

PROSPECTUS SUPPLEMENT  
(To Prospectus dated April 1, 2024)

## 273,012 Shares of Common Stock Pre-Funded Warrants to Purchase up to 150,360 Shares of Common Stock



We are offering to certain accredited and institutional investors 273,012 shares of our common stock and pre-funded warrants to purchase 150,360 shares of our common stock, referred to herein as the Pre-Funded Warrants.

The combined offering price of each share of common stock, together with two accompanying Private Warrants (as defined below), is \$11.81 per share. The public offering price of the Pre-Funded Warrants, calculated on a per underlying share basis, together with two accompanying Private Warrants, is \$11.809 per share, and the exercise price per underlying share of the Pre-Funded Warrants is \$0.001 per share. Subject to limited exceptions, a holder of Pre-Funded Warrants will not have the right to exercise any portion of its Pre-Funded Warrants if the holder, together with its affiliates, would beneficially own in excess of 9.99% of the number of shares of common stock outstanding immediately after giving effect to such exercise. This prospectus supplement also relates to the offering of shares of our common stock issuable upon the exercise of such Pre-Funded Warrants. Subject to the limitations described above, the Pre-Funded Warrants may be exercised at any time until exercised in full.

In a concurrent private placement, we are also issuing to the same accredited and institutional investors private placement warrants, or the Private Warrants, to purchase up to an aggregate of 846,744 shares of our common stock. The Private Warrants are immediately exercisable until the 24-month anniversary of the date that the SEC declares the registration statement covering the resale of the shares of common stock issuable upon exercise of the Private Warrants effective, and the exercise price per underlying share of the Private Warrants is \$11.56. The Private Warrants and the shares of our common stock issuable upon the exercise of the Private Warrants, or the Private Warrant Shares, are not being registered under the Securities Act of 1933, as amended, or the Securities Act, pursuant to the registration statement of which this prospectus supplement and the accompanying prospectus form a part, nor are such Private Warrants or Private Warrant Shares being offered pursuant to such prospectus supplement and accompanying prospectus. The Private Warrants are being offered pursuant to the exemption provided in Section 4(a)(2) of the Securities Act and/or Rule 506(b) promulgated thereunder. The Private Warrants are being sold together with the shares of common stock and Pre-Funded Warrants being sold in this offering, and we will receive additional proceeds from the Private Warrants to the extent such Private Warrants are exercised for cash.

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

We engaged H.C. Wainwright & Co., LLC to act as our exclusive placement agent, or the Placement Agent, in connection with this offering. The Placement Agent is not purchasing the securities offered by us in this offering and is not required to arrange the purchase or sale of any specific number or dollar amount of securities, but will use its reasonable best efforts to arrange for the sale of the securities offered.

Our common stock is listed on the Nasdaq Capital Market under the symbol "LYRA." On June 25, 2025, the last reported sale price of the common stock on the Nasdaq Capital Market was \$12.30 per share.

**Investing in our securities involves risks. See "[Risk Factors](#)" beginning on page S-4.**

	Per Share and Two Private Warrants	Per Pre- Funded Warrant Underlying Share and Two Private Warrants	Total
Offering price	\$ 11.81	\$ 11.809	\$4,999,872.96
Placement agent fees(1)	\$ 0.8267	\$ 0.8267	\$ 350,001.63
Proceeds to us, before expenses	\$ 10.9833	\$ 10.9823	\$4,649,871.33

(1) Excludes certain out-of-pocket expenses of the Placement Agent which we have agreed to reimburse. See the section captioned "Plan of Distribution" in this prospectus supplement for additional information.

We are subject to the offering limits in General Instruction I.B.6 of Form S-3. As of the date of this prospectus supplement, the aggregate market value of our common stock held by non-affiliates pursuant to General Instruction I.B.6 of Form S-3 is \$29,239,212.80, which was calculated based on 1,060,160 shares of our outstanding common stock held by non-affiliates and a price of \$27.58 per share, the closing price of our common stock on June 3, 2025, which is the highest closing sale price of our common stock on the Nasdaq Capital Market within the prior 60 days. Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell securities in public primary offerings on Form S-3 with a value (calculated in accordance with General Instruction I.B.6) exceeding one-third of our public float (as defined by General Instruction I.B.6) in any 12 calendar month period so long as our public float remains below \$75.0 million. As of the date of this prospectus supplement, we have not sold any shares of our common stock pursuant to General Instruction I.B.6 of Form S-3 during the 12 calendar months prior to, and including, the date of this prospectus supplement.

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

**Delivery of the securities is expected to be made on or about June 27, 2025.**

**H.C. Wainwright & Co.**

The date of this prospectus supplement is June 26, 2025.

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## ABOUT THIS PROSPECTUS SUPPLEMENT

This document is in two parts. The first part is the prospectus supplement, including the documents incorporated by reference, which describes the specific terms of this offering. The second part, the accompanying prospectus, including the documents incorporated by reference, provides more general information. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. Before you invest, you should carefully read this prospectus supplement, the accompanying prospectus, all information incorporated by reference herein and therein, as well as the additional information described under “Where You Can Find More Information; Incorporation by Reference” on page S-19 of this prospectus supplement. These documents contain information you should consider when making your investment decision. This prospectus supplement may add, update or change information contained in the accompanying prospectus or any documents incorporated by reference. To the extent that any statement that we make in this prospectus supplement is inconsistent with statements made in the accompanying prospectus or any documents incorporated by reference, the statements made in this prospectus supplement will be deemed to modify or supersede those made in the accompanying prospectus and such documents incorporated by reference.

You should rely only on the information contained or incorporated by reference in this prospectus supplement, the accompanying prospectus and in any free writing prospectuses we may provide to you in connection with this offering. Neither we nor the Placement Agent have authorized any other person to provide you with any information that is different. If anyone provides you with different or inconsistent information, you should not rely on it. We are offering to sell, and seeking offers to buy, the securities offered hereby only in jurisdictions where offers and sales are permitted. The distribution of this prospectus supplement and the offering of the securities offered hereby in certain jurisdictions may be restricted by law. Persons outside the United States who come into possession of this prospectus supplement must inform themselves about, and observe any restrictions relating to, the offering of the securities offered hereby and the distribution of this prospectus supplement outside the United States. This prospectus supplement does 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 by any person in any jurisdiction in which it is unlawful for such person to make such an offer or solicitation.

Unless otherwise indicated, information contained in this prospectus supplement, the accompanying prospectus or the documents incorporated by reference concerning our industry and the markets in which we operate, including our general expectations and market position, market opportunity and market share, is based on information from our own management estimates and research, as well as from industry and general publications and research, surveys and studies conducted by third parties. Management estimates are derived from publicly available information, our knowledge of our industry and assumptions based on such information and knowledge, which we believe to be reasonable. In addition, assumptions and estimates of our and our industry’s future performance are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, including those described in “Risk Factors” in this prospectus supplement, the accompanying prospectus and in our Annual Report on Form 10-K for the year ended December 31, 2024 and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2025, which are incorporated by reference into this prospectus supplement. These and other important factors could cause our future performance to differ materially from our assumptions and estimates. See “Special Note Regarding Forward-Looking Statements.”

When we refer to “Lyra,” “we,” “our,” “us” and the “Company” in this prospectus supplement, we mean Lyra Therapeutics, Inc. and its consolidated subsidiaries, unless otherwise specified.

This prospectus supplement also includes trademarks, tradenames and service marks that are the property of other organizations. Solely for convenience, trademarks and tradenames referred to in this prospectus supplement appear without the ® and ™ symbols, but those references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or that the applicable owner will not assert its rights, to these trademarks and tradenames.

## PROSPECTUS SUPPLEMENT SUMMARY

*This summary highlights selected information about us, this offering and information appearing elsewhere in this prospectus supplement, in the accompanying prospectus and in the documents we incorporate by reference. This summary is not complete and does not contain all of the information you should consider before investing in our securities. Before making an investment decision, to fully understand this offering and its consequences to you, you should carefully read this entire prospectus supplement and the accompanying prospectus, including “Risk Factors” beginning on page S-4 of this prospectus supplement and the financial statements and related notes and the other information that we incorporate by reference into this prospectus supplement.*

### **Our Company**

We are a clinical-stage biotechnology company focused on the development and commercialization of innovative, anti-inflammatory therapies for the localized treatment of patients with chronic rhinosinusitis, or CRS. CRS is an inflammatory disease of the paranasal sinuses which leads to debilitating symptoms and significant morbidities and affects approximately 14 million people in the United States. Our primary product candidate, LYR-210, is a bioabsorbable nasal insert designed to be administered in a simple, in-office procedure and intended to deliver six months of continuous anti-inflammatory drug therapy to the sinonasal passages for the treatment of CRS with a single administration. The drug embedded within LYR-210 is mometasone furoate, or MF, which is the active ingredient in various U.S. Food and Drug Administration, or FDA, approved drugs and has a well-established efficacy and safety profile.

In June 2025, we announced positive results from the ENLIGHTEN 2 Phase 3 clinical trial of LYR-210 in adult patients with CRS. The ENLIGHTEN 2 trial met its primary endpoint, with LYR-210 demonstrating statistically significant improvement compared to sham control in a composite of the three cardinal symptoms, or 3CS, of CRS (nasal obstruction, nasal discharge and facial pain/pressure) at week 24 (-1.13;  $p=0.0078$ ) in patients without nasal polyps. The ENLIGHTEN 2 trial also met the key secondary endpoints of 3CS at 24 weeks in the full population (i.e., patients with and without nasal polyps) (-0.90;  $p=0.0209$ ) and in the clinically-validated SNOT-22 score at 24 weeks (-8.7;  $p=0.0101$ ), with symptom improvement observed as early as week 4. Consistent with previous studies, LYR-210 was well-tolerated, with a safety profile similar to sham control. Additionally, in pooled data from the ENLIGHTEN 2 and ENLIGHTEN 1 trials in 64 CRS patients with nasal polyps, LYR-210 demonstrated a consistent positive trend over 24 weeks in multiple key efficacy endpoints.

The ENLIGHTEN program consists of two Phase 3 clinical trials, ENLIGHTEN 1 and ENLIGHTEN 2, to evaluate the efficacy and safety of LYR-210 for the treatment of CRS. While the ENLIGHTEN 2 trial met its primary endpoint and key secondary endpoints, the ENLIGHTEN 1 trial did not meet the primary endpoint or secondary endpoints. Each ENLIGHTEN trial has enrolled approximately 180 CRS patients who have failed medical management and have not had prior ethmoid sinus surgery, randomized 2:1 to either LYR-210 (7500 $\mu$ g MF) or sham control. The 24-week endpoints in the ENLIGHTEN trials assess LYR-210's long-acting therapeutic effect as a bioresorbable nasal implant designed to deliver six months of continuous anti-inflammatory medication to the sinonasal passages.

### **Corporate Information**

We were incorporated under the laws of the state of Delaware in November 2005 under the name WMR Biomedical, Inc. In July 2018, we changed our name to Lyra Therapeutics, Inc. Our principal executive offices are located at 480 Arsenal Way, Watertown, MA 02472 and our telephone number is (617) 393-4600.

## THE OFFERING

Common stock offered by us	273,012 shares of common stock.
Pre-Funded Warrants offered by us	We are also offering Pre-Funded Warrants to purchase 150,360 shares of our common stock. The exercise price per underlying share of the Pre-Funded Warrants is \$0.001 per share. The Pre-Funded Warrants will be exercisable at any time after the date of issuance thereof, subject to certain limitations. See “Description of the Securities We Are Offering” on page S-13. This prospectus supplement also relates to the offering of the shares of our common stock issuable upon exercise of the Pre-Funded Warrants.
Common stock to be outstanding immediately after this offering	1,740,983 shares, assuming the exercise in full of the Pre-Funded Warrants offered herein, and no exercise of the Private Warrants being issued in a concurrent private placement transaction.
Offering price	\$11.81 per share of common stock and two accompanying Private Warrants and \$11.809 per underlying share of the Pre-Funded Warrant and two accompanying Private Warrants.
Use of proceeds	<p>We estimate the net proceeds from this offering will be approximately \$4.4 million, after deducting placement agent fees and estimated offering expenses payable by us.</p> <p>We intend to use the net proceeds of this offering for working capital and other general corporate purposes, including potential clinical development, manufacturing and other pre-commercialization expenses for LYR-210. Please see “Use of Proceeds” on page S-9.</p>
Risk factors	See “Risk Factors” beginning on page S-4 of this prospectus supplement and in the documents incorporated by reference into this prospectus supplement for a discussion of factors that you should read and consider before investing in our securities.
Nasdaq Capital Market Symbol; Listing	“LYRA.” There is no established public trading market for the Pre-Funded Warrants and we do not expect a market to develop. In addition, we do not intend to apply for listing of the Pre-Funded Warrants on the Nasdaq Capital Market or on any national securities or other national recognized trading system. Without an active trading market, the liquidity of the Pre-Funded Warrants will be limited.
Concurrent private placement of Private Warrant	In a concurrent private placement, we are issuing to the purchasers of our common stock and Pre-Funded Warrants in this offering Private Warrants to purchase 846,744 shares of our common stock. The exercise price per underlying share of the Private Warrants is \$11.56. The Private Warrants are being sold together with the shares of

common stock and Pre-Funded Warrants being sold in this offering, and we will receive additional proceeds from the Private Warrants to the extent such Private Warrants are exercised for cash. The Private Warrants and the shares of our common stock issuable upon the exercise of the Private Warrants are not being offered pursuant to this prospectus supplement and the accompanying prospectus. See “Private Placement Transaction” on page S-15.

