

As filed with the Securities and Exchange Commission on July 26, 2024

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

PHIO PHARMACEUTICALS CORP.

(Exact name of Registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

2834
(Primary Standard Industrial
Classification Code Number)

45-3215903
(I.R.S. Employer
Identification Number)

**11 Apex Drive, Suite 300A, PMB 2006
Marlborough, Massachusetts 01752
(508) 767-3861**

(Address, including zip code, and telephone number, including area code, of Registrant's principal executive offices)

**Robert J. Bitterman
President & CEO
Phio Pharmaceuticals Corp.
11 Apex Drive, Suite 300A, PMB 2006
Marlborough, Massachusetts 01752
(508) 767-3861**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

**Steven J. Abrams, Esq.
Hogan Lovells US LLP
1735 Market Street, Suite 2300
Philadelphia, Pennsylvania 19103
(267) 675-4600**

Approximate date of commencement of proposed sale to the public:

From time to time after the effective date of this Registration Statement.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box. ☒

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

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

Large accelerated filer ☐
Non-accelerated filer ☒

Accelerated filer ☐
Smaller reporting company ☒
Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

The information in this preliminary prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities, and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to completion, dated July 26, 2024



Up to 1,131,468 Shares of Common Stock

Pursuant to this prospectus, the selling stockholders identified herein (the "**Selling Stockholders**") are offering on a resale basis an aggregate of up to 1,131,468 shares of common stock of Phio Pharmaceuticals Corp. (the "**Company**," "**we**," "**us**" or "**our**"), par value \$0.0001 per share (the "**Common Stock**") consisting of (a) up to an aggregate of 583,098 shares of Common Stock that are issuable upon exercise of warrants with a five and one-half year term ("**Series C Warrants**"), (b) up to an aggregate of 507,474 shares of Common Stock that are issuable upon exercise of warrants with an eighteen month term (the "**Series D Warrants**"), in each case issued pursuant to inducement letter agreements by and among us and the Selling Stockholders, dated July 11, 2024 (the "**Inducement Letter Agreements**"), and (c) up to 40,896 shares of Common Stock that are issuable upon the exercise of certain warrants (together with the Series C Warrants and the Series D Warrants, the "**Warrants**") issued to our placement agent pursuant to an engagement letter in connection with the Inducement Letter Agreements and the offering contemplated thereunder.

We will not receive any of the proceeds from the sale by the Selling Stockholders of the Common Stock. Upon any exercise of the Warrants by payment of cash, however, we will receive the exercise price of the Warrants, which, if exercised in cash with respect to the 1,131,468 shares of Common Stock offered hereby, would result in gross proceeds to us of approximately \$6.2 million. However, we cannot predict when and in what amounts or if the Warrants will be exercised by payments of cash and it is possible that the Warrants may expire and never be exercised, in which case we would not receive any cash proceeds.

The Selling Stockholders may sell or otherwise dispose of the Common Stock covered by this prospectus in a number of different ways and at varying prices. We provide more information about how the Selling Stockholders may sell or otherwise dispose of the Common Stock covered by this prospectus in the section entitled "[Plan of Distribution](#)" on page 11. Discounts, concessions, commissions and similar selling expenses attributable to the sale of Common Stock covered by this prospectus will be borne by the Selling Stockholders. We will pay all expenses (other than discounts, concessions, commissions and similar selling expenses) relating to the registration of the Common Stock with the Securities and Exchange Commission (the "**SEC**").

Our Common Stock is listed on The Nasdaq Capital Market under the symbol "PHIO." On July 25, 2024, the last reported sale price of our Common Stock on The Nasdaq Capital Market was \$3.8467 per share.

Investing in our securities involves a high degree of risk. Before making any investment in these securities, you should consider carefully the risks and uncertainties described in the section entitled "[Risk Factors](#)" beginning on page 6 of this prospectus.

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

The date of this prospectus is , 2024

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ABOUT THIS PROSPECTUS

This prospectus relates to the resale by the Selling Stockholders identified in this prospectus under the caption “ [Selling Stockholders](#),” from time to time, of up to an aggregate of 1,131,468 shares of Common Stock. We are not selling any shares of Common Stock under this prospectus, and we will not receive any proceeds from the sale of shares of Common Stock offered hereby by the Selling Stockholders, although we may receive cash from the exercise of the Warrants.

