

PROSPECTUS



Up to 268,096 Shares of Common Stock

This prospectus relates to the resale of up to 268,096 shares of common stock, par value \$0.0001 per share (the "Shares"), of REGENXBIO Inc. (the "Company," "we," "our" or "us") by the selling stockholder named in this prospectus (the "Selling Stockholder"). The Shares are issuable to the Selling Stockholder upon the exercise of a warrant to purchase up to 268,096 Shares (the "Warrant") at an exercise price of \$14.92 per share, which Warrant was issued in a private placement in connection with the Loan Agreement, dated May 16, 2025, by and between REGENXBIO RS LLC, a wholly owned subsidiary of ours, and an affiliate of HealthCare Royalty Management, LLC.

We are registering the resale of the Shares on behalf of the Selling Stockholder, which it may offer and sell from time to time pursuant to this prospectus. We are not selling any securities under this prospectus and will not receive any of the proceeds from the sale of the Shares by the Selling Stockholder. We will receive proceeds of up to approximately \$4.0 million upon the exercise in full of the Warrant by the Selling Stockholder for cash. For more information related to the Selling Stockholder, please refer to the section of this prospectus titled "*The Selling Stockholder*."

The Selling Stockholder may sell the Shares at fixed prices, at prevailing market prices at the time of sale or at prices negotiated with the purchasers to or through underwriters, broker-dealers, agents, or through any other means described in the section of this prospectus titled "*Plan of Distribution*." The Selling Stockholder will pay any discounts, commissions, and fees of underwriters, selling brokers, dealer managers or similar securities industry professionals incurred by such Selling Stockholder in disposing of the Shares covered by this prospectus. We will bear all costs, expenses and fees in connection with the registration of the Shares.

Our common stock is listed on The Nasdaq Global Select Market under the symbol "RGNX." On June 24, 2025, the last reported sale price of our common stock was \$8.56.

Investing in our securities involves significant risks. Before buying our securities, you should carefully read and consider the risks we describe in this prospectus and in any accompanying prospectus supplement, as well as the risk factors that are incorporated by reference into this prospectus and in any accompanying prospectus supplement from our filings made with the Securities and Exchange Commission. See "[Risk Factors](#)" beginning on page 3 of this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is June 25, 2025

TABLE OF CONTENTS

| | |
|---|----|
| SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS | ii |
| ABOUT THIS PROSPECTUS | 1 |
| THE COMPANY | 2 |
| RISK FACTORS | 3 |
| USE OF PROCEEDS | 4 |
| DESCRIPTION OF COMMON STOCK | 5 |
| THE SELLING STOCKHOLDER | 10 |
| PLAN OF DISTRIBUTION | 11 |
| LEGAL MATTERS | 14 |
| EXPERTS | 14 |
| WHERE YOU CAN FIND MORE INFORMATION | 14 |

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, each prospectus supplement and the information incorporated by reference in this prospectus contains “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 Securities Exchange Act of 1934, as amended (the “Exchange Act”), which are subject to the safe harbor created by those sections for such statements. These statements express a belief, expectation or intention, and are generally accompanied by words that convey projected future events or outcomes such as “anticipate,” “assume,” “believe,” “continue,” “could,” “design,” “estimate,” “expect,” “forecast,” “goal,” “intend,” “may,” “objective,” “plan,” “position,” “potential,” “predict,” “project,” “seek,” “should,” “will,” “would” or variations of such words or by similar expressions. We have based these forward-looking statements on our current expectations, estimates and assumptions and analyses in light of our experience and our perception of historical trends, current conditions and expected future developments, as well as other factors we believe are appropriate under the circumstances. However, whether actual results and developments will conform with our expectations and predictions is subject to a number of risks, uncertainties, assumptions and other important factors, including, but not limited to:

- our ability to establish and maintain development partnerships, including our collaboration with AbbVie Inc. to develop and commercialize ABBV-RGX-314 and our collaboration with Nippon Shinyaku Co., Ltd. to develop and commercialize RGX-121 and RGX-111;
- our ability to obtain and maintain regulatory approval of our product candidates, and the labeling for any approved products;
- the timing of enrollment, commencement, completion and the success of our AAVIATE[®], AFFINITY BEYOND[®], AFFINITY DUCHENNE[®], ALTITUDE[®], ASCENT[™], ATMOSPHERE[®] and CAMPSITE[®] clinical trials;
- the timing of commencement and completion and the success of preclinical studies conducted by us and our development partners;
- the timely development and launch of new products;
- the scope, progress, expansion and costs of developing and commercializing our product candidates;
- our ability to obtain, maintain and enforce intellectual property protection for our product candidates and technology, and defend against third-party intellectual property-related claims;
- our expectations regarding the development and commercialization of product candidates currently being developed by third parties that utilize our technology;
- our anticipated growth strategies;
- our expectations regarding competition;
- the anticipated trends and challenges in our business and the market in which we operate;
- our ability to attract or retain key personnel;
- the size and growth of the potential markets for our product candidates and the ability to serve those markets;
- the rate and degree of market acceptance of any of our products that are approved;
- our expectations regarding our expenses and revenue;
- our expectations regarding our need for additional financing and our ability to obtain additional financing;
- our expectations regarding the outcome of legal proceedings;
- our expectations regarding regulatory developments in the United States and foreign countries;

Table of Contents

- the impact of any government-imposed tariffs or other trade barriers on cost of goods and services, particularly related to partnered product candidates; and
- changes in the financial markets and banking system that may affect the availability and terms on which we may obtain financing and our ability to accurately predict how long our existing cash resources will be sufficient to fund our anticipated operating expenses.