The number of shares of our common stock to be outstanding immediately after this offering is based on 1,317,611 shares of our common stock outstanding as of March 31, 2025 and the assumed exercise of all of the Pre-Funded Warrants offered herein, and excludes:

- 90,250 shares of common stock issuable upon exercise of stock options outstanding under our 2005 Equity Incentive Plan, 2016 Equity Incentive Plan, 2020 Equity Incentive Plan and 2022 Employment Inducement Award Plan, collectively referred to as our Plans, at a weighted-average exercise price of \$212.29 per share, as of March 31, 2025;
- 94,749 shares of common stock issuable upon the vesting of restricted stock units at a weighted-average grant date fair value of \$44.87, as of March 31, 2025;
- 60,447 shares of common stock available for future issuance under our Plans, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under our Plans, as of March 31, 2025;
- 19,730 shares of common stock available for future issuance under our 2020 Employee Stock Purchase Plan, or 2020 ESPP, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under our 2020 ESPP, as of March 31, 2025; and
- 172,126 shares of common stock issuable upon exercise of warrants to purchase common stock at an exercise price of \$133.65 per share, as of March 31, 2025.

Unless otherwise indicated, this prospectus supplement reflects and assumes:

- one-for-50 reverse split of our common stock effected on May 27, 2025;
- no exercise of the Private Warrants; and
- no exercise of outstanding options and warrants to purchase common stock, and no issuance of shares available for future issuance under our equity compensation plans.

## RISK FACTORS

*Investing in our securities involves a high degree of risk. Before investing in our securities, you should consider carefully the risks described below, together with the other information contained in this prospectus supplement, the accompanying prospectus or incorporated by reference herein or therein, including the risks and uncertainties discussed under “Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2024 and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2025, which are incorporated by reference into this prospectus supplement. If any of the risks incorporated by reference or set forth below occur, our business, financial condition, results of operations and future growth prospects could be materially and adversely affected. In these circumstances, the market price of our securities could decline, and you may lose all or part of your investment.*

### **Risks Related to this Offering and our Securities**

***You will experience immediate and substantial dilution as a result of this offering and may experience additional dilution in the future.***

Because the price per share of our common stock being offered is higher than the book value per share of our common stock, you will suffer substantial dilution in the net tangible book value of the common stock you purchase in this offering. After giving effect to the sale by us of 273,012 shares of common stock at the public offering price of \$11.81 per share and Pre-Funded Warrants to purchase 150,360 shares of our common stock for \$11.81 per share (which equals the \$11.809 per underlying share purchase price, plus the \$0.001 per underlying share exercise price) (including the shares of common stock issuable upon exercise of the Pre-Funded Warrants and resulting proceeds, but excluding any resulting accounting associated with the Pre-Funded Warrants and without giving effect to any exercise of the Private Warrants described elsewhere in this prospectus supplement), less the Placement Agent fees and estimated offering expenses payable by us in each case, if you purchase securities in this offering, you will suffer immediate and substantial dilution of \$7.06 per share, representing the difference between the public offering price per share of \$11.81 and the adjusted net tangible book value per share of our common stock of \$4.75 as of March 31, 2025. See “Dilution” below for a more detailed discussion of the dilution you will incur if you purchase our common stock and Pre-Funded Warrants in the offering.

In addition, we are selling private placement warrants to purchase 846,744 shares of common stock, or the Private Warrant, in a concurrent private placement to the same investors as are purchasing the shares of common stock and the Pre-Funded Warrants, and we may in the future offer additional shares of our common stock or other securities convertible into or exchangeable for our common stock at prices that may not be the same as the price per share in this offering. In the event that the Private Warrants or the other outstanding options or warrants are exercised or settled, or that we make additional issuances of common stock or other convertible or exchangeable securities, you could experience additional dilution. We cannot assure you that we will be able to sell shares or other securities in any other offering at a price per share that is equal to or greater than the price per share paid in this offering, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders, including investors who purchase shares of common stock and Pre-Funded Warrants in this offering. The price per share at which we sell additional shares of our common stock or securities convertible into common stock in future transactions, may be higher or lower than the price per share in this offering. As a result, purchasers of the shares and Pre-Funded Warrants we sell, as well as our existing stockholders, will experience significant dilution if we sell at prices significantly below the price at which they invested. See “Dilution” below for a more detailed illustration of the dilution you would incur if you participate in this offering.

***There is no public market for the Pre-Funded Warrant being sold in this offering or the Private Warrant being sold in a private placement concurrently with this offering.***

There is no established public trading market for the Pre-Funded Warrants being offered in this offering or the Private Warrants being offered in the concurrent private placement, and we do not expect a market to develop.

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In addition, we do not intend to apply for listing of the Pre-Funded Warrants or Private Warrants on any national securities exchange or other nationally recognized trading system. Without an active market, the liquidity of the Pre-Funded Warrants and Private Warrants will be limited.

***We will not receive any meaningful amount of additional funds upon the exercise of the Pre-Funded Warrants.***

Each Pre-Funded Warrant will be exercisable until it is fully exercised and by means of payment of the nominal cash purchase price upon exercise or by means of a “cashless exercise” according to a formula set forth in the Pre-Funded Warrant. Accordingly, we will not receive any meaningful additional funds upon the exercise of the Pre-Funded Warrants.

***We have broad discretion to determine how to use the funds raised in this offering and the concurrent private placement, and may use them in ways that may not enhance our operating results or the price of our common stock.***

Our management will have broad discretion over the use of proceeds from this offering and the concurrent private placement, and we could spend the proceeds from this offering and the concurrent private placement in ways our stockholders may not agree with or that do not yield a favorable return, if at all. We intend to use the net proceeds for working capital and other general corporate purposes, including potential clinical development, manufacturing and other pre-commercialization expenses for LYR-210. However, our use of these proceeds may differ substantially from our current plans. If we do not invest or apply the proceeds of this offering and the concurrent private placement in ways that improve our operating results, we may fail to achieve expected financial results, which could cause our stock price to decline and could have an adverse effect on the market price of our common stock.

***Any holder of the Pre-Funded Warrants and Private Warrants will have no rights as a holder of our common stock until such holder exercises its Pre-Funded Warrants and/or Private Warrants and acquires our common stock.***

Until the holder of any Pre-Funded Warrants or Private Warrants exercises such Pre-Funded Warrants and/or Private Warrants and acquires shares of our common stock, such holder will have no rights with respect to the shares of our common stock underlying such Pre-Funded Warrants or Private Warrants. Upon exercise of such Pre-Funded Warrants or Private Warrants, the holder will be entitled to exercise the rights of a holder of our common stock only as to matters for which the record date occurs after the exercise date.

***A significant holder or beneficial holder of our common stock may not be permitted to exercise the Pre-Funded Warrants or Private Warrants that it holds.***

A holder of the Pre-Funded Warrants and/or Private Warrants will not be entitled to exercise any portion of the Pre-Funded Warrants or Private Warrants 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 Securities Exchange Act of 1934, as amended, or the Exchange Act) to exceed 9.99% (in the case of the Pre-Funded Warrants) or 4.99% (in the case of the Private Warrants) 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 Warrants or Private Warrants and subject to such holder’s rights under the Pre-Funded Warrants and Private Warrants 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. As a result, a holder may not be able to exercise its Pre-Funded Warrants or Private Warrants for shares of our common stock at a time when it would be financially beneficial for such holder to do so. In such a circumstance, a holder could seek to sell its Pre-Funded Warrants or Private Warrants to realize value, but it may be unable to do so in the absence of an established trading market.

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### ***This offering may cause the trading price of our common stock to decrease.***

The price per share, together with the number of shares of common stock and Pre-Funded Warrants we propose to issue and ultimately will issue if this offering is completed and/or the number of shares of our common stock issuable upon exercise of the Private Warrants being sold concurrently herewith, may result in an immediate decrease in the market price of our common stock. This decrease may continue after the completion of this offering.

### ***If we do not file and maintain a current and effective prospectus relating to the common stock issuable upon exercise of the Private Warrants, the holder thereof may exercise the Private Warrants on a “cashless basis.”***

If we do not file and maintain a current and effective prospectus relating to the shares of common stock issuable upon exercise of the Private Warrants at the time that holders wish to exercise such warrants, they will be able to exercise such warrants on a “cashless basis”. As a result, the number of shares of common stock that holders will receive upon exercise of the Private Warrants will be fewer than it would have been had such holders exercised their Private Warrants for cash. We have agreed to file a registration statement to register the shares of common stock underlying the Private Warrants, or the Private Warrant Shares, as soon as practicable (and in any event within 30 calendar days of the date of this prospectus supplement), and use commercially reasonable efforts to cause such registration statement to become effective within 60 days following the closing date of this offering (or 90 days following the closing date in the event of a full review by the SEC) and to keep such registration statement effective at all times until the investor holds no Private Warrants or Private Warrant Shares issuable upon exercise thereof. However, we cannot assure you that we will be able to do so. If the Private Warrants are exercised on a “cashless” basis, we will not receive any consideration from such exercises.

### ***Provisions of the Private Warrant could discourage an acquisition of us by a third party.***

Certain provisions of the Private Warrants being sold in a private offering concurrently with this offering could make it more difficult or expensive for a third party to acquire us. The Private Warrants prohibit us from engaging in certain transactions constituting “fundamental transactions” unless, among other things, the surviving entity assumes our obligations under the Private Warrants. Further, the Private Warrants provide that, in the event of “fundamental transaction,” with some exceptions, we or a successor entity will be obligated to, at the option of the holder of such warrant, purchase such warrant from such holder by paying an amount of cash equal to the Black Scholes value (as described in such warrants) of the unexercised portion of the Private Warrant on the date of the consummation of the fundamental transaction. For more information, see “Private Placement Transaction”. These and other provisions of the Private Warrants could prevent or deter a third party from acquiring us even where the acquisition could be beneficial to the holders of our common stock.

### ***There may be future sales of our common stock, which could adversely affect the market price of our common stock and dilute a stockholder’s ownership of common stock.***

The exercise of any warrants or options granted to executive officers and other service providers under our equity compensation plans, and any other issuances of our common stock could have an adverse effect on the market price of the shares of our common stock. Other than the restrictions set forth in the section titled “Plan of Distribution,” we are not restricted from issuing additional shares of common stock, including any securities that are convertible into or exchangeable for, or that represent the right to receive shares of common stock, provided that we are subject to the requirements of the Nasdaq Capital Market (which generally requires stockholder approval for any transactions which would result in the issuance of more than 20% of our then outstanding shares of common stock or voting rights representing over 20% of our then outstanding shares of stock). Sales of a substantial number of shares of our common stock in the public market or the perception that such sales might occur could materially adversely affect the market price of the shares of our common stock. Because our decision to issue securities in any future offering will depend on market conditions and other factors beyond our control, we cannot predict or estimate the amount, timing or nature of our future offerings. Accordingly, our stockholders bear the risk that our future offerings will reduce the market price of our common stock and dilute their stock holdings in us.

## SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

The information in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein and any free writing prospectus that we have authorized for use in connection with this offering contain forward-looking statements and information within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, which are subject to the “safe harbor” created by those sections. These forward-looking statements include, but are not limited to, statements concerning:

- our restructuring initiatives and our ability to continue as a going concern;
- our evaluation of strategic transactions, if any, to maximize shareholder value;
- our estimates and statements regarding our future revenue, future results of operations, and financial position;
- the sufficiency of our cash and cash equivalents to fund our operations;
- plans to develop, manufacture, and commercialize LYR-210;
- the timing of our ongoing or planned clinical trials for LYR-210, and any future product candidates, as well as the timing for any results;
- the timing of and our ability to obtain and maintain regulatory approvals for LYR-210, and any future product candidates;
- the clinical utility of LYR-210;
- our commercialization, marketing, and manufacturing capabilities and strategy;
- our expectations about the willingness of healthcare professionals to use LYR-210, and any future product candidates;
- our expectations regarding the development and commercialization of LYR-210 pursuant to the terms of our license agreement with LianBio;
- our intellectual property position;
- our competitive position and developments and projections relating to our competitors or our industry;
- the impact of laws and regulations;
- risks associated with the COVID-19 pandemic and related macroeconomic factors, which may adversely impact our business and clinical trials;
- our expectations regarding the time during which we will be an emerging growth company under the Jumpstart Our Business Startups Act, or the JOBS Act;
- our business strategy;
- our projected research and development costs;
- the plans and objectives of management for future operations; and
- our intended use of proceeds from this offering and our related cash runway.

The words “anticipates”, “believes”, “estimates”, “expects”, “intends”, “targets”, “may”, “plans”, “projects”, “potential”, “will”, “would”, “could” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. All such forward-looking statements involve significant risks and uncertainties, including, but not limited to, those described under the heading “Risk Factors” and elsewhere in this prospectus supplement, accompanying prospectus and the documents incorporated by reference herein and therein.

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As more fully described under the heading “Risk Factors” and elsewhere in this prospectus supplement and under “Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2024 and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2025, which are incorporated by reference into this prospectus supplement, many important factors affect our ability to achieve our stated objectives. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. These forward-looking statements involve risks and uncertainties that could cause our actual results to differ materially from those in the forward-looking statements, including, without limitation, the risks and uncertainties set forth in our filings with the SEC. You should read this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein and any free writing prospectuses that we have authorized for use in this offering with the understanding that our actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements that we make. The forward-looking statements are applicable only as of the date on which they are made, and we do not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

## USE OF PROCEEDS

We estimate that the net proceeds to us from this offering, after deducting Placement Agent fees and paying estimated offering expenses payable by us, will be approximately \$4.4 million, assuming the exercise in full of the Pre-Funded Warrants and not including any funds we may receive as a result of the exercise of the Private Warrants.

We intend to use the net proceeds of this offering for working capital and other general corporate purposes, including potential clinical development, manufacturing and other pre-commercialization expenses for LYR-210. We believe that our cash, cash equivalents and marketable securities, together with the net proceeds from this offering, will fund our operations into the third quarter of 2026. We have based this estimate on assumptions that may prove to be incorrect, and we could utilize our available capital resources sooner than we currently expect.