You should rely only on the information provided in this prospectus, including any information incorporated by reference. We have not authorized anyone to provide you with any other information and we take no responsibility for, and can provide no assurances as to the reliability of, any other information that others may give you. The information contained in this prospectus speaks only as of the date set forth on the cover page and may not reflect subsequent changes in our business, financial condition, results of operations and prospects.

We are not, and the Selling Stockholders are not, making offers to sell these securities in any jurisdiction in which an offer or solicitation is not authorized or permitted or in which the person making such offer or solicitation is not qualified to do so or to any person to whom it is unlawful to make such an offer or solicitation. You should read this prospectus, including any information incorporated by reference, in its entirety before making an investment decision. You should also read and consider the information in the documents to which we have referred you in the sections entitled “ [Where You Can Find More Information](#)” and “ [Incorporation of Certain Information by Reference](#).”

In this prospectus, unless otherwise noted, (1) the term “Phio” refers to Phio Pharmaceuticals Corp. and our subsidiary, MirlImmune, LLC and (2) the terms “Company,” “we,” “us” and “our” refer to the ongoing business operations of Phio and MirlImmune, LLC, whether conducted through Phio or MirlImmune, LLC.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements can be identified by words such as “intends,” “believes,” “anticipates,” “indicates,” “plans,” “expects,” “suggests,” “may,” “would,” “should,” “potential,” “designed to,” “will,” “ongoing,” “estimate,” “forecast,” “target,” “predict,” “could,” and similar references, although not all forward-looking statements contain these words. Forward-looking statements are neither historical facts nor assurances of future performance. These statements are based only on our current beliefs, expectations and assumptions regarding the future of our business, future plans and strategies, projections, anticipated events and trends, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict and many of which are outside of our control. Risks that could cause actual results to vary from expected results expressed in our forward-looking statements include, but are not limited to:

- we are dependent on the success of our INTASYL™ technology platform, and our product candidates based on this platform, which is unproven and may never lead to approved and marketable products;
- our product candidates are in an early stage of development and we may fail, experience significant delays, never advance in clinical development or not be successful in our efforts to identify or discover additional product candidates, which may materially and adversely impact our business;
- if we experience delays or difficulties in identifying and enrolling subjects in clinical trials, it may lead to delays in generating clinical data and the receipt of necessary regulatory approvals;
- topline data may not accurately reflect or may materially differ from the complete results of a clinical trial;
- we rely upon third parties for the manufacture of the clinical supply for our product candidates;
- our business and operations would suffer in the event of computer system failures, cyberattacks or a deficiency in our cybersecurity;
- we are dependent on the patents we own and the technologies we license, and if we fail to maintain our patents or lose the right to license such technologies, our ability to develop new products would be harmed;
- we will require substantial additional funds to complete our research and development activities;
- future financing may be obtained through, and future development efforts may be paid for by, the issuance of debt or equity, which may have an adverse effect on our stockholders or may otherwise adversely affect our business;
- we may not be able to maintain compliance with the continued listing requirements of The Nasdaq Capital Market; and
- the price of our common stock has been and may continue to be volatile.

The risks set forth above are not exhaustive and additional factors, including those identified in this prospectus under the heading “Risk Factors,” for reasons described elsewhere in this prospectus and in other filings Phio Pharmaceuticals Corp. periodically makes with the Securities and Exchange Commission, including the other risks identified in Item 1A. Risk Factors in our Annual Report on Form 10-K for the year ended December 31, 2023, could adversely affect our business and financial performance. Therefore, you should not rely unduly on any of these forward-looking statements. Forward-looking statements contained in this prospectus speak as of the date hereof and Phio Pharmaceuticals Corp. does not undertake to update any of these forward-looking statements to reflect a change in its views or events or circumstances that occur after the date of this report, except as required

PROSPECTUS SUMMARY

The following summary highlights certain information contained elsewhere in this prospectus and the documents incorporated by reference herein. This summary provides an overview of selected information and does not contain all of the information you should consider in making your investment decision. Therefore, you should read the entire prospectus and the documents incorporated by reference herein carefully before investing in our securities. Investors should carefully consider the information set forth under ["Risk Factors"](#) beginning on page 6 of this prospectus and the financial statements and other information incorporated by reference in this prospectus.

Overview

Phio is a clinical stage biotechnology company whose proprietary INTASYL® small interfering RNA gene silencing technology is designed to make immune cells more effective in killing tumor cells. We are developing therapeutics that are designed to leverage INTASYL to precisely target specific