You should carefully read the section of this prospectus titled “*Risk Factors*,” as well as both the “*Risk Factors*” and “*Management’s Discussion and Analysis of Financial Condition and Results of Operations*” sections included in our quarterly and annual filings with the U.S. Securities and Exchange Commission (the “SEC”), that are incorporated herein by reference, for a discussion of the risks, uncertainties, assumptions and other important factors that could cause our actual results or developments to differ materially and adversely from those projected in the forward-looking statements. The actual results or developments anticipated may not be realized or, even if substantially realized, they may not have the expected consequences to or effects on us or our businesses or operations. Such statements are not guarantees of future performance, and actual results or developments may differ materially and adversely from those projected in the forward-looking statements. These forward-looking statements made by us in this prospectus, or in the information incorporated by reference herein, speak only as of the date of the respective document. Except as required by law, we disclaim any duty to update any forward-looking statements, whether as a result of new information, future events, or otherwise.

ABOUT THIS PROSPECTUS

This prospectus provides you with a general description of the Shares that may be resold by the Selling Stockholder. In certain circumstances, we may provide a prospectus supplement or free writing prospectus that will contain specific information about the terms of a particular offering by the Selling Stockholder. We also may provide a prospectus supplement to add, update or change information contained in this prospectus. To the extent there is a conflict between the information contained in this prospectus and in any prospectus supplement or free writing prospectus, you should rely on the information in the prospectus supplement or free writing prospectus, provided that 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 in this prospectus or any prospectus supplement—the statement in the later-dated document modifies or supersedes the earlier statement.

You should read this prospectus together with the additional information about our company to which we refer you in the section of this prospectus titled “*Where You Can Find More Information.*”

Neither we nor the Selling Stockholder has authorized anyone to provide you with information that is in addition to or different from that contained in this prospectus. We take no responsibility for, and can provide no assurance as to the reliability of, any information that others may provide. We will be offering to sell, and seeking offers to buy, our securities only in jurisdictions where such offers and sales are permitted. You should not assume that the information in this prospectus or any prospectus supplement or free writing prospectus that we have prepared or authorized is accurate as of any date other than the date of those documents, or that any information in documents that we have incorporated by reference is accurate except as of the date of such document, regardless of the time of delivery of this prospectus or any prospectus supplement or free writing prospectus, or the sale of any security hereunder. You should not consider this prospectus to be an offer or solicitation relating to the Shares in any jurisdiction in which such an offer or solicitation relating to the Shares is not authorized. Furthermore, you should not consider this prospectus to be an offer or solicitation relating to the Shares if the person making the offer or solicitation is not qualified to do so, or if it is unlawful for you to receive such an offer or solicitation.

We note that the representations, warranties, covenants and agreements made in any agreement or instrument that is filed as an exhibit to any document that is incorporated by reference herein were made solely for the benefit of the parties to such agreement or instrument, including in some cases, for the purpose of allocating risk among the parties to such agreements and instruments, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties and 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.

Unless the context otherwise requires, throughout this prospectus, the words “REGENXBIO,” “Company” “we,” “our” or “us,” refer to REGENXBIO Inc.

AAVIATE, AFFINITY BEYOND, AFFINITY DUCHENNE, ALTITUDE, ATMOSPHERE, CAMPSITE, NAV, NAVXpress, NAVXcell, REGENXBIO and the REGENXBIO logos are our registered trademarks. Any other trademarks appearing in this prospectus are the property of their respective holders.

THE COMPANY

We are a leading clinical-stage biotechnology company seeking to improve lives through the curative potential of gene therapy. Our investigational gene therapies are designed to deliver functional genes to address genetic defects in cells, enabling the production of therapeutic proteins or antibodies that are intended to impact disease. Through a single administration, gene therapy could potentially alter the course of disease significantly and deliver improved patient outcomes with long-lasting effects.