The amounts and timing of our actual expenditures will depend on numerous factors, including the progress of our clinical trials and other development efforts and other factors described under “Risk Factors” in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein, as well as the amount of cash used in our operations. We may find it necessary or advisable to use the net proceeds for other purposes, and we will have broad discretion in the application of the net proceeds. Pending the uses described above, we plan to invest the net proceeds from this offering in short- and intermediate-term, interest-bearing obligations, investment-grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government. In addition, while we have not entered into any agreements, commitments or understandings relating to any significant transaction as of the date of this prospectus supplement, we may use a portion of the net proceeds to pursue acquisitions, joint ventures and other strategic transactions.

**DIVIDEND POLICY**

We intend to retain future earnings, if any, to finance the operation and expansion of our business and do not anticipate paying any cash dividends in the foreseeable future. Any future determination related to our dividend policy will be made at the discretion of our board of directors after considering our financial condition, results of operations, capital requirements, business prospects and other factors the board of directors deems relevant, and subject to the restrictions contained in any future financing instruments.

## DILUTION

If you invest in this offering, your ownership interest will be immediately diluted to the extent of the difference between the public offering price per share of common stock and/or per underlying share of the Pre-Funded Warrants and the as adjusted net tangible book value per share after giving effect to this offering.

As of March 31, 2025, we had a net tangible book value of \$3.9 million, or \$2.94 per share of common stock. Our net tangible book value per share represents total tangible assets less total liabilities, divided by the number of shares of common stock outstanding at March 31, 2025, after giving effect to the assumptions set forth below.

After giving effect to the issuance and sale by us of 273,012 shares of common stock at a public offering price of \$11.81 per share in this offering, and Pre-Funded Warrants to purchase 150,360 shares of our common stock for \$11.81 per share (which equals the \$11.809 per underlying share purchase price, plus the \$0.001 per underlying share exercise price) (including the shares of common stock issuable upon exercise of the Pre-Funded Warrants and resulting proceeds, but excluding any resulting accounting associated with the Pre-Funded Warrants and without giving effect to any exercise of the Private Warrants described elsewhere in this prospectus supplement), less the Placement Agent fees and estimated offering expenses payable by us, our as adjusted net tangible book value as of March 31, 2025 would have been approximately \$8.3 million, or approximately \$4.75 per share. This amount represents an immediate increase in net tangible book value of \$1.81 per share to our existing stockholders and an immediate dilution in net tangible book value of approximately \$7.06 per share to new investors purchasing shares of common stock in this offering.

All calculations of dilution in this prospectus supplement assume the sale of all of the shares and Pre-Funded Warrants offered in this offering. The following table illustrates this dilution on a per share basis:

Public offering price per share of common stock (or Pre-Funded Warrant share, plus the exercise price of the Pre-Funded Warrant)	\$11.81
Net tangible book value per share as of March 31, 2025	\$2.94
Increase in net tangible book value per share attributable to new investors purchasing shares and Pre-Funded Warrants in this offering	<u>1.81</u>
As adjusted net tangible book value per share after this offering (including the shares of common stock issuable upon exercise of the Pre-Funded Warrants and resulting proceeds, but excluding any resulting accounting associated with the Pre-Funded Warrants and without giving effect to any exercise of the Private Warrants described elsewhere in this prospectus supplement)	<u>4.75</u>
Dilution per share to new investors participating in this offering	<u>\$ 7.06</u>

The above discussion and table exclude:

- 90,250 shares of common stock issuable upon exercise of stock options outstanding under our 2005 Equity Incentive Plan, 2016 Equity Incentive Plan, 2020 Equity Incentive Plan and 2022 Employment Inducement Award Plan, collectively referred to as our Plans, at a weighted-average exercise price of \$212.29 per share;

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- 94,749 shares of common stock issuable upon the vesting of restricted stock units at a weighted-average grant date fair value of \$44.87;
- 160,447 shares of common stock available for future issuance under our Plans, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under our Plans;
- 19,730 shares of common stock available for future issuance under our ESPP, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under our 2020 ESPP; and
- 172,126 shares of common stock issuable upon exercise of warrants to purchase common stock at an exercise price of \$133.65 per share.

To the extent any of these outstanding options or warrants are exercised at a price less than the public offering price, there may be further dilution to purchasers of our common stock in this offering.

The information above reflects and assumes:

- one-for-50 reverse split of our common stock effected on May 27, 2025;
- no exercise of the Private Warrants; and
- no exercise of outstanding options and warrants to purchase common stock, and no issuance of shares available for future issuance under our equity compensation plans.

## DESCRIPTION OF THE SECURITIES WE ARE OFFERING

We are offering through this prospectus supplement and the accompanying prospectus (i) 273,012 shares of our common stock, and (ii) Pre-Funded Warrants to purchase up to 150,360 shares of our common stock. We are also registering the shares of our common stock issuable from time to time upon exercise of the Pre-Funded Warrants offered hereby.

### **Common Stock**

The material terms and provisions of our common stock and each other class of our securities that qualifies or limits our common stock are described under the caption “Description of Capital Stock” starting on page 7 of the accompanying prospectus.

### **Pre-Funded Warrants**

The following summary of certain terms and provisions of Pre-Funded Warrants that are being offered hereby is not complete and is subject to, and qualified in its entirety by, the provisions of the Pre-Funded Warrants, the form of which will be filed with the SEC as an exhibit to a Report on Form 8-K in connection with this offering and incorporated by reference into the registration statement of which this prospectus supplement and the accompanying prospectus form a part. Prospective investors should carefully review the terms and provisions of the form of Pre-Funded Warrants for a complete description of the terms and conditions of the Pre-Funded Warrants.

### ***Duration and Exercise Price***

The Pre-Funded Warrant offered hereby will have an initial exercise price of \$0.001 per share. The Pre-Funded Warrants will be immediately exercisable and may be exercised at any time until the Pre-Funded Warrants are exercised in full. The exercise price and number of shares of common stock issuable upon exercise is subject to appropriate adjustment in the event of stock dividends, stock splits, reorganizations or similar events affecting our common stock and the exercise price.

### ***Exercisability***

The Pre-Funded Warrant will be exercisable, at the option of each holder, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of shares of common stock purchased upon such exercise (except in the case of a cashless exercise as discussed below).

A holder (together with its affiliates) may not exercise any portion of the Pre-Funded Warrants to the extent that the holder would beneficially own more than 9.99% of the outstanding common stock immediately after exercise (the “Beneficial Ownership Limitation”), except that upon at least 61 days’ prior notice from the holder to us, the holder may increase the Beneficial Ownership Limitation, provided that the Beneficial Ownership Limitation in no event exceeds 9.99%.

### ***Cashless Exercise***

In lieu of making the cash payment otherwise contemplated to be made to us upon such exercise in payment of the aggregate exercise price, the holder may, in its sole discretion, instead elect, and if at the time of exercise thereof there is no effective registration statement registering, or the prospectus contained therein is not available for, the issuance of the shares underlying the Pre-Funded Warrants to the holder thereof, must instead elect, to receive upon such exercise (either in whole or in part) the net number of shares of common stock determined according to a formula set forth in the Pre-Funded Warrants. No fractional shares of common stock will be issued in connection with the exercise of the Pre-Funded Warrants. In lieu of fractional shares, we will pay the holder an amount in cash equal to the fractional amount multiplied by the exercise price or round up to the next whole share.

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***Fundamental Transaction***

In the event of a fundamental transaction, as described in the Pre-Funded Warrants and generally including any reorganization, recapitalization or reclassification of our common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the acquisition of more than 50% of our outstanding voting securities, the holders of the Pre-Funded Warrants will be entitled to receive upon exercise of the Pre-Funded Warrants the kind and amount of securities, cash or other property that the holders would have received had they exercised the Pre-Funded Warrants immediately prior to such fundamental transaction.

***Transferability***

Subject to applicable laws, each Pre-Funded Warrant may be transferred at the option of the holder upon surrender of such Pre-Funded Warrant to us together with the appropriate instruments of transfer.

***Exchange Listing***

We do not intend to list the Pre-Funded Warrants on any securities exchange or nationally recognized trading system.

***Rights as a Stockholder***

Except as otherwise provided in the Pre-Funded Warrants or by virtue of such holder's ownership of 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 the Pre-Funded Warrants.

## PRIVATE PLACEMENT TRANSACTION

Concurrently with the sale of common stock and Pre-Funded Warrants in this offering, we will issue to the investor in this offering private placement warrants, or Private Warrants, to purchase up to an aggregate of 846,744 shares of common stock at an exercise price equal to \$11.56 per share (subject to standard adjustments for stock splits, stock dividend, rights offerings and pro rata distributions). The Private Warrants are being sold together with the shares of common stock and Pre-Funded Warrants being sold in this offering, and we will receive additional proceeds from the Private Warrants to the extent such Private Warrants are exercised for cash.

The Private Warrants and the common stock issuable upon the exercise of such Private Warrants are not being registered under the Securities Act, are not being offered pursuant to this prospectus supplement and the accompanying prospectus and instead are being offered pursuant to the exemption provided in Section 4(a)(2) under the Securities Act and/or Rule 506(b) promulgated thereunder. Accordingly, the purchasers may only sell common stock issued upon exercise of the Private Warrants pursuant to an effective registration statement under the Securities Act covering the resale of those shares, an exemption under Rule 144 under the Securities Act or another applicable exemption under the Securities Act.

The summary below is not complete and is subject to, and qualified in its entirety by, the provisions of the Private Warrants, which will be filed with the SEC as an exhibit to a Current Report on Form 8-K in connection with the concurrent private placement and incorporated by reference into the registration statement of which this prospectus supplement and the accompanying prospectus form a part. Prospective investors should carefully review the terms and provisions of the form of Private Warrants for a complete description of the terms and conditions of the Private Warrants.

### ***Duration, Exercise Price and Anti-Dilutive Rights***

The Private Warrants have an exercise price of \$11.56 per share and will be immediately exercisable. The Private Warrants will expire on the 24-month anniversary of the date that the SEC declares the Re-Sale Registration Statement effective. The Private Warrants contain standard adjustments to the exercise price including for stock splits, stock dividend, rights offerings and pro rata distributions.

### ***Exercisability***

The Private Warrants will be immediately exercisable, at the option of each holder and until the expiration date, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of purchased upon such exercise (except in the case of a cashless exercise as discussed below).

### ***Exercise Limitation***

A holder (together with its affiliates) may not exercise any portion of the Private Warrants to the extent that the holder would beneficially own more than 4.99% of the outstanding common stock immediately after exercise (the "Beneficial Ownership Limitation"), except that upon at least 61 days' prior notice from the holder to us, the holder may increase the Beneficial Ownership Limitation, provided that the Beneficial Ownership Limitation in no event exceeds 9.99%.

### ***Cashless Exercise***

In lieu of making the cash payment otherwise contemplated to be made to us upon such exercise in payment of the aggregate exercise price, the holder may, in the event the shares underlying the Private Warrants, or the Private Warrant Shares, are not registered under the Securities Act, elect instead to receive upon such exercise (either in whole or in part) the net number of shares of common stock determined according to a formula set forth in the Private Warrants. No fractional shares of common stock will be issued in connection with the exercise of a Private Warrant. In lieu of fractional shares, we will pay the holder an amount in cash equal to the fractional amount multiplied by the exercise price or round up to the next whole share.

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### ***Fundamental Transaction***

In the event of a fundamental transaction, as described in the Private Warrants and generally including any reorganization, recapitalization or reclassification of our common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the acquisition of more than 50% of our outstanding voting securities, the holders of the Private Warrant will be entitled to receive upon exercise of the Private Warrant the kind and amount of securities, cash or other property that the holders would have received had they exercised the Private Warrant immediately prior to such fundamental transaction. In addition, in the event of a fundamental transaction, with some exceptions, we or a successor entity will be obligated to, at the option of the holder of such warrant, purchase such warrant from such holder by paying an amount of cash equal to the Black Scholes value (as described in such warrants) of the unexercised portion of the Private Warrant on the date of the consummation of the fundamental transaction.

### ***Transferability***

Subject to applicable laws, a Private Warrant may be transferred at the option of the holder upon surrender of the Private Warrant to us together with the appropriate instruments of transfer.

### ***Resale/Registration Rights***

Under the purchase agreement pursuant to which the Private Warrant was sold, or the Purchase Agreement, we agreed that as soon as practicable (and in any event within 30 calendar days of the date of the Purchase Agreement), we would file a registration statement on Form S-1, referred to herein as the Re-Sale Registration Statement, providing for the resale of the shares of common stock issuable upon exercise of the Private Warrants, use commercially reasonable efforts to cause such registration statement to become effective within 60 days following the closing date of this offering (or 90 days following the closing date in the event of a full review by the SEC) and to keep such registration statement effective at all times until the investor owns no Private Warrants or shares of common stock issuable upon exercise thereof.

### ***Exchange Listing***

We do not intend to list the Private Warrants on any securities exchange or nationally recognized trading system.

### ***Rights as a Stockholder***

Except as otherwise provided in the Private Warrants or by virtue of such holder's ownership of common stock, the holders of the Private Warrants do not have the rights or privileges of holders of our common stock, including any voting rights, until they exercise the Private Warrants.

## PLAN OF DISTRIBUTION

Pursuant to an engagement letter agreement dated June 15, 2025 (the “Engagement Letter”), we have engaged H.C. Wainwright & Co, LLC (the “Placement Agent”) to act as our exclusive placement agent in connection with this offering. Under the terms of the Engagement Letter, the Placement Agent is not purchasing the securities offered by us in this offering, and is not required to sell any specific number or dollar amount of securities, but will assist us in this offering on a reasonable best-efforts basis. The terms of this offering were subject to market conditions and negotiations between us, the Placement Agent and prospective investors. The Placement Agent will have no authority to bind us by virtue of the Engagement Letter. The Placement Agent may engage sub-agents or selected dealers to assist with this offering. We may not sell the entire amount of the securities offered pursuant to this prospectus supplement.

The Placement Agent proposes to arrange for the sale of the shares we are offering pursuant to this prospectus supplement and accompanying prospectus to one or more institutional or accredited investors through securities purchase agreements directly between the purchaser and us. We will only sell to such investors who have entered into the securities purchase agreement with us.

