectus or any prospectus supplement.

We also incorporate by reference into this prospectus any further filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act (other than portions deemed to have been “furnished” and not filed with the SEC, including those made pursuant to Item 2.02 or Item 7.01 of Form 8-K or other information), including all filings filed after the date hereof and prior to the completion of the offering of all securities under this prospectus.

We will furnish without charge to you, on written or oral request, a copy of any or all of the documents incorporated by reference in this prospectus, including exhibits to these documents. You should direct any requests for documents to Neurogene Inc., 535 W 24th St., 5th Floor, New York, NY 10011, telephone: (855) 508-3568. You also may access these filings on our website at www.neurogene.com. We do not incorporate the information on our website into this prospectus and you should not consider any information on, or that can be accessed through, our website as part of this prospectus (other than those filings with the SEC that we specifically incorporate by reference into this prospectus).

Any statement contained in a document incorporated or deemed to be incorporated by reference in this prospectus will be deemed modified, superseded or replaced for purposes of this prospectus to the extent that a statement contained in this prospectus modifies, supersedes or replaces such statement.

WHERE YOU CAN FIND MORE INFORMATION

We are subject to the informational requirements of the Exchange Act and are required to file annual, quarterly and other reports, proxy statements and other information with the SEC. The SEC maintains an Internet website (<http://www.sec.gov>) that contains reports, proxy and information statements, and various other information about registrants, like us, that file electronically with the SEC.

Information about us is also available at our website at <http://www.neurogene.com>. You may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. However, the information on our website is not a part of this prospectus and is not incorporated by reference into this prospectus.

We have filed with the SEC this registration statement relating to the securities covered by this prospectus. This prospectus is a part of the registration statement and does not contain all of the information in the registration statement. Whenever a reference is made in this prospectus to a contract or other document of ours, please be aware that the reference is only a summary and that you should refer to the exhibits that are part of the registration statement for a copy of the contract or other document. You may review a copy of the registration statement through the SEC's website or our website.



Neurogene Inc.

Shares of Common Stock
Pre-Funded Warrants to Purchase Shares of Common Stock

PROSPECTUS SUPPLEMENT

Joint Bookrunning Managers

Leerink Partners

Stifel

Guggenheim Securities

LifeSci Capital

William Blair

, 2026