Our investigational gene therapies use adeno-associated virus (AAV) vectors from our proprietary gene delivery platform, which we call our NAV[®] Technology Platform. AAV vectors are non-replicating viral delivery vehicles that are not known to cause disease. Our NAV Technology Platform consists of exclusive rights to a large portfolio of AAV vectors (NAV Vectors), including commonly used AAV8 and AAV9. We believe this platform forms a strong foundation for our current clinical-stage programs and, with our ongoing research and development, we expect to continue to expand our platform and pipeline of potential AAV vector-based gene therapies. We refer to commercial and investigational AAV vector-based gene therapies as AAV Therapeutics. Our NAV Technology Platform is the foundation for commercial and investigational AAV Therapeutics that have treated thousands of patients through our clinical pipeline and NAV licensees.

Our principal executive offices are located at 9804 Medical Center Drive, Rockville, Maryland 20850, and our telephone number is (240) 552-8181.

RISK FACTORS

Investing in our securities involves risk. You should carefully read and consider the specific risks discussed or incorporated by reference into this prospectus, together with all the other information contained in this prospectus or incorporated by reference into this prospectus, including the risks, uncertainties and assumptions discussed under the “*Risk Factors*” section in any documents we file with the SEC, and specifically, you should read and consider the “*Risk Factors*” section found in our most recent Annual Report on Form 10-K, our Quarterly Reports on Form 10-Q and our Current Reports on Form 8-K. These risk factors may be amended, supplemented or superseded from time to time by other reports we file with the SEC in the future or by a prospectus supplement relating to a particular offering of our securities. These risks and uncertainties are not the only risks and uncertainties we face. Additional risks and uncertainties not presently known to us, or that we currently view as immaterial, may also impair our business. If any of the risks or uncertainties described in our SEC filings or any prospectus supplement, or if any additional risks or uncertainties actually occur, our business, financial condition and results of operations could be materially and adversely affected. In that case, the trading price of our securities could decline and you might lose all or part of your investment.

USE OF PROCEEDS

We will not receive any proceeds from the sale of the Shares. All proceeds from the sale of the Shares will be for the account of the Selling Stockholder. However, the Company will receive the proceeds of any cash exercise of the Warrant. If the Warrant is exercised in full for cash, we would receive aggregate proceeds of approximately \$4.0 million.

We will bear all other costs, fees and expenses incurred in effecting the registration of the Shares covered by this prospectus, including without limitation, registration, qualification, filing fees, Nasdaq listing fees and fees and expenses of our counsel and our accountants. The Selling Stockholder will pay any discounts, commissions, and fees of underwriters, selling brokers, dealer managers or similar securities industry professionals incurred by such Selling Stockholder in disposing of the Shares covered by this prospectus.

DESCRIPTION OF CAPITAL STOCK

The following description is a general summary of the terms of the shares of common stock and shares of preferred stock that we may issue. The description below, and in any prospectus supplement, does not include all of the terms of the shares of common stock or shares of preferred stock and should be read together with our restated certificate of incorporation and amended and restated bylaws, copies of which have been filed previously with the SEC. For more information on how you can obtain copies of our restated certificate of incorporation and amended and restated bylaws, see the section titled “*Where You Can Find More Information.*”

Authorized Capital Stock

Our authorized capital stock consists of 110,000,000 shares, of which 100,000,000 shares are designated as common stock, par value \$0.0001 per share, and 10,000,000 shares are designated as preferred stock, par value \$0.0001 per share. The outstanding shares of our common stock are fully paid and non-assessable. As of June 9, 2025, we had 50,388,693 shares of common stock outstanding held of record by five stockholders. No shares of preferred stock were outstanding as of such date.

Dividend Rights

Subject to preferences that may apply to shares of preferred stock outstanding at the time, the holders of outstanding shares of our common stock are entitled to receive dividends out of assets legally available at the times and in the amounts that our board of directors may determine from time to time.

Preemptive and Conversion Rights

Holders of common stock have no preemptive or conversion rights or other subscription rights.

Redemption and Sinking Fund Rights

There are no redemption or sinking fund provisions applicable to our common stock.

Liquidation Rights

Upon our liquidation, dissolution or winding-up, the holders of common stock are entitled to share ratably in all assets remaining after payment of all liabilities and the liquidation preferences of any outstanding preferred stock.

Voting Rights

Each holder of common stock is entitled to one vote per share on all matters submitted to a vote of stockholders. Notwithstanding the previous sentence, unless otherwise provided by law holders of common stock are not entitled to vote on any amendment to our restated certificate of incorporation that relates solely to the terms of any preferred stock if the holders of such preferred stock are entitled to vote on such amendment. Except as otherwise provided by law, our restated certificate of incorporation or our amended and restated bylaws, all matters other than the election of directors shall be decided by the affirmative vote of a majority of the voting power of the outstanding voting stock that is present in person or represented by proxy at a meeting of stockholders and entitled to vote thereon. Except as otherwise set forth in the restated certificate of incorporation with respect to the right of holders of any series of preferred stock or any other series or class of stock to elect additional directors under specified circumstances, a plurality of votes cast shall elect directors.

We have not provided for cumulative voting in the election of directors.