We have agreed to indemnify the placement agent against specified liabilities, including liabilities under the Securities Act, and to contribute to payments the Placement Agent may be required to make in respect thereof.

Pursuant to the terms of the securities purchase agreement, from the date hereof until 90 days after the date that the Re-Sale Registration Statement is declared effective, we may not issue, enter into any agreement to issue or announce the issuance or proposed issuance of any shares of common stock or common stock equivalents, subject to certain exceptions set forth in the securities purchase agreement.

In addition, we have also agreed with the purchasers of our common stock, subject to certain exceptions, from the date of this prospectus supplement until one year after the closing date of this offering, that we will not effect or enter into an agreement to effect a “Variable Rate Transaction” as defined in the securities purchase agreement.

### Fees and Expenses

We have agreed to pay the Placement Agent a placement agent fee equal to 7.0% of the aggregate purchase price of the securities sold in this offering. The following table shows the per share and total cash Placement Agent’s fees we will pay to the Placement Agent in connection with the sale of the securities offered pursuant to this prospectus supplement and the accompanying prospectus, assuming the purchase of all of the securities offered hereby.

	<u>Per Share</u>	<u>Per Pre-Funded Warrant Underlying Share</u>	<u>Total</u>
Offering Price	\$ 11.81	\$ 11.809	\$ 4,999,872.96
Placement agent’s fees(1)	\$ 0.8267	\$ 0.8267	\$ 350,001.63
Proceeds, before expenses, to us	\$ 10.9833	\$ 10.9823	\$ 4,649,871.33

- (1) We have also agreed to reimburse the Placement Agent for certain expenses incurred in connection with this offering, discussed below. In addition, in connection with any future exercise of the Private Warrants, we have agreed to pay the Placement Agent a cash fee equal to 6.5% of the aggregate gross exercise price paid in cash with respect to the exercise of such Private Warrants. A portion of the cash fee payable to the Placement Agent will be retained by us for the payment of certain agreed expenses incurred by us in connection with the offering.

We have also agreed to reimburse the Placement Agent \$35,000 for its non-accountable expenses, \$50,000 for fees and expenses of its legal counsel and other out-of-pocket expenses and \$15,950 for its clearing fees. We estimate that the total expenses of the offering payable by us, excluding the Placement Agent’s fees and expenses, will be approximately \$150,000.

The Placement Agent may be deemed to be an underwriter within the meaning of Section 2(a)(11) of the Securities Act, and any commissions received by them and any profit realized on the resale of the shares sold by

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them while acting as principals might be deemed to be underwriting discounts or commissions under the Securities Act. As an underwriter, the Placement Agent would be required to comply with the requirements of the Securities Act and the Securities Exchange Act of 1934, as amended, or the Exchange Act, including, without limitation, Rule 415(a)(4) under the Securities Act and Rule 10b-5 and Regulation M under the Exchange Act. These rules and regulations may limit the timing of purchases and sales of shares by the placement agent acting as principal. Under these rules and regulations, the Placement Agent:

- may not engage in any stabilization activity in connection with our securities; and
- may not bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities, other than as permitted under the Exchange Act, until it has completed its participation in the distribution.

This prospectus supplement and the accompanying prospectus may be made available in electronic format on websites or through other online services maintained by the placement agent or by an affiliate of the Placement Agent. Other than this prospectus supplement and the accompanying prospectus, the information on the Placement Agent's website and any information contained in any other website maintained by the Placement Agent is not part of this prospectus supplement and the accompanying prospectus or the registration statement of which this prospectus supplement and the accompanying prospectus form a part, has not been approved and/or endorsed by us or the placement agent, and should not be relied upon by investors.

The foregoing does not purport to be a complete statement of the terms and conditions of the securities purchase agreement and other documentation associated with this offering. A copy of such documents will be included as an exhibit to an SEC filing and incorporated by reference into the registration statement of which this prospectus supplement and the accompanying prospectus form a part. See "Where You Can Find More Information; Incorporation by Reference".

No action has been or will be taken in any jurisdiction (except in the United States) that would permit a public offering of the securities offered by this prospectus supplement and accompanying prospectus, or the possession, circulation or distribution of this prospectus supplement and accompanying prospectus or any other material relating to us or the securities offered hereby in any jurisdiction where action for that purpose is required. Accordingly, the securities offered hereby may not be offered or sold, directly or indirectly, and neither of this prospectus supplement and accompanying prospectus nor any other offering material or advertisements in connection with the securities offered hereby may be distributed or published, in or from any country or jurisdiction except in compliance with any applicable rules and regulations of any such country or jurisdiction. The Placement Agent may arrange to sell securities offered by this prospectus supplement and accompanying prospectus in certain jurisdictions outside the United States, either directly or through affiliates, where it is permitted to do so.

### **Relationships**

The Placement Agent and its affiliates may provide from time to time in the future certain commercial banking, financial advisory, investment banking and other services for us in the ordinary course of their business, for which they may receive customary fees and commissions. In addition, from time to time, the Placement Agent and its affiliates may effect transactions for their own accounts or the account of customers, and hold on behalf of themselves or their customers, long or short positions in our debt or equity securities or loans, and may do so in the future. Except as disclosed in this prospectus supplement, we have no present arrangements with the Placement Agent for any further services.

### **Transfer Agent and Registrar**

The transfer agent and registrar for our common stock is Equiniti Trust Company, LLC.

### **Listing**

Our common stock is traded on the Nasdaq Capital Market under the symbol "LYRA."

## LEGAL MATTERS

The validity of the securities offered hereby will be passed upon for us by Latham & Watkins LLP, Lowenstein Sandler LLP, New York, New York, is counsel to the Placement Agent in connection with this offering.

## EXPERTS

The consolidated financial statements of Lyra Therapeutics, 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 and in the Registration Statement have been so incorporated in reliance on the report of BDO USA, P.C., an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting. The report on the consolidated financial statements contains an explanatory paragraph regarding our ability to continue as a going concern.

## WHERE YOU CAN FIND MORE INFORMATION; INCORPORATION BY REFERENCE

### Available Information

We file reports, proxy statements and other information with the SEC. The SEC maintains a web site that contains reports, proxy and information statements and other information about issuers, such as us, who file electronically with the SEC. The address of that website is [www.sec.gov](http://www.sec.gov).

Our web site address is [www.lyratherapeutics.com](http://www.lyratherapeutics.com). The information on our web site, however, is not, and should not be deemed to be, a part of this prospectus supplement.

This prospectus supplement and the accompanying prospectus are part of a registration statement that we filed with the SEC and do not contain all of the information in the registration statement. The full registration statement may be obtained from the SEC or us, as provided below. Other documents establishing the terms of the offered securities are or may be filed as exhibits to the registration statement. Statements in this prospectus supplement about these documents are summaries and each statement is qualified in all respects by reference to the document to which it refers. You should refer to the actual documents for a more complete description of the relevant matters. You may inspect a copy of the registration statement through the SEC's website, as provided above.

### Incorporation by Reference

The SEC's rules allow us to "incorporate by reference" information into this prospectus supplement and the accompanying prospectus, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is deemed to be part of this prospectus supplement and the accompanying prospectus, and subsequent information that we file with the SEC will automatically update and supersede that information. Any statement contained in a previously filed document incorporated by reference will be deemed to be modified or superseded for purposes of this prospectus supplement and the accompanying prospectus to the extent that a statement contained in this prospectus supplement or the accompanying prospectus modifies or replaces that statement.

We incorporate by reference the following information or documents that we have filed with the SEC:

- Our Annual Report on [Form 10-K](#) for the year ended December 31, 2024, filed with the SEC on March 13, 2025.

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- Our Quarterly Report on [Form 10-Q](#) for the quarter ended March 31, 2025, filed with the SEC on May 6, 2025.
- Our Current Reports on Form 8-K filed with the SEC on [May 19, 2025](#), [June 2, 2025](#) (solely with respect to Items 5.03 and 8.01), [June 9, 2025](#) and [June 23, 2025](#).
- Our annual Proxy Statement on [Schedule 14A](#) relating to our annual meeting of stockholders, filed on April 4, 2025 (with respect to those portions incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2024).
- The description of our Common Stock filed as [Exhibit 4.8](#) in our Annual Report on Form 10-K for the year ended December 31, 2024, and any amendment or report filed with the SEC for the purpose of updating the description.

We incorporate by reference into this prospectus supplement and accompanying prospectus all reports and other documents we subsequently file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, between the date of this prospectus supplement and the termination of the offering of the securities described in this prospectus supplement. We are not, however, incorporating by reference any documents or portions thereof, whether specifically listed above or filed in the future, that are not deemed “filed” with the SEC, including any information furnished pursuant to Items 2.02 or 7.01 of Form 8-K or related exhibits furnished pursuant to Item 9.01 of Form 8-K. The reports and documents specifically listed above or filed in the future (excluding any information furnished to, rather than filed with, the SEC) are deemed to be part of this prospectus supplement and accompanying prospectus from the date of the filing of such reports and documents.

You may request a free copy of any of the documents incorporated by reference in this prospectus supplement and the accompanying prospectus (other than exhibits, unless they are specifically incorporated by reference in the documents) by writing or telephoning us at the following address:

**Lyra Therapeutics, Inc.**  
**480 Arsenal Way**  
**Watertown, MA 02472**  
**(617) 393-4600**

Exhibits to the filings will not be sent, however, unless those exhibits have specifically been incorporated by reference in this prospectus supplement and the accompanying prospectus.

PROSPECTUS



**Lyra Therapeutics, Inc.**

**\$300,000,000**

**Common Stock  
Preferred Stock  
Debt Securities  
Warrants  
Units**

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We may offer and sell up to \$300,000,000 in the aggregate of the securities identified above from time to time in one or more offerings. This prospectus provides you with a general description of the securities and the general manner in which these securities will be offered.

Each time we offer and sell securities, we will provide a supplement to this prospectus that contains specific information about the offering and the amounts, prices and terms of the securities. The prospectus supplement will also describe the specific manner in which these securities will be offered and may also add, update or change information contained in this prospectus with respect to that offering. You should carefully read this prospectus and the applicable prospectus supplement before you invest in any of our securities.

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We may offer and sell the securities described in this prospectus and any prospectus supplement to or through one or more underwriters, dealers and agents, or directly to purchasers, or through a combination of these methods. If any underwriters, dealers or agents are involved in the sale of any of the securities, their names and any applicable purchase price, fee, commission or discount arrangement between or among them will be set forth, or will be calculable from the information set forth, in the applicable prospectus supplement. See the sections of this prospectus entitled "About this Prospectus" and "Plan of Distribution" for more information. No securities may be sold without delivery of this prospectus and the applicable prospectus supplement describing the method and terms of the offering of such securities.

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**INVESTING IN OUR SECURITIES INVOLVES RISKS. SEE THE "[RISK FACTORS](#)" ON PAGE 5 OF THIS PROSPECTUS AND ANY SIMILAR SECTION CONTAINED IN THE APPLICABLE PROSPECTUS SUPPLEMENT CONCERNING FACTORS YOU SHOULD CONSIDER BEFORE INVESTING IN OUR SECURITIES.**

Our common stock is listed on the Nasdaq Capital Market under the symbol "LYRA." On March 21, 2024, the last reported sale price of our common stock on the Nasdaq Global Market was \$6.07 per share.

**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.**

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**The date of this prospectus is April 1, 2024.**

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## ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the U.S. Securities and Exchange Commission, or the SEC, using a “shelf” registration process. By using a shelf registration statement, we may sell securities from time to time and in one or more offerings up to a total dollar amount of \$300,000,000 as described in this prospectus. Each time that we offer and sell securities, we will provide a prospectus supplement to this prospectus that contains specific information about the securities being offered and sold and the specific 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 or free writing prospectus may also add, update or change information contained in this prospectus with respect to that offering. If there is any inconsistency between the information in this prospectus and the applicable prospectus supplement or free writing prospectus, you should rely on the prospectus supplement or free writing prospectus, as applicable. Before purchasing any securities, you should carefully read both this prospectus and the applicable prospectus supplement (and any applicable free writing prospectuses), together with the additional information described under the heading “Where You Can Find More Information; Incorporation by Reference.”

We have not authorized anyone to provide you with any information or to make any representations other than those contained in this prospectus, any applicable prospectus supplement or any free writing prospectuses prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We will not make an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus and the applicable prospectus supplement to this prospectus is accurate only as of the date on its respective cover, that the information appearing in any applicable free writing prospectus is accurate only as of the date of that free writing prospectus, and that any information incorporated by reference is accurate only as of the date of the document incorporated by reference, unless we indicate otherwise. Our business, financial condition, results of operations and prospects may have changed since those dates. This prospectus incorporates by reference, and any prospectus supplement or free writing prospectus may contain and incorporate by reference, market data and industry statistics and forecasts that are based on independent industry publications and other publicly available information. Although we believe these sources are reliable, we do not guarantee the accuracy or completeness of this information and we have not independently verified this information. In addition, the market and industry data and forecasts that may be included or incorporated by reference in this prospectus, any prospectus supplement or any applicable free writing prospectus may involve estimates, assumptions and other risks and uncertainties and are subject to change based on various factors, including those discussed under the heading “Risk Factors” contained in this prospectus, the applicable prospectus supplement and any applicable free writing prospectus, and under similar headings in other documents that are incorporated by reference into this prospectus. Accordingly, investors should not place undue reliance on this information.

When we refer to “Lyra,” “we,” “our,” “us” and the “Company” in this prospectus, we mean Lyra Therapeutics, Inc. and its consolidated subsidiaries, unless otherwise specified. When we refer to “you,” we mean the potential holders of the applicable series of securities.

## WHERE YOU CAN FIND MORE INFORMATION; INCORPORATION BY REFERENCE

### Available Information

We file reports, proxy statements and other information with the SEC. The SEC maintains a website that contains reports, proxy and information statements and other information about issuers, such as us, who file electronically with the SEC. The address of that website is <http://www.sec.gov>.