The General Corporation Law of the State of Delaware, or the Delaware General Corporation Law, provides that holders of a class of stock will have the right to vote separately as a class on any proposal involving fundamental changes in the rights of the holders of that class of stock for proposals that adversely affect such holders.

[Table of Contents](#)

Anti-Takeover Effects of Delaware Law and Our Restated Certificate of Incorporation and Amended and Restated Bylaws

Delaware law, our restated certificate of incorporation and our amended and restated bylaws contain provisions that could make it more difficult to effect an acquisition of us by means of a tender offer, proxy contest or otherwise, or to remove our incumbent officers and directors. It is possible that these provisions could make it more difficult to accomplish, or could deter, transactions that stockholders otherwise consider to be in our or their best interest, including transactions which provide for payment of a premium over the market price for our shares.

These provisions, summarized below, are intended to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that the benefits of the increased protection of our potential ability to negotiate with the proponent of an unsolicited or unfriendly proposal to acquire or restructure us outweigh the disadvantages of discouraging these proposals because negotiation of these proposals could result in an improvement of their terms.

Delaware Business Combination Statute

We are subject to Section 203 of the Delaware General Corporation Law. Section 203 prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a period of three years following the time of the transaction in which the person or entity became an interested stockholder, unless:

- prior to that time, either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder is approved by the board of directors of the corporation;
- upon consummation of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the outstanding voting stock of the corporation, excluding for this purpose shares owned by persons who are directors and also officers of the corporation and by specified employee benefit plans; or
- at or after such time, the business combination is approved by the board of directors of the corporation and by the affirmative vote, and not by written consent, of at least 66 2/3% of the outstanding voting stock that is not owned by the interested stockholder.

For the purposes of Section 203, a “business combination” is broadly defined to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, pledge or other disposition of 10% or more of the assets of the corporation involving the interested stockholder;
- any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder, subject to limited exceptions;
- any transaction involving the corporation that has the effect of increasing the proportionate share of the stock of any class or series of the corporation beneficially owned by the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

An “interested stockholder” is a person who, together with affiliates and associates, owns or within the immediately preceding three years did own 15% or more of the corporation’s voting stock.

Undesignated Preferred Stock

The ability of our board of directors, without action by the stockholders, to issue up to 10,000,000 shares of undesignated preferred stock with voting or other rights or preferences as designated by our board of directors

[Table of Contents](#)

could impede the success of any attempt to change control of us. The existence of authorized but unissued shares of preferred stock may have the effect of deferring hostile takeovers or delaying changes in control or management of our company.

Stockholder Action by Written Consent; Stockholder Meetings

Our restated certificate of incorporation and amended and restated bylaws eliminate the right of stockholders to act by written consent without a meeting. As a result, a holder controlling a majority of our capital stock would not be able to amend our bylaws or remove directors without holding a meeting of our stockholders called in accordance with our amended and restated bylaws. Our restated certificate of incorporation and amended and restated bylaws provide that a special meeting of stockholders may be called only by our chairman of the board or our chief executive officer (or if there is no chief executive officer, the president), or by a resolution adopted by a majority of our board of directors. These provisions might delay the ability of our stockholders to force consideration of a proposal or for stockholders controlling a majority of our capital stock to take any action, including the removal of directors.

Requirements for Advance Notification of Stockholder Nominations and Proposals

Our amended and restated bylaws establish advance notice procedures with respect to stockholder proposals to be brought before a stockholder meeting and the nomination of candidates for election as directors, other than nominations made by or at the direction of the board of directors or a committee of the board of directors. These provisions could have the effect of delaying until the next stockholder meeting stockholder actions that are favored by the holders of a majority of our outstanding voting securities.

Staggered Board

Our board of directors is divided into three classes. The directors in each class will serve for a three-year term, one class being elected each year by our stockholders. This system of electing and removing directors may discourage a third party from making a tender offer or otherwise attempting to obtain control of us, because it generally makes it more difficult for stockholders to replace a majority of the directors.

Removal of Directors

Our restated certificate of incorporation provides that no member of our board of directors may be removed from office by our stockholders except for cause and, in addition to any other vote required by law, upon the approval of holders of at least two-thirds of the total voting power of all of our outstanding voting stock then entitled to vote in the election of directors.

Board of Directors Vacancies

Our restated certificate of incorporation and amended and restated bylaws authorize our board of directors to fill vacant directorships. In addition, the number of directors constituting our board of directors is set only by resolution adopted by a majority vote of our entire board of directors. These provisions will prevent a stockholder 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.

Stockholders Not Entitled to Cumulative Voting

Our restated certificate of incorporation does not permit stockholders to cumulate their votes in the election of directors. Accordingly, the holders of a majority of the outstanding shares of our common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they choose, other than any directors that holders of our preferred stock may be entitled to elect.

Table of Contents

Amendment of Charter and Bylaw Provisions

The amendment of any of the above provisions, except for the provision making it possible for our board of directors to issue preferred stock, would require approval by holders of at least two-thirds of the total voting power of all of our outstanding voting stock. In addition, the affirmative vote of the holders of at least two-thirds of the total voting power of all of our outstanding voting stock is required for stockholders to amend our amended and restated bylaws.

The provisions of Delaware law, our restated certificate of incorporation and our amended and restated bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions may also have the effect of preventing changes in the composition of our board and management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interests.

Choice of Forum

Our restated certificate of incorporation provides that the Court of Chancery of the State of Delaware (or, if the Court of Chancery does not have jurisdiction, the federal district court for the District of Delaware) will be the exclusive forum for any derivative action or proceeding brought on our behalf; any action asserting a breach of fiduciary duty; any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our restated certificate of incorporation or amended and restated bylaws; or any action asserting a claim against us that is governed by the internal affairs doctrine. Additionally, if the subject matter of any action within the scope of the preceding sentence is filed in a court other than a court located within the State of Delaware, or is a “foreign action” (as defined in our restated certificate of incorporation), in the name of any stockholder, such stockholder shall be deemed to have consented to (i) the personal jurisdiction of the state and federal courts located within the State of Delaware in connection with any action brought in any such court to enforce the preceding sentence and (ii) having service of process made upon such stockholder in any such action by service upon such stockholder’s counsel in the foreign action as agent for such stockholder.

Additionally, our restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States of America shall, to the fullest extent permitted by law, be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. Any person or entity purchasing or otherwise acquiring any interest in any of our securities shall be deemed to have notice of and consented to this provision.

The enforceability of similar choice of forum provisions in other companies’ certificates of incorporation has been challenged in legal proceedings, and it is possible that a court could find these types of provisions to be inapplicable or unenforceable.

Indemnification

Our restated certificate of incorporation includes provisions that limit the liability of our directors for monetary damages for breach of their fiduciary duty as directors, except for liability that cannot be eliminated under the Delaware General Corporation Law. Accordingly, our directors will not be personally liable for monetary damages for breach of their fiduciary duty as directors, except for liabilities:

- for any breach of the director’s duty of loyalty to us or our stockholders;
- for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law;
- for unlawful payments of dividends or unlawful stock repurchases or redemptions, as provided under Section 174 of the Delaware General Corporation Law; or
- for any transaction from which the director derived an improper personal benefit.

[Table of Contents](#)

Any amendment or repeal of these provisions will require the approval of the holders of shares representing at least two-thirds of the shares entitled to vote in the election of directors, voting as one class.

Our restated certificate of incorporation and amended and restated bylaws also provide that we will indemnify our directors and officers to the fullest extent permitted by Delaware law. Our amended and restated bylaws also permit us to purchase insurance on behalf of any officer, director, employee or other agent for any liability arising out of his or her actions as our officer, director, employee or agent, regardless of whether Delaware law would permit indemnification. We have entered into separate indemnification agreements with our directors and officers that require us, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors and to advance their expenses incurred as a result of any proceeding against them as to which they could be indemnified. We believe that the limitation of liability provision in our restated certificate of incorporation and the indemnification agreements facilitate our ability to continue to attract and retain qualified individuals to serve as directors and officers. The limitation of liability and indemnification provisions in our restated certificate of incorporation and amended and restated bylaws may discourage stockholders from bringing a lawsuit against directors for breach of their fiduciary duties. They may also reduce the likelihood of derivative litigation against directors and officers, even though an action, if successful, might benefit us and our stockholders. A stockholder's investment may be harmed to the extent we pay the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions.

Stock Exchange Listing

Our common stock is listed on The Nasdaq Global Select Market under the symbol "RGNX."

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare Trust Company, N.A.

THE SELLING STOCKHOLDER

We have prepared this prospectus to allow the Selling Stockholder to sell or otherwise dispose of, from time to time, up to 268,096 Shares of our common stock issuable upon the Selling Stockholder's exercise of the Warrant at an exercise price of \$14.92 per share, which Warrant was issued in connection with execution of a Loan Agreement, dated May 16, 2025, by and between REGENXBIO RS LLC, a wholly owned subsidiary of the Company, and an affiliate of HealthCare Royalty Management, LLC. We issued the Warrant on May 16, 2025 in a private placement conducted, in reliance upon Section 4(a)(2) of the Securities Act.

The following table sets forth the identity of the Selling Stockholder, the number of Shares and the percentage of Shares beneficially owned by the Selling Stockholder and its affiliates prior to this offering, the number of Shares that may be offered under this prospectus by the Selling Stockholder, and the number of shares of our Common Stock and the percentage of our Common Stock to be beneficially owned by the Selling Stockholder and its affiliates after the completion of this offering, assuming that all Shares offered hereunder are sold by the Selling Stockholder as contemplated herein. The number of Shares in the column "Maximum number of shares that may be offered" represents all of the Shares that the Selling Stockholder may offer under this prospectus. For purposes of the table below, the beneficial ownership amounts and percentages are based on a total of 50,388,693 shares of our common stock outstanding as of June 9, 2025.