Our website address is [www.lyrtherapeutics.com](http://www.lyrtherapeutics.com). The information on our website, however, is not, and should not be deemed to be, a part of this prospectus.

This prospectus and any prospectus supplement are part of a registration statement that we filed with the SEC and do not contain all of the information in the registration statement. The full registration statement may be obtained from the SEC or us, as provided below. Forms of the indenture and other documents establishing the terms of the offered securities are or may be filed as exhibits to the registration statement or documents incorporated by reference in the registration statement. Statements in this prospectus or any prospectus supplement about these documents are summaries and each statement is qualified in all respects by reference to the document to which it refers. You should refer to the actual documents for a more complete description of the relevant matters. You may inspect a copy of the registration statement through the SEC's website, as provided above.

### Incorporation by Reference

The SEC's rules allow us to "incorporate by reference" information into this prospectus, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is deemed to be part of this prospectus, and subsequent information that we file with the SEC will automatically update and supersede that information. Any statement contained in this prospectus or a previously filed document incorporated by reference will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus or a subsequently filed document incorporated by reference modifies or replaces that statement.

This prospectus and any accompanying prospectus supplement incorporate by reference the documents set forth below that have previously been filed with the SEC (other than those documents or the portions of those documents not deemed to be filed):

- Our Annual Report on [Form 10-K](#) for the year ended December 31, 2023, filed with the SEC on March 22, 2024.
- Our Current Reports on Form 8-K filed with the SEC on [January 8, 2024](#) (solely with respect to the information filed under Item 8.01) and [March 1, 2024](#).
- The description of our Common Stock contained in our Registration Statement on [Form 8-A](#), filed with the SEC on April 27, 2020, pursuant to Section 12(b) of the Securities Act, as updated by "Description of Securities" filed as [Exhibit 4.5](#) to our Annual Report on [Form 10-K](#) for the year ended December 31, 2022, and any amendment or report filed with the SEC for the purpose of updating the description.

All reports and other documents we subsequently file pursuant to Section 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, which we refer to as the "Exchange Act" in this prospectus, prior to the termination of this offering, including all such documents we may file with the SEC after the date of the initial registration statement and prior to the effectiveness of the registration statement, but excluding any information furnished to, rather than filed with, the SEC, will also be incorporated by reference into this prospectus and deemed to be part of this prospectus from the date of the filing of such reports and documents.

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You may request a free copy of any of the documents incorporated by reference in this prospectus by writing or telephoning us at the following address:

Lyra Therapeutics, Inc.  
480 Arsenal Way  
Watertown, MA 02472  
(617) 393-4600

Exhibits to the filings will not be sent, however, unless those exhibits have specifically been incorporated by reference in this prospectus or any accompanying prospectus supplement.

## THE COMPANY

We are a clinical-stage biotechnology company focused on the development and commercialization of innovative, anti-inflammatory therapies for the localized treatment of patients with chronic rhinosinusitis, or CRS. Our product candidates, LYR-210 and LYR-220, are bioabsorbable nasal inserts designed to be administered in a simple, in-office procedure and intended to deliver six months of continuous anti-inflammatory drug therapy to the sinonasal passages for the treatment of CRS with a single administration. The drug embedded within LYR-210 and LYR-220 is mometasone furoate, or MF, which is the active ingredient in various U.S. Food and Drug Administration, or FDA, approved drugs and has a well-established efficacy and safety profile. CRS is an inflammatory disease of the paranasal sinuses which leads to debilitating symptoms and significant morbidities and affects approximately 14 million people in the United States.

### LYR-210

LYR-210 is designed to treat CRS patients who have failed previous medical management. LYR-210 has a smaller dimension and is intended for patients with narrow anatomy, primarily patients who have not undergone ethmoid sinus surgery. A pivotal Phase 3 program of LYR-210, called the ENLIGHTEN program, consists of two pivotal trials and is currently ongoing.

### LYR-220

Our second pipeline product candidate, LYR-220, is designed for use in CRS patients who continue to require treatment to manage CRS symptoms despite having had ethmoid sinus surgery. LYR-220 employs a larger matrix designed for patients whose nasal cavity is larger including those patients whose nasal cavity is larger after having undergone ethmoid sinus surgery. A Phase 2 clinical trial of LYR-220, called BEACON, has recently concluded and topline data have been presented.

We were incorporated under the laws of the state of Delaware in November 2005 under the name WMR Biomedical, Inc. In July 2018, we changed our name to Lyra Therapeutics, Inc. Our principal executive offices are located at 480 Arsenal Way, Watertown, MA 02472 and our telephone number is (617) 393-4600. Our website address is [www.lyratx.com](http://www.lyratx.com). The information contained in, or accessible through, our website does not constitute a part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference. Our common stock is listed on the Nasdaq Global Market under the symbol "LYRA".

## **RISK FACTORS**

Investment in any securities offered pursuant to this prospectus and the applicable prospectus supplement involves risks. Before deciding whether to invest in our securities, you should carefully consider the risk factors incorporated by reference to our most recent Annual Report on Form 10-K and any subsequent Quarterly Reports on Form 10-Q or Current Reports on Form 8-K, and all other information contained or 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 the applicable prospectus supplement and any applicable free writing prospectus. The occurrence of any of these risks might cause you to lose all or part of your investment in the offered securities. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could be seriously harmed. This could cause the trading price of our securities to decline, resulting in a loss of all or part of your investment. Please also carefully read the section entitled “Forward-Looking Statements” included in our most recent Annual Report on Form 10-K and any subsequent Quarterly Reports on Form 10-Q or Current Reports on Form 8-K.

**USE OF PROCEEDS**

We intend to use the net proceeds from the sale of the securities as set forth in the applicable prospectus supplement.

## DESCRIPTION OF CAPITAL STOCK

The following description of our securities and certain provisions of our restated certificate of incorporation, which we refer to as our certificate of incorporation, and our amended and restated bylaws, which we refer to as our bylaws, are summaries and are qualified in their entirety by reference to the full text of our certificate of incorporation, our bylaws and the applicable securities, each of which has been publicly filed with the SEC, and the applicable provisions of the General Corporation Law of the State of Delaware, or the DGCL. See “Where You Can Find More Information; Incorporation by Reference.” Our authorized capital stock consists of:

- 200,000,000 shares of common stock, par value \$0.001 per share; and
- 10,000,000 shares of preferred stock, par value \$0.001 per share.

### Common Stock

Our common stock is listed on the Nasdaq Global Market under the symbol “LYRA.”

*Voting Rights.* Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders shall be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Subject to the supermajority votes for some matters, other matters shall be decided by the affirmative vote of our stockholders having a majority in voting power of the votes cast by the stockholders present or represented and voting on such matter. Our certificate of incorporation and bylaws also provide that our directors may be removed only for cause and only by the affirmative vote of the holders of at least two-thirds in voting power of the outstanding shares of capital stock entitled to vote thereon. In addition, the affirmative vote of the holders of at least two-thirds in voting power of the outstanding shares of capital stock entitled to vote thereon is required to amend or repeal, or to adopt any provision inconsistent with, several of the provisions of our certificate of incorporation. See below under “—Anti-Takeover Effects of Delaware Law and Our Certificate of Incorporation and Bylaws—Amendment of Charter Provisions.”

*Rights Upon Liquidation.* In the event of our liquidation or dissolution, the holders of common stock are entitled to receive proportionately our net assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock.

*Other Rights.* Holders of common stock have no preemptive, subscription, redemption or conversion rights. Our outstanding shares of common stock are, and the shares offered by us in this offering will be, when issued and paid for, validly issued, fully paid and nonassessable. The rights, preferences and privileges of 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 and issue in the future.

### Transfer Agent

The transfer agent and registrar for our common stock is Equiniti Trust Company, LLC.

### Dividend

Holders of common stock are entitled to receive proportionately any dividends as may be declared by our board of directors, subject to any preferential dividend rights of outstanding preferred stock. On March 20, 2012, we declared and paid a special cash dividend of \$0.2630467 per share of our common stock, or the Special Dividend, which totaled approximately \$42,115 in the aggregate. Other than the Special Dividend, we have never declared or paid any cash dividends on our common stock. We do not intend to pay cash dividends for the foreseeable future. We currently expect to retain all future earnings, if any, for use in the development, operation and expansion of our business. Any determination to pay cash dividends in the future will depend upon, among

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other things, our results of operations, plans for expansion, tax considerations, available net profits and reserves, limitations under law, financial condition, capital requirements and other factors that our board of directors considers to be relevant.

### **Preferred Stock**

Under the terms of our certificate of incorporation, our board of directors is authorized to direct us to issue shares of preferred stock in one or more series without stockholder approval. Our board of directors has the discretion to determine the rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences, of each series of preferred stock.

The purpose of authorizing our board of directors to issue preferred stock and determine its rights and preferences is to eliminate delays associated with a stockholder vote on specific issuances. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions, future financings and other corporate purposes, could have the effect of making it more difficult for a third party to acquire, or could discourage a third party from seeking to acquire, a majority of our outstanding voting stock. There are no shares of preferred stock outstanding, and we have no present plans to issue any shares of preferred stock.

### **Options**

As of December 31, 2023, options to purchase an aggregate of 5,709,980 shares of our common stock were outstanding under our 2005 Equity Incentive Plan, 2016 Equity Incentive Plan, 2020 Equity Incentive Plan and 2022 Employment Inducement Award Plan, at a weighted-average exercise price of \$5.68 per share.

### **Registration Rights**

Certain holders of shares of our common stock are entitled to certain rights with respect to the registration of such shares for public resale under the Securities Act, pursuant to our ninth amended and restated investors' rights agreement, as amended, or the investor rights agreement, until the rights otherwise terminate pursuant to the terms of the investor rights agreement. The registration of shares of common stock as a result of the following rights being exercised would enable holders to trade these shares without restriction under the Securities Act when the applicable registration statement is declared effective.

#### ***Form S-1 Registration Rights***

If at any time the holders of at least 30% of the registrable securities then outstanding request in writing that we effect a registration with respect to all or part of such registrable securities then outstanding having an anticipated aggregate offering price that would exceed \$5,000,000, we may be required to register their shares. We are obligated to effect at most (i) three registrations initiated by Perceptive Life Sciences Master Fund Ltd and Perceptive LS (A), LLC, collectively referred to as Perceptive, and (ii) three registrations covering registrable securities held by investors other than Perceptive, in each case, in response to these demand registration rights. If the holders requesting registration intend to distribute their shares by means of an underwriting, the managing underwriter of such offering will have the right to limit the numbers of shares to be underwritten for reasons related to the marketing of the shares.

#### ***Piggyback Registration Rights***

If at any time we propose to register any shares of our common stock under the Securities Act, subject to certain exceptions, the holders of registrable securities then outstanding will be entitled to notice of the registration and to include their shares of registrable securities in the registration. If our proposed registration involves an underwriting, the managing underwriter of such offering will have the right to limit the number of shares to be underwritten for reasons related to the marketing of the shares.

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### ***Form S-3 Registration Rights***

If, at any time after we become entitled under the Securities Act to register our shares on a registration statement on Form S-3, the holders of the registrable securities then outstanding request in writing that we effect a registration with respect to all or part of such registrable securities having an anticipated aggregate offering price to the public in the offering of at least \$2,000,000, we will be required to effect such registration; provided, however, that we will not be required to effect such a registration if, within any twelve month period, we have already effected two registrations on Form S-3 for the holders of registrable securities.

### ***Waiver of Registration Rights***

The holders of registrable securities outstanding as of the date hereof have entered into a waiver of their notice and registration rights in connection with the filing of this registration statement.

### ***Termination of Registration Rights***

The registration rights terminate upon the earlier of the date on which no stockholder holds any registrable securities, the closing of a company sale, as defined in the investor rights agreement, at such time as SEC Rule 144 or another similar exemption under the Securities Act is available for the sale of all of a stockholder's shares without limitation during a three-month period without registration, at such time a stockholder is not an affiliate (as defined under the Securities Act) of the Company or May 5, 2028.

### ***Private Placement Registration Rights***

We agreed to prepare and file with the SEC a registration statement by no later than May 12, 2022 covering the public resale pursuant to the Securities Act of certain shares of our common stock issued, and certain shares of our common stock issuable upon exercise of the 2022 Pre-Funded Warrants issued, in each case, pursuant to a securities purchase agreement dated April 7, 2022, and have further agreed to use commercially reasonable efforts to have such registration statement declared effective as soon as reasonably practicable after the filing thereof, but in no event later than June 11, 2022, or July 11, 2022 if the SEC reviews the registration statement. A registration statement on Form S-3 was filed with the SEC on May 11, 2022 in accordance with the aforementioned obligations.

We also agreed to prepare and file with the SEC a registration statement by no later than June 30, 2023 covering the public resale pursuant to the Securities Act of certain shares of our common stock issued, and certain shares of our common stock issuable upon exercise of the 2023 Pre-Funded Warrants and the 2023 Purchase Warrants, in each case, pursuant to a securities purchase agreement dated May 25, 2023, and have further agreed to use commercially reasonable efforts to have such registration statement declared effective as soon as reasonably practicable after the filing thereof, but in no event later than July 30, 2023, or August 29, 2023 if the SEC reviews the registration statement. A registration statement on Form S-3 was filed with the SEC on June 28, 2023 in accordance with the aforementioned obligations.

### ***Expenses and Indemnification***

Ordinarily, other than underwriting discounts (it being understood that the selling securityholders shall not be deemed to be underwriters solely as a result of their participation in this offering) and commissions, we will be required to pay all expenses incurred by us related to any registration effected pursuant to the exercise of these registration rights. These expenses may include all registration and filing fees, printing expenses, fees and disbursements of our counsel, reasonable fees and disbursements of a counsel for the selling securityholders and blue sky fees and expenses. Additionally, we have agreed to indemnify selling securityholders for damages, and any legal or other expenses reasonably incurred, arising from or based upon any untrue statement of a material fact contained in any registration statement, an omission or alleged omission to state a material fact in any registration statement or necessary to make the statements therein not misleading, or any violation or alleged violation by the indemnifying party of securities laws, subject to certain exceptions.

## **Anti-Takeover Effects of Delaware Law and Our Certificate of Incorporation and Bylaws**

Some provisions of Delaware law, our certificate of incorporation and our bylaws could make the following transactions more difficult: an acquisition of us by means of a tender offer; an acquisition of us by means of a proxy contest or otherwise; or the removal of our incumbent officers and directors. It is possible that these provisions could make it more difficult to accomplish or could deter transactions that stockholders may otherwise consider to be in their best interest or in our best interests, 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 unfriendly or unsolicited 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.

*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 could impede the success of any attempt to change control of us. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of our company.

*Stockholder Meetings.* Our bylaws provide that a special meeting of stockholders may be called only by our chairman of the board, chief executive officer or president (in the absence of a chief executive officer), or by a resolution adopted by a majority of our board of directors.

*Requirements for Advance Notification of Stockholder Nominations and Proposals.* Our 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.

*Elimination of Stockholder Action by Written Consent.* Our certificate of incorporation eliminates the right of stockholders to act by written consent without a meeting.

*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 tend to 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 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 the holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote in the election of directors.

*Stockholders Not Entitled to Cumulative Voting.* Our 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.

*Delaware Anti-Takeover Statute.* We are subject to Section 203 of the DGCL, which prohibits persons deemed to be “interested stockholders” from engaging in a “business combination” with a publicly held

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Delaware corporation for three years following the date these persons become interested stockholders unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. Generally, an “interested stockholder” is a person who, together with affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation’s voting stock. Generally, a “business combination” includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. The existence of this provision may have an anti-takeover effect with respect to transactions not approved in advance by the board of directors.

*Choice of Forum.* Our certificate of incorporation provides that, unless we consent in writing to the selection of an alternative form, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for: (1) any derivative action or proceeding brought on our behalf; (2) any action asserting a claim of breach of a fiduciary duty or other wrongdoing by any of our directors, officers, employees or stockholders to us or our stockholders; (3) any action asserting a claim against us arising pursuant to any provision of the General Corporation Law of the State of Delaware or our certificate of incorporation or bylaws; or (4) any action asserting a claim governed by the internal affairs doctrine. Under our certificate of incorporation, this exclusive forum provision will not apply to claims which are vested in the exclusive jurisdiction of a court or forum other than the Court of Chancery of the State of Delaware, or for which the Court of Chancery of the State of Delaware does not have subject matter jurisdiction. For instance, the provision would not apply to actions arising under federal securities laws, including suits brought to enforce any liability or duty created by the Securities Act, Exchange Act, or the rules and regulations thereunder. Our certificate of incorporation further 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 sole and exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. Our certificate of incorporation also provides that any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock will be deemed to have notice of and to have consented to these choice of forum provisions. It is possible that a court of law could rule that either or both of the choice of forum provisions contained in our certificate of incorporation is inapplicable or unenforceable if it is challenged in a proceeding or otherwise.

*Amendment of Charter 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 and the provision prohibiting cumulative voting, would require approval by holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote thereon.

The provisions of Delaware law, our certificate of incorporation and our 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.

## DESCRIPTION OF DEBT SECURITIES

The following description, together with the additional information we include in any applicable prospectus supplement or free writing prospectus, summarizes certain general terms and provisions of the debt securities that we may offer under this prospectus. When we offer to sell a particular series of debt securities, we will describe the specific terms of the series in a supplement to this prospectus. We will also indicate in the supplement to what extent the general terms and provisions described in this prospectus apply to a particular series of debt securities.

We may issue debt securities either separately, or together with, or upon the conversion or exercise of or in exchange for, other securities described in this prospectus. Debt securities may be our senior, senior subordinated or subordinated obligations and, unless otherwise specified in a supplement to this prospectus, the debt securities will be our direct, unsecured obligations and may be issued in one or more series.

The debt securities will be issued under an indenture between us and a trustee. We have summarized select portions of the indenture below. The summary is not complete. The form of the indenture has been filed as an exhibit to the registration statement and you should read the indenture for provisions that may be important to you. In the summary below, we have included references to the section numbers of the indenture so that you can easily locate these provisions. Capitalized terms used in the summary and not defined herein have the meanings specified in the indenture.

As used in this section only, “Lyra,” “we,” “our” or “us” refer to Lyra Therapeutics, excluding our subsidiaries, unless expressly stated or the context otherwise requires.

### General

The terms of each series of debt securities will be established by or pursuant to a resolution of our board of directors and set forth or determined in the manner provided in a resolution of our board of directors, in an officer’s certificate or by a supplemental indenture. (Section 2.2) The particular terms of each series of debt securities will be described in a prospectus supplement relating to such series (including any pricing supplement or term sheet).

We can issue an unlimited amount of debt securities under the indenture that may be in one or more series with the same or various maturities, at par, at a premium, or at a discount. (Section 2.1) We will set forth in a prospectus supplement (including any pricing supplement or term sheet) relating to any series of debt securities being offered, the aggregate principal amount and the following terms of the debt securities, if applicable:

- the title and ranking of the debt securities (including the terms of any subordination provisions);
- the price or prices (expressed as a percentage of the principal amount) at which we will sell the debt securities;
- any limit on the aggregate principal amount of the debt securities;
- the date or dates on which the principal of the securities of the series is payable;
- the rate or rates (which may be fixed or variable) per annum or the method used to determine the rate or rates (including any commodity, commodity index, stock exchange index or financial index) at which the debt securities will bear interest, the date or dates from which interest will accrue, the date or dates on which interest will commence and be payable and any regular record date for the interest payable on any interest payment date;
- the place or places where principal of, and interest, if any, on the debt securities will be payable (and the method of such payment), where the securities of such series may be surrendered for registration of transfer or exchange, and where notices and demands to us in respect of the debt securities may be delivered;

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- the period or periods within which, the price or prices at which and the terms and conditions upon which we may redeem the debt securities;
- any obligation we have to redeem or purchase the debt securities pursuant to any sinking fund or analogous provisions or at the option of a holder of debt securities and the period or periods within which, the price or prices at which and in the terms and conditions upon which securities of the series shall be redeemed or purchased, in whole or in part, pursuant to such obligation;
- the dates on which and the price or prices at which we will repurchase debt securities at the option of the holders of debt securities and other detailed terms and provisions of these repurchase obligations;
- the denominations in which the debt securities will be issued, if other than denominations of \$1,000 and any integral multiple thereof;
- whether the debt securities will be issued in the form of certificated debt securities or global debt securities;
- the portion of principal amount of the debt securities payable upon declaration of acceleration of the maturity date, if other than the principal amount;
- the currency of denomination of the debt securities, which may be United States Dollars or any foreign currency, and if such currency of denomination is a composite currency, the agency or organization, if any, responsible for overseeing such composite currency;
- the designation of the currency, currencies or currency units in which payment of principal of, premium and interest on the debt securities will be made;
- if payments of principal of, premium or interest on the debt securities will be made in one or more currencies or currency units other than that or those in which the debt securities are denominated, the manner in which the exchange rate with respect to these payments will be determined;
- the manner in which the amounts of payment of principal of, premium, if any, or interest on the debt securities will be determined, if these amounts may be determined by reference to an index based on a currency or currencies or by reference to a commodity, commodity index, stock exchange index or financial index;
- any provisions relating to any security provided for the debt securities;
- any addition to, deletion of or change in the Events of Default described in this prospectus or in the indenture with respect to the debt securities and any change in the acceleration provisions described in this prospectus or in the indenture with respect to the debt securities;
- any addition to, deletion of or change in the covenants described in this prospectus or in the indenture with respect to the debt securities;
- any depositaries, interest rate calculation agents, exchange rate calculation agents or other agents with respect to the debt securities;
- the provisions, if any, relating to conversion or exchange of any debt securities of such series, including if applicable, the conversion or exchange price and period, provisions as to whether conversion or exchange will be mandatory, the events requiring an adjustment of the conversion or exchange price and provisions affecting conversion or exchange;
- any other terms of the debt securities, which may supplement, modify or delete any provision of the indenture as it applies to that series, including any terms that may be required under applicable law or regulations or advisable in connection with the marketing of the securities; and
- whether any of our direct or indirect subsidiaries will guarantee the debt securities of that series, including the terms of subordination, if any, of such guarantees. (Section 2.2)

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We may issue debt securities that provide for an amount less than their stated principal amount to be due and payable upon declaration of acceleration of their maturity pursuant to the terms of the indenture. We will provide you with information on certain U.S. federal income tax considerations and other special considerations applicable to any of these debt securities in the applicable prospectus supplement.

If we denominate the purchase price of any of the debt securities in a foreign currency or currencies or a foreign currency unit or units, or if the principal of and any premium and interest on any series of debt securities is payable in a foreign currency or currencies or a foreign currency unit or units, we will provide you with information on the restrictions, elections, certain U.S. federal income tax considerations, specific terms and other information with respect to that issue of debt securities and such foreign currency or currencies or foreign currency unit or units in the applicable prospectus supplement.

### **Transfer and Exchange**

Each debt security will be represented by either one or more global securities registered in the name of The Depository Trust Company, or the Depository, or a nominee of the Depository (we will refer to any debt security represented by a global debt security as a “book-entry debt security”), or a certificate issued in definitive registered form (we will refer to any debt security represented by a certificated security as a “certificated debt security”) as set forth in the applicable prospectus supplement. Except as set forth under the heading “Global Debt Securities and Book-Entry System” below, book-entry debt securities will not be issuable in certificated form.

**Certificated Debt Securities.** You may transfer or exchange certificated debt securities at any office we maintain for this purpose in accordance with the terms of the indenture. (Section 2.4) No service charge will be made for any transfer or exchange of certificated debt securities, but we may require payment of a sum sufficient to cover any tax or other governmental charge payable in connection with a transfer or exchange. (Section 2.7)

You may effect the transfer of certificated debt securities and the right to receive the principal of, premium and interest on certificated debt securities only by surrendering the certificate representing those certificated debt securities and either reissuance by us or the trustee of the certificate to the new holder or the issuance by us or the trustee of a new certificate to the new holder.

**Global Debt Securities and Book-Entry System.** Each global debt security representing book-entry debt securities will be deposited with, or on behalf of, the Depository, and registered in the name of the Depository or a nominee of the Depository. Please see “Global Securities.”

### **Covenants**

We will set forth in the applicable prospectus supplement any restrictive covenants applicable to any issue of debt securities. (Article IV)

### **No Protection in the Event of a Change of Control**

Unless we state otherwise in the applicable prospectus supplement, the debt securities will not contain any provisions which may afford holders of the debt securities protection in the event we have a change in control or in the event of a highly leveraged transaction (whether or not such transaction results in a change in control) which could adversely affect holders of debt securities.

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### **Consolidation, Merger and Sale of Assets**

We may not consolidate with or merge with or into, or convey, transfer or lease all or substantially all of our properties and assets to any person (a “successor person”) unless:

- we are the surviving corporation or the successor person (if other than Lyra) is a corporation organized and validly existing under the laws of any U.S. domestic jurisdiction and expressly assumes our obligations on the debt securities and under the indenture; and
- immediately after giving effect to the transaction, no Default or Event of Default, shall have occurred and be continuing.

Notwithstanding the above, any of our subsidiaries may consolidate with, merge into or transfer all or part of its properties to us. (Section 5.1)

### **Events of Default**

“Event of Default” means with respect to any series of debt securities, any of the following:

- default in the payment of any interest upon any debt security of that series when it becomes due and payable, and continuance of such default for a period of 30 days (unless the entire amount of the payment is deposited by us with the trustee or with a paying agent prior to the expiration of the 30-day period);
- default in the payment of principal of any security of that series at its maturity;
- default in the performance or breach of any other covenant or warranty by us in the indenture (other than a covenant or warranty that has been included in the indenture solely for the benefit of a series of debt securities other than that series), which default continues uncured for a period of 60 days after we receive written notice from the trustee or Lyra and the trustee receive written notice from the holders of not less than 25% in principal amount of the outstanding debt securities of that series as provided in the indenture;
- certain voluntary or involuntary events of bankruptcy, insolvency or reorganization of Lyra;
- any other Event of Default provided with respect to debt securities of that series that is described in the applicable prospectus supplement. (Section 6.1)

No Event of Default with respect to a particular series of debt securities (except as to certain events of bankruptcy, insolvency or reorganization) necessarily constitutes an Event of Default with respect to any other series of debt securities. (Section 6.1) The occurrence of certain Events of Default or an acceleration under the indenture may constitute an event of default under certain indebtedness of ours or our subsidiaries outstanding from time to time.

We will provide the trustee written notice of any Default or Event of Default within 30 days of becoming aware of the occurrence of such Default or Event of Default, which notice will describe in reasonable detail the status of such Default or Event of Default and what action we are taking or propose to take in respect thereof. (Section 6.1)

If an Event of Default with respect to debt securities of any series at the time outstanding occurs and is continuing, then the trustee or the holders of not less than 25% in principal amount of the outstanding debt securities of that series may, by a notice in writing to us (and to the trustee if given by the holders), declare to be due and payable immediately the principal of (or, if the debt securities of that series are discount securities, that portion of the principal amount as may be specified in the terms of that series) and accrued and unpaid interest, if any, on all debt securities of that series. In the case of an Event of Default resulting from certain events of bankruptcy, insolvency or reorganization, the principal (or such specified amount) of and accrued and unpaid

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interest, if any, on all outstanding debt securities will become and be immediately due and payable without any declaration or other act on the part of the trustee or any holder of outstanding debt securities. At any time after a declaration of acceleration with respect to debt securities of any series has been made, but before a judgment or decree for payment of the money due has been obtained by the trustee, the holders of a majority in principal amount of the outstanding debt securities of that series may rescind and annul the acceleration if all Events of Default, other than the non-payment of accelerated principal and interest, if any, with respect to debt securities of that series, have been cured or waived as provided in the indenture. (Section 6.2) We refer you to the prospectus supplement relating to any series of debt securities that are discount securities for the particular provisions relating to acceleration of a portion of the principal amount of such discount securities upon the occurrence of an Event of Default.