Information about additional selling stockholders, if any, including their identities and the Shares to be registered on their behalf, may be set forth in a prospectus supplement, in a post-effective amendment or in filings that we make with the SEC under the Exchange Act, which are incorporated by reference in this prospectus. Information concerning the Selling Stockholder may change from time to time. Any changes to the information provided below will be set forth in a supplement to this prospectus, in a post-effective amendment or in filings we make with the SEC under the Exchange Act, which are incorporated by reference into this prospectus, if and when necessary.

| | Shares beneficially owned | | | | |
|---|---|------------|--|---|------------|
| | Shares beneficially owned prior to this offering ⁽¹⁾ | | Maximum number of shares that may be offered | Shares beneficially owned after this offering | |
| | Number | Percentage | | Number | Percentage |
| HCR RGNX ROYALTY SPV, LP ⁽²⁾ | 268,096 | * | 268,096 | 0 | - |

(1) For purposes of this table, a person is deemed to have "beneficial ownership" of any shares that are currently exercisable or exercisable within 60 days of the date of this prospectus in accordance with SEC rules.

(2) HealthCare Royalty Management, LLC is the investment manager for each of HCRX Master GP LLC ("Master GP") and HCR Stafford II GP, LLC ("Stafford II GP"). Master GP and Stafford II GP are the general partners of HCRX Investments HoldCo, L.P. and HCR Stafford Fund II, L.P., respectively, which collectively own 100% of the partnership interest in the Selling Stockholder. Clark B. Futch may be deemed to have investment discretion and voting power with respect to the shares held by the Selling Stockholder due to his role in directing the investment decisions of HealthCare Royalty Management LLC and through his service as Chief Executive Officer of Master GP and Stafford II GP. The address of the Selling Stockholder is c/o HCRX Investments HoldCo, L.P., 300 Atlantic Street, Suite 600, Stamford, CT 06901.

* Less than 1%.

PLAN OF DISTRIBUTION

The Selling Stockholder may, from time to time, offer some or all of the Shares by this prospectus. We will not receive any of the proceeds from the sale of the Shares by the Selling Stockholder. The Selling Stockholder will act independently of us in making decisions with respect to the timing, manner and size of each sale. We will bear all fees and expenses incident to our obligation to register the Shares.

The Selling Stockholder may sell all or a portion of the Shares beneficially owned by it and offered hereby from time to time directly to one or more purchasers or to or through one or more underwriters, broker-dealers or agents or through a combination of any of these methods. If the Shares are sold through underwriters or broker-dealers, the Selling Stockholder will be responsible for underwriting discounts or commissions or agent's commissions in connection with the sale of the Shares. The Shares may be sold on any national securities exchange on which the Shares may be listed at the time of sale, in the over-the-counter market or in transactions other than on such exchange or in the over-the-counter market and in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at privately negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions.

The Selling Stockholder may use any one or more of the following methods when disposing of the Shares:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the Shares as agent, but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an over-the-counter distribution;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- short sales effected after the effective date of the registration statement of which this prospectus is a part;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- in "at the market" offerings, as defined in Rule 415 under the Securities Act, at negotiated prices, at prices prevailing at the time of sale or prices related to such prevailing market prices, including sales made directly on a national securities exchange or sales made through a market maker other than on an exchange or other similar offerings through sales agents;
- through trading plans entered into by the Selling Stockholder pursuant to Rule 10b5-1 under the Exchange Act, that are in place at the time of an offering pursuant to this prospectus that provides for periodic sales of their securities on the basis of parameters described in such trading plans;
- through firm-commitment underwritten public offerings;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The Selling Stockholder may, from time to time, pledge or grant a security interest in some or all of the Shares owned by it and, if it defaults in the performance of its secured obligations, the pledgees or secured parties may offer and sell the Shares from time to time under this prospectus or under an amendment or supplement to this prospectus to include the pledgee, transferee, or other successors in interest as the Selling Stockholder under this prospectus. The Selling Stockholder also may transfer the Shares in other circumstances, in which case the transferees, pledgees or other successors in interest will be the beneficial owners for purposes of this prospectus.

Table of Contents

In connection with the sale of Shares, the Selling Stockholder may enter into hedging transactions with broker-dealers or affiliates thereof or other financial institutions, which may in turn engage in short sales of our common stock in the course of hedging the positions it assumes. The Selling Stockholder may also sell shares of common stock short and deliver the Shares to close out its short positions, or loan or pledge the Shares to broker-dealers that in turn may sell these securities. The Selling Stockholder may also enter into option or other transactions with broker-dealers or affiliates thereof or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or affiliates thereof or other financial institution of Shares offered by this prospectus, which Shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

In addition, the Selling Stockholder may enter into derivative or hedging transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. In connection with such a transaction, the third parties may sell the applicable securities covered by and pursuant to this prospectus or any pricing supplement, as the case may be. If so, the third party may use securities borrowed from the Selling Stockholder or others to settle such sales and may use securities received from the Selling Stockholder to close out any related short positions. The Selling Stockholder may also loan or pledge securities covered by this prospectus to third parties, who may sell the loaned securities or, in an event of default in the case of a pledge, sell the pledged securities pursuant to this prospectus or any pricing supplement, as the case may be.