The indenture provides that the trustee may refuse to perform any duty or exercise any of its rights or powers under the indenture unless the trustee receives indemnity satisfactory to it against any cost, liability or expense which might be incurred by it in performing such duty or exercising such right or power. (Section 7.1(e)) Subject to certain rights of the trustee, the holders of a majority in principal amount of the outstanding debt securities of any series will have the right to direct the time, method and place of conducting any proceeding for any remedy available to the trustee or exercising any trust or power conferred on the trustee with respect to the debt securities of that series. (Section 6.12)

No holder of any debt security of any series will have any right to institute any proceeding, judicial or otherwise, with respect to the indenture or for the appointment of a receiver or trustee, or for any remedy under the indenture, unless:

- that holder has previously given to the trustee written notice of a continuing Event of Default with respect to debt securities of that series; and
- the holders of not less than 25% in principal amount of the outstanding debt securities of that series have made written request, and offered indemnity or security satisfactory to the trustee, to the trustee to institute the proceeding as trustee, and the trustee has not received from the holders of not less than a majority in principal amount of the outstanding debt securities of that series a direction inconsistent with that request and has failed to institute the proceeding within 60 days. (Section 6.7)

Notwithstanding any other provision in the indenture, the holder of any debt security will have an absolute and unconditional right to receive payment of the principal of, premium and any interest on that debt security on or after the due dates expressed in that debt security and to institute suit for the enforcement of payment. (Section 6.8)

The indenture requires us, within 120 days after the end of our fiscal year, to furnish to the trustee a statement as to compliance with the indenture. (Section 4.3) If a Default or Event of Default occurs and is continuing with respect to the securities of any series and if it is known to a responsible officer of the trustee, the trustee shall mail to each Securityholder of the securities of that series notice of a Default or Event of Default within 90 days after it occurs or, if later, after a responsible officer of the trustee has knowledge of such Default or Event of Default. The indenture provides that the trustee may withhold notice to the holders of debt securities of any series of any Default or Event of Default (except in payment on any debt securities of that series) with respect to debt securities of that series if the trustee determines in good faith that withholding notice is in the interest of the holders of those debt securities. (Section 7.5)

### **Modification and Waiver**

We and the trustee may modify, amend or supplement the indenture or the debt securities of any series without the consent of any holder of any debt security:

- to cure any ambiguity, defect or inconsistency;

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- to comply with covenants in the indenture described above under the heading “Consolidation, Merger and Sale of Assets”;
- to provide for uncertificated securities in addition to or in place of certificated securities;
- to add guarantees with respect to debt securities of any series or secure debt securities of any series;
- to surrender any of our rights or powers under the indenture;
- to add covenants or events of default for the benefit of the holders of debt securities of any series;
- to comply with the applicable procedures of the applicable depository;
- to make any change that does not adversely affect the rights of any holder of debt securities;
- to provide for the issuance of and establish the form and terms and conditions of debt securities of any series as permitted by the indenture;
- to effect the appointment of a successor trustee with respect to the debt securities of any series and to add to or change any of the provisions of the indenture to provide for or facilitate administration by more than one trustee; or
- to comply with requirements of the SEC in order to effect or maintain the qualification of the indenture under the Trust Indenture Act. (Section 9.1)

We may also modify and amend the indenture with the consent of the holders of at least a majority in principal amount of the outstanding debt securities of each series affected by the modifications or amendments. We may not make any modification or amendment without the consent of the holders of each affected debt security then outstanding if that amendment will:

- reduce the amount of debt securities whose holders must consent to an amendment, supplement or waiver;
- reduce the rate of or extend the time for payment of interest (including default interest) on any debt security;
- reduce the principal of or premium on or change the fixed maturity of any debt security or reduce the amount of, or postpone the date fixed for, the payment of any sinking fund or analogous obligation with respect to any series of debt securities;
- reduce the principal amount of discount securities payable upon acceleration of maturity;
- waive a default in the payment of the principal of, premium or interest on any debt security (except a rescission of acceleration of the debt securities of any series by the holders of at least a majority in aggregate principal amount of the then outstanding debt securities of that series and a waiver of the payment default that resulted from such acceleration);
- make the principal of or premium or interest on any debt security payable in currency other than that stated in the debt security;
- make any change to certain provisions of the indenture relating to, among other things, the right of holders of debt securities to receive payment of the principal of, premium and interest on those debt securities and to institute suit for the enforcement of any such payment and to waivers or amendments; or
- waive a redemption payment with respect to any debt security. (Section 9.3)

Except for certain specified provisions, the holders of at least a majority in principal amount of the outstanding debt securities of any series may on behalf of the holders of all debt securities of that series waive our compliance with provisions of the indenture. (Section 9.2) The holders of a majority in principal amount of

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the outstanding debt securities of any series may on behalf of the holders of all the debt securities of such series waive any past default under the indenture with respect to that series and its consequences, except a default in the payment of the principal of, premium or any interest on any debt security of that series; provided, however, that the holders of a majority in principal amount of the outstanding debt securities of any series may rescind an acceleration and its consequences, including any related payment default that resulted from the acceleration. (Section 6.13)

### **Defeasance of Debt Securities and Certain Covenants in Certain Circumstances**

*Legal Defeasance.* The indenture provides that, unless otherwise provided by the terms of the applicable series of debt securities, we may be discharged from any and all obligations in respect of the debt securities of any series (subject to certain exceptions). We will be so discharged upon the irrevocable deposit with the trustee, in trust, of money and/or U.S. government obligations or, in the case of debt securities denominated in a single currency other than U.S. Dollars, government obligations of the government that issued or caused to be issued such currency, that, through the payment of interest and principal in accordance with their terms, will provide money or U.S. government obligations in an amount sufficient in the opinion of a nationally recognized firm of independent public accountants or investment bank to pay and discharge each installment of principal, premium and interest on and any mandatory sinking fund payments in respect of the debt securities of that series on the stated maturity of those payments in accordance with the terms of the indenture and those debt securities.

This discharge may occur only if, among other things, we have delivered to the trustee an opinion of counsel stating that we have received from, or there has been published by, the United States Internal Revenue Service a ruling or, since the date of execution of the indenture, there has been a change in the applicable United States federal income tax law, in either case to the effect that, and based thereon such opinion shall confirm that, the holders of the debt securities of that series will not recognize income, gain or loss for United States federal income tax purposes as a result of the deposit, defeasance and discharge and will be subject to United States federal income tax on the same amounts and in the same manner and at the same times as would have been the case if the deposit, defeasance and discharge had not occurred. (Section 8.3)

*Defeasance of Certain Covenants.* The indenture provides that, unless otherwise provided by the terms of the applicable series of debt securities, upon compliance with certain conditions:

- we may omit to comply with the covenant described under the heading “Consolidation, Merger and Sale of Assets” and certain other covenants set forth in the indenture, as well as any additional covenants which may be set forth in the applicable prospectus supplement; and
- any omission to comply with those covenants will not constitute a Default or an Event of Default with respect to the debt securities of that series (“covenant defeasance”).

The conditions include:

- depositing with the trustee money and/or U.S. government obligations or, in the case of debt securities denominated in a single currency other than U.S. Dollars, government obligations of the government that issued or caused to be issued such currency, that, through the payment of interest and principal in accordance with their terms, will provide money in an amount sufficient in the opinion of a nationally recognized firm of independent public accountants or investment bank to pay and discharge each installment of principal of, premium and interest on and any mandatory sinking fund payments in respect of the debt securities of that series on the stated maturity of those payments in accordance with the terms of the indenture and those debt securities; and
- delivering to the trustee an opinion of counsel to the effect that the holders of the debt securities of that series will not recognize income, gain or loss for United States federal income tax purposes as a result of the deposit and related covenant defeasance and will be subject to United States federal income tax on the same amounts and in the same manner and at the same times as would have been the case if the deposit and related covenant defeasance had not occurred. (Section 8.4)

**No Personal Liability of Directors, Officers, Employees or Securityholders**

None of our past, present or future directors, officers, employees or securityholders, as such, will have any liability for any of our obligations under the debt securities or the indenture or for any claim based on, or in respect or by reason of, such obligations or their creation. By accepting a debt security, each holder waives and releases all such liability. This waiver and release is part of the consideration for the issue of the debt securities. However, this waiver and release may not be effective to waive liabilities under U.S. federal securities laws, and it is the view of the SEC that such a waiver is against public policy.

**Governing Law**

The indenture and the debt securities, including any claim or controversy arising out of or relating to the indenture or the securities, will be governed by the laws of the State of New York.

The indenture will provide that we, the trustee and the holders of the debt securities (by their acceptance of the debt securities) irrevocably waive, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to the indenture, the debt securities or the transactions contemplated thereby.

The indenture will provide that any legal suit, action or proceeding arising out of or based upon the indenture or the transactions contemplated thereby may be instituted in the federal courts of the United States of America located in the City of New York or the courts of the State of New York in each case located in the City of New York, and we, the trustee and the holder of the debt securities (by their acceptance of the debt securities) irrevocably submit to the non-exclusive jurisdiction of such courts in any such suit, action or proceeding. The indenture will further provide that service of any process, summons, notice or document by mail (to the extent allowed under any applicable statute or rule of court) to such party's address set forth in the indenture will be effective service of process for any suit, action or other proceeding brought in any such court. The indenture will further provide that we, the trustee and the holders of the debt securities (by their acceptance of the debt securities) irrevocably and unconditionally waive any objection to the laying of venue of any suit, action or other proceeding in the courts specified above and irrevocably and unconditionally waive and agree not to plead or claim any such suit, action or other proceeding has been brought in an inconvenient forum. (Section 10.10)

## DESCRIPTION OF WARRANTS

We may issue warrants for the purchase of shares of our common stock or preferred stock or of debt securities. We may issue warrants independently or together with other securities, and the warrants may be attached to or separate from any offered securities. Each series of warrants will be issued under a separate warrant agreement to be entered into between us and the investors or a warrant agent. The following summary of material provisions of the warrants and warrant agreements are subject to, and qualified in their entirety by reference to, all the provisions of the warrant agreement and warrant certificate applicable to a particular series of warrants. The terms of any warrants offered under a prospectus supplement may differ from the terms described below. We urge you to read the applicable prospectus supplement and any related free writing prospectus, as well as the complete warrant agreements and warrant certificates that contain the terms of the warrants.

The particular terms of any issue of warrants will be described in the prospectus supplement relating to the issue. Those terms may include:

- the number of shares of common stock or preferred stock purchasable upon the exercise of warrants to purchase such shares and the price at which such number of shares may be purchased upon such exercise;
- the designation, stated value and terms (including, without limitation, liquidation, dividend, conversion and voting rights) of the series of preferred stock purchasable upon exercise of warrants to purchase preferred stock;
- the principal amount of debt securities that may be purchased upon exercise of a debt warrant and the exercise price for the warrants, which may be payable in cash, securities or other property;
- the date, if any, on and after which the warrants and the related debt securities, preferred stock or common stock will be separately transferable;
- the terms of any rights to redeem or call the warrants;
- the date on which the right to exercise the warrants will commence and the date on which the right will expire;
- United States federal income tax consequences applicable to the warrants; and
- any additional terms of the warrants, including terms, procedures, and limitations relating to the exchange, exercise and settlement of the warrants.

Holders of equity warrants will not be entitled:

- to vote, consent or receive dividends;
- receive notice as shareholders with respect to any meeting of shareholders for the election of our directors or any other matter; or
- exercise any rights as shareholders of Lyra.

Each warrant will entitle its holder to purchase the principal amount of debt securities or the number of shares of preferred stock or common stock at the exercise price set forth in, or calculable as set forth in, the applicable prospectus supplement. Unless we otherwise specify in the applicable prospectus supplement, holders of the warrants may exercise the warrants at any time up to the specified time on the expiration date that we set forth in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void.

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A holder of warrant certificates may exchange them for new warrant certificates of different denominations, present them for registration of transfer and exercise them at the corporate trust office of the warrant agent or any other office indicated in the applicable prospectus supplement. Until any warrants to purchase debt securities are exercised, the holder of the warrants will not have any rights of holders of the debt securities that can be purchased upon exercise, including any rights to receive payments of principal, premium or interest on the underlying debt securities or to enforce covenants in the applicable indenture. Until any warrants to purchase common stock or preferred stock are exercised, the holders of the warrants will not have any rights of holders of the underlying common stock or preferred stock, including any rights to receive dividends or payments upon any liquidation, dissolution or winding up on the common stock or preferred stock, if any.

## DESCRIPTION OF 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.

## GLOBAL SECURITIES

### Book-Entry, Delivery and Form

Unless we indicate differently in any applicable prospectus supplement or free writing prospectus, the securities initially will be issued in book-entry form and represented by one or more global notes or global securities, or, collectively, global securities. The global securities will be deposited with, or on behalf of, The Depository Trust Company, New York, New York, as depository, or DTC, and registered in the name of Cede & Co., the nominee of DTC. Unless and until it is exchanged for individual certificates evidencing securities under the limited circumstances described below, a global security may not be transferred except as a whole by the depository to its nominee or by the nominee to the depository, or by the depository or its nominee to a successor depository or to a nominee of the successor depository.

DTC has advised us that it is:

- a limited-purpose trust company organized under the New York Banking Law;
- a “banking organization” within the meaning of the New York Banking Law;
- a member of the Federal Reserve System;
- a “clearing corporation” within the meaning of the New York Uniform Commercial Code; and
- a “clearing agency” registered pursuant to the provisions of Section 17A of the Exchange Act.