In addition, the Selling Stockholder may elect to make a pro rata in-kind distribution of securities to its members, partners or stockholders pursuant to the registration statement of which this prospectus is a part by delivering a prospectus with a plan of distribution. Such members, partners or stockholders would thereby receive freely tradeable securities pursuant to the distribution through a registration statement. To the extent a distributee is our affiliate (or to the extent otherwise required by law), we may, at our option, file a prospectus supplement in order to permit the distributees to use the prospectus to resell the securities acquired in the distribution.

Unless otherwise specified in connection with any particular offering of Shares, the obligations of the underwriters to purchase the Shares will be subject to certain conditions contained in an underwriting agreement that the Selling Stockholder will enter into with the underwriters at the time of the sale to them. The underwriters will be obligated to purchase all of the Shares offered if any of the Shares are purchased, unless otherwise specified in connection with any particular offering of Shares. Any initial offering price and any discounts or concessions allowed, reallocated or paid to dealers may be changed from time to time.

The Selling Stockholder may designate agents to sell the Shares. Unless otherwise specified in connection with any particular offering of Shares, the agents will agree to use their best efforts to solicit purchases for the period of their appointment. The Selling Stockholder may also sell the Shares to one or more remarketing firms, acting as principals for their own accounts or as agents for the Selling Stockholder. These firms will remarket the Shares upon purchasing them in accordance with a redemption or repayment pursuant to the terms of the Shares. A prospectus supplement or any pricing supplement, as the case may be, will identify any remarketing firm and will describe the terms of its agreement, if any, with the Selling Stockholder and its compensation.

In connection with offerings made through underwriters or agents, the Selling Stockholder may enter into agreements with such underwriters or agents pursuant to which the Selling Stockholder receives our outstanding securities in consideration for the Shares being offered to the public for cash. In connection with these arrangements, the underwriters or agents may also sell Shares covered by this prospectus to hedge their positions in these outstanding securities, including in short sale transactions. If so, the underwriters or agents may use the Shares received from the Selling Stockholder under these arrangements to close out any related open borrowings of securities.

Broker-dealers engaged by the Selling Stockholder may arrange for other broker-dealers to participate in sales. If the Selling Stockholder effects certain transactions by selling Shares to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts,

Table of Contents

concessions or commissions from the Selling Stockholder or commissions from purchasers of the Shares for whom they may act as agent or to whom they may sell as principal. Such commissions will be in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction will not be in excess of a customary brokerage commission in compliance with applicable rules of the Financial Industry Regulatory Authority, Inc. ("FINRA"); and in the case of a principal transaction, a markup or markdown in compliance with applicable FINRA rules.

The aggregate proceeds to the Selling Stockholder from the sale of the Shares offered by it will be the purchase price of the Shares less the Warrant exercise price and discounts or commissions, if any. The Selling Stockholder reserves the right to accept and, together with its agents from time to time, to reject, in whole or in part, any proposed purchase of Shares to be made directly or through agents. The Selling Stockholder also may resell all or a portion of the Shares in open market transactions in reliance upon Rule 144 under the Securities Act, rather than under this prospectus, provided that it meets the criteria and conforms to the requirements of that rule.

To the extent required pursuant to Rule 424(b) under the Securities Act, the Shares to be sold, the name of the Selling Stockholder, the purchase price and public offering price and the net proceeds to be received by the Selling Stockholder from the sale, the names of any agents, dealer or underwriter and the amount of Shares underwritten or purchased by each of them, if any, any applicable commissions or discounts with respect to a particular offer, any delayed delivery arrangements and any securities exchange or markets on which the Shares may be listed will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

The Selling Stockholder may authorize agents, dealers or underwriters to solicit certain institutional investors to purchase Shares on a delayed delivery basis pursuant to delayed delivery contracts providing for payment and delivery on a specified future date.

The Selling Stockholder will enter into such delayed contracts only with institutional purchasers that it approves. These institutions may include commercial and savings banks, insurance companies, pension funds, investment companies and educational and charitable institutions.

In order to comply with the securities laws of some states, if applicable, the Shares may be sold in these jurisdictions only through registered or licensed brokers or dealers. In addition, in some states the Shares may not be sold unless it has been registered or qualified for sale or an exemption from registration or qualification requirements is available and is complied with.

The Selling Stockholder may have agreements with agents, underwriters, dealers and remarketing firms to indemnify them against certain civil liabilities, including liabilities under the Securities Act. Agents, underwriters, dealers and remarketing firms, and their affiliates, may engage in transactions with, or perform services for, the Selling Stockholder in the ordinary course of business. This includes commercial banking and investment banking transactions.