DTC holds securities that its participants deposit with DTC. DTC also facilitates the settlement among its participants of securities transactions, such as transfers and pledges, in deposited securities through electronic computerized book-entry changes in participants’ accounts, thereby eliminating the need for physical movement of securities certificates. “Direct participants” in DTC include securities brokers and dealers, including underwriters, banks, trust companies, clearing corporations and other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation, or DTCC. DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others, which we sometimes refer to as indirect participants, that clear through or maintain a custodial relationship with a direct participant, either directly or indirectly. The rules applicable to DTC and its participants are on file with the SEC.

Purchases of securities under the DTC system must be made by or through direct participants, which will receive a credit for the securities on DTC’s records. The ownership interest of the actual purchaser of a security, which we sometimes refer to as a beneficial owner, is in turn recorded on the direct and indirect participants’ records. Beneficial owners of securities will not receive written confirmation from DTC of their purchases. However, beneficial owners are expected to receive written confirmations providing details of their transactions, as well as periodic statements of their holdings, from the direct or indirect participants through which they purchased securities. Transfers of ownership interests in global securities are to be accomplished by entries made on the books of participants acting on behalf of beneficial owners. Beneficial owners will not receive certificates representing their ownership interests in the global securities, except under the limited circumstances described below.

To facilitate subsequent transfers, all global securities deposited by direct participants with DTC will be registered in the name of DTC’s partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of securities with DTC and their registration in the name of Cede & Co. or such other nominee will not change the beneficial ownership of the securities. DTC has no knowledge of the actual beneficial owners of the securities. DTC’s records reflect only the identity of the direct participants to whose accounts the securities are credited, which may or may not be the beneficial owners. The participants are responsible for keeping account of their holdings on behalf of their customers.

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So long as the securities are in book-entry form, you will receive payments and may transfer securities only through the facilities of the depositary and its direct and indirect participants. We will maintain an office or agency in the location specified in the prospectus supplement for the applicable securities, where notices and demands in respect of the securities and the indenture may be delivered to us and where certificated securities may be surrendered for payment, registration of transfer or exchange.

Conveyance of notices and other communications by DTC to direct participants, by direct participants to indirect participants and by direct participants and indirect participants to beneficial owners will be governed by arrangements among them, subject to any legal requirements in effect from time to time.

Redemption notices will be sent to DTC. If less than all of the securities of a particular series are being redeemed, DTC's practice is to determine by lot the amount of the interest of each direct participant in the securities of such series to be redeemed.

Neither DTC nor Cede & Co. (or such other DTC nominee) will consent or vote with respect to the securities. Under its usual procedures, DTC will mail an omnibus proxy to us as soon as possible after the record date. The omnibus proxy assigns the consenting or voting rights of Cede & Co. to those direct participants to whose accounts the securities of such series are credited on the record date, identified in a listing attached to the omnibus proxy.

So long as securities are in book-entry form, we will make payments on those securities to the depositary or its nominee, as the registered owner of such securities, by wire transfer of immediately available funds. If securities are issued in definitive certificated form under the limited circumstances described below and unless if otherwise provided in the description of the applicable securities herein or in the applicable prospectus supplement, we will have the option of making payments by check mailed to the addresses of the persons entitled to payment or by wire transfer to bank accounts in the United States designated in writing to the applicable trustee or other designated party at least 15 days before the applicable payment date by the persons entitled to payment, unless a shorter period is satisfactory to the applicable trustee or other designated party.

Redemption proceeds, distributions and dividend payments on the securities will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit direct participants' accounts upon DTC's receipt of funds and corresponding detail information from us on the payment date in accordance with their respective holdings shown on DTC records. Payments by participants to beneficial owners will be governed by standing instructions and customary practices, as is the case with securities held for the account of customers in bearer form or registered in "street name." Those payments will be the responsibility of participants and not of DTC or us, subject to any statutory or regulatory requirements in effect from time to time. Payment of redemption proceeds, distributions and dividend payments to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC, is our responsibility, disbursement of payments to direct participants is the responsibility of DTC, and disbursement of payments to the beneficial owners is the responsibility of direct and indirect participants.

Except under the limited circumstances described below, purchasers of securities will not be entitled to have securities registered in their names and will not receive physical delivery of securities. Accordingly, each beneficial owner must rely on the procedures of DTC and its participants to exercise any rights under the securities and the indenture.

The laws of some jurisdictions may require that some purchasers of securities take physical delivery of securities in definitive form. Those laws may impair the ability to transfer or pledge beneficial interests in securities.

DTC may discontinue providing its services as securities depositary with respect to the securities at any time by giving reasonable notice to us. Under such circumstances, in the event that a successor depositary is not obtained, securities certificates are required to be printed and delivered.

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As noted above, beneficial owners of a particular series of securities generally will not receive certificates representing their ownership interests in those securities. However, if:

- DTC notifies us that it is unwilling or unable to continue as a depository for the global security or securities representing such series of securities or if DTC ceases to be a clearing agency registered under the Exchange Act at a time when it is required to be registered and a successor depository is not appointed within 90 days of the notification to us or of our becoming aware of DTC's ceasing to be so registered, as the case may be;
- we determine, in our sole discretion, not to have such securities represented by one or more global securities; or
- an Event of Default has occurred and is continuing with respect to such series of securities,

we will prepare and deliver certificates for such securities in exchange for beneficial interests in the global securities. Any beneficial interest in a global security that is exchangeable under the circumstances described in the preceding sentence will be exchangeable for securities in definitive certificated form registered in the names that the depository directs. It is expected that these directions will be based upon directions received by the depository from its participants with respect to ownership of beneficial interests in the global securities.

### ***Euroclear and Clearstream***

If so provided in the applicable prospectus supplement, you may hold interests in a global security through Clearstream Banking S.A., which we refer to as "Clearstream," or Euroclear Bank S.A./N.V., as operator of the Euroclear System, which we refer to as "Euroclear," either directly if you are a participant in Clearstream or Euroclear or indirectly through organizations which are participants in Clearstream or Euroclear. Clearstream and Euroclear will hold interests on behalf of their respective participants through customers' securities accounts in the names of Clearstream and Euroclear, respectively, on the books of their respective U.S. depositories, which in turn will hold such interests in customers' securities accounts in such depositories' names on DTC's books.

Clearstream and Euroclear are securities clearance systems in Europe. Clearstream and Euroclear hold securities for their respective participating organizations and facilitate the clearance and settlement of securities transactions between those participants through electronic book-entry changes in their accounts, thereby eliminating the need for physical movement of certificates.

Payments, deliveries, transfers, exchanges, notices and other matters relating to beneficial interests in global securities owned through Euroclear or Clearstream must comply with the rules and procedures of those systems. Transactions between participants in Euroclear or Clearstream, on one hand, and other participants in DTC, on the other hand, are also subject to DTC's rules and procedures.

Investors will be able to make and receive through Euroclear and Clearstream payments, deliveries, transfers and other transactions involving any beneficial interests in global securities held through those systems only on days when those systems are open for business. Those systems may not be open for business on days when banks, brokers and other institutions are open for business in the United States.

Cross-market transfers between participants in DTC, on the one hand, and participants in Euroclear or Clearstream, on the other hand, will be effected through DTC in accordance with the DTC's rules on behalf of Euroclear or Clearstream, as the case may be, by their respective U.S. depositories; however, such cross-market transactions will require delivery of instructions to Euroclear or Clearstream, as the case may be, by the counterparty in such system in accordance with the rules and procedures and within the established deadlines (European time) of such system. Euroclear or Clearstream, as the case may be, will, if the transaction meets its settlement requirements, deliver instructions to its U.S. depository to take action to effect final settlement on its behalf by delivering or receiving interests in the global securities through DTC, and making or receiving payment in accordance with normal procedures for same-day fund settlement. Participants in Euroclear or Clearstream may not deliver instructions directly to their respective U.S. depositories.

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Due to time zone differences, the securities accounts of a participant in Euroclear or Clearstream purchasing an interest in a global security from a direct participant in DTC will be credited, and any such crediting will be reported to the relevant participant in Euroclear or Clearstream, during the securities settlement processing day (which must be a business day for Euroclear or Clearstream) immediately following the settlement date of DTC. Cash received in Euroclear or Clearstream as a result of sales of interests in a global security by or through a participant in Euroclear or Clearstream to a direct participant in DTC will be received with value on the settlement date of DTC but will be available in the relevant Euroclear or Clearstream cash account only as of the business day for Euroclear or Clearstream following DTC's settlement date.

### ***Other***

The information in this section of this prospectus concerning DTC, Clearstream, Euroclear and their respective book-entry systems has been obtained from sources that we believe to be reliable, but we do not take responsibility for this information. This information has been provided solely as a matter of convenience. The rules and procedures of DTC, Clearstream and Euroclear are solely within the control of those organizations and could change at any time. Neither we nor the trustee nor any agent of ours or of the trustee has any control over those entities and none of us takes any responsibility for their activities. You are urged to contact DTC, Clearstream and Euroclear or their respective participants directly to discuss those matters. In addition, although we expect that DTC, Clearstream and Euroclear will perform the foregoing procedures, none of them is under any obligation to perform or continue to perform such procedures and such procedures may be discontinued at any time. Neither we nor any agent of ours will have any responsibility for the performance or nonperformance by DTC, Clearstream and Euroclear or their respective participants of these or any other rules or procedures governing their respective operations.

## 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 or through underwriters or dealers, through agents and/or directly to one or more purchasers. The securities may be distributed 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.

Each time that we sell securities covered by this prospectus, we will provide a prospectus supplement or supplements that will describe the method of distribution and set forth the terms and conditions of the offering of such securities, including the offering price of the securities and the proceeds to us, if applicable.

Offers to purchase the securities being offered by this prospectus may be solicited directly. Agents may also be designated to solicit offers to purchase the securities from time to time. Any agent involved in the offer or sale of our securities will be identified in a prospectus supplement.

If a dealer is utilized in the sale of the securities being offered by this prospectus, the securities will be sold to the dealer, as principal. The dealer may then resell the securities to the public at varying prices to be determined by the dealer at the time of resale.

If an underwriter is utilized in the sale of the securities being offered by this prospectus, an underwriting agreement will be executed with the underwriter at the time of sale and the name of any underwriter will be provided in the prospectus supplement that the underwriter will use to make resales of the securities to the public. In connection with the sale of the securities, we or the purchasers of securities for whom the underwriter may act as agent, may compensate the underwriter in the form of underwriting discounts or commissions. The underwriter may sell the securities to or through dealers, and those dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters and/or commissions from the purchasers for which they may act as agent. Unless otherwise indicated in a prospectus supplement, an agent will be acting on a best efforts basis and a dealer will purchase securities as a principal, and may then resell the securities at varying prices to be determined by the dealer.

Any compensation paid to underwriters, dealers or agents in connection with the offering of the securities, and any discounts, concessions or commissions allowed by underwriters to participating dealers will be provided in the applicable prospectus supplement. Underwriters, dealers and agents participating in the distribution of the securities may be deemed to be underwriters within the meaning of the Securities Act of 1933, as amended, and any discounts and commissions received by them and any profit realized by them on resale of the securities may be deemed to be underwriting discounts and commissions. We may enter into agreements to indemnify underwriters, dealers and agents against civil liabilities, including liabilities under the Securities Act, or to contribute to payments they may be required to make in respect thereof and to reimburse those persons for certain expenses.

Any common stock will be listed on the Nasdaq Capital Market, but any other securities may or may not be listed on a national securities exchange. To facilitate the offering of securities, certain persons participating in the offering may engage in transactions that stabilize, maintain or otherwise affect the price of the securities. This may include over-allotments or short sales of the securities, which involve the sale by persons participating in the offering of more securities than were sold to them. In these circumstances, these persons would cover such over-allotments or short positions by making purchases in the open market or by exercising their over-allotment

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option, if any. In addition, these persons may stabilize or maintain the price of the securities by bidding for or purchasing securities in the open market or by imposing penalty bids, whereby selling concessions allowed to dealers participating in the offering may be reclaimed if securities sold by them are repurchased in connection with stabilization transactions. The effect of these transactions may be to stabilize or maintain the market price of the securities at a level above that which might otherwise prevail in the open market. These transactions may be discontinued at any time.

We may engage in “at the market” offerings into an existing trading market in accordance with Rule 415(a)(4) under the Securities Act. In addition, we may enter into derivative transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement so indicates, in connection with those derivatives, the third parties may sell securities covered by this prospectus and the applicable prospectus supplement, including in short sale transactions. If so, the third party may use securities pledged by us or borrowed from us or others to settle those sales or to close out any related open borrowings of stock, and may use securities received from us in settlement of those derivatives to close out any related open borrowings of stock. The third party in such sale transactions will be an underwriter and, if not identified in this prospectus, will be named in the applicable prospectus supplement (or a post-effective amendment). In addition, we may otherwise loan or pledge securities to a financial institution or other third party that in turn may sell the securities short using this prospectus and an applicable prospectus supplement. Such financial institution or other third party may transfer its economic short position to investors in our securities or in connection with a concurrent offering of other securities.

The specific terms of any lock-up provisions in respect of any given offering will be described in the applicable prospectus supplement.

The underwriters, dealers and agents may engage in transactions with us, or perform services for us, in the ordinary course of business for which they receive compensation.

## **LEGAL MATTERS**

Latham & Watkins LLP will pass upon certain legal matters relating to the issuance and sale of the securities offered hereby on behalf of Lyra Therapeutics, Inc. 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 consolidated financial statements of Lyra Therapeutics, Inc. (the “Company”) as of December 31, 2023 and 2022 and for each of the two years in the period ended December 31, 2023 incorporated by reference in this Prospectus and in the Registration Statement have been so incorporated in reliance on the report of BDO USA, P.C., an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting. The report on the consolidated financial statements contains an explanatory paragraph regarding the Company’s ability to continue as a going concern.

**273,012 Shares of Common Stock**

**Pre-Funded Warrants to Purchase up to 150,360 Shares of Common Stock**



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**Prospectus Supplement**

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**H.C. Wainwright & Co.**

June 26, 2025

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