The Selling Stockholder and any other person participating in a sale of the Shares registered under this prospectus will be subject to applicable provisions of the Exchange Act, and the rules and regulations thereunder, including, without limitation, to the extent applicable, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the Shares by the Selling Stockholder and any other participating person. All of the foregoing may affect the marketability of the Shares and the ability of any person or entity to engage in market-making activities with respect to the Shares. In addition, we will make copies of this prospectus (as it may be supplemented or amended from time to time) available to the Selling Stockholder for the purpose of satisfying the prospectus delivery requirements of the Securities Act. The Selling Stockholder may indemnify any broker-dealer that participates in transactions involving the sale of the Shares against certain liabilities, including liabilities arising under the Securities Act.

Table of Contents

In connection with any offering of Shares, the underwriters may purchase and sell shares of our common stock in the open market. These transactions may include short sales, syndicate covering transactions and stabilizing transactions. Short sales involve syndicate sales of common stock in excess of the number of shares to be purchased by the underwriters in the offering, which creates a syndicate short position. “Covered” short sales are sales of shares made in an amount up to the number of shares represented by the underwriters’ over-allotment option. In determining the source of shares to close out the covered syndicate 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 over-allotment option. Transactions to close out the covered syndicate short involve either purchases of the common stock in the open market after the distribution has been completed or the exercise of the over-allotment option. The underwriters may also make “naked” short sales of shares in excess of the over-allotment option. The underwriters must close out any naked short position by purchasing shares of common stock 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 the shares in the open market after pricing that could adversely affect investors who purchase in the offering. Stabilizing transactions consist of bids for or purchases of shares in the open market while the offering is in progress for the purpose of pegging, fixing or maintaining the price of the securities.

In connection with any offering, the underwriters may also engage in penalty bids. Penalty bids permit the underwriters to reclaim a selling concession from a syndicate member when the securities originally sold by the syndicate member are purchased in a syndicate covering transaction to cover syndicate short positions. Stabilizing transactions, syndicate covering transactions and penalty bids may cause the price of the securities to be higher than it would be in the absence of the transactions. The underwriters may, if they commence these transactions, discontinue them at any time.

LEGAL MATTERS

The validity of the Shares offered by this prospectus will be passed upon for us by Covington & Burling LLP, Washington, D.C.

EXPERTS

The financial statements and management’s assessment of the effectiveness of internal control over financial reporting (which is included in Management’s Report on Internal Control over Financial Reporting) incorporated in this prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2024 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and other reports, proxy and information statements and other information with the SEC. Our SEC filings are available to the public on the SEC’s website, www.sec.gov.

[Table of Contents](#)

The SEC allows us to “incorporate by reference” into this prospectus the information contained in documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is an important part of this prospectus, and information that we subsequently file with the SEC will automatically update and supersede this information. The following documents that we previously filed with the SEC (File No. 001-37553) are incorporated by reference herein:

- our [Annual Report on Form 10-K for the year ended December 31, 2024](#), filed with the SEC on March 13, 2025;
- our [Quarterly Report on Form 10-Q for the quarter ended March 31, 2025](#), filed with the SEC on May 12, 2025;
- our Current Reports on Form 8-K filed with the SEC on [January 14, 2025](#) (Item 1.01 only), [March 4, 2025](#) (Item 8.01 only), [May 19, 2025](#) (Items 1.01 and 2.03 only), and [June 3, 2025](#);
- the description of our common stock set forth in [Exhibit 4.2](#) to our Annual Report on Form 10-K for the year ended December 31, 2024, filed with the SEC on March 13, 2025, and all amendments and reports updating such description.

All reports and other documents that we subsequently file pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the completion of the sales of the securities offered hereby, but excluding any information furnished to, rather than filed with, the SEC (unless expressly incorporated by reference herein), will also be incorporated by reference into this prospectus and deemed to be part of this prospectus from the time of the filing of such reports and documents.

This prospectus may contain information that updates, modifies or is contrary to information herein or in one or more of the documents incorporated by reference in this prospectus. We have not authorized anyone else to provide you with different or additional information. You should not assume that the information in this prospectus is accurate as of any date other than the date of this prospectus or the date of the documents incorporated by reference in this prospectus.

We make available, free of charge, through our website at www.regenxbio.com our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and proxy and information statements, including any applicable amendments, filed or furnished pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. Information on, or that can be accessed through, our website is not incorporated into this prospectus or other securities filings and is not a part of these filings. You may also obtain, free of charge, a copy of any of these documents (other than exhibits to these documents unless the exhibits are specifically incorporated by reference into these documents or referred to in this prospectus) by writing or calling us at:

REGENXBIO Inc.
Attention: Chief Legal Officer
9804 Medical Center Drive
Rockville, MD 20850
(240) 552-8181



Up to 268,096 Shares of Common Stock

PROSPECTUS

June 25, 2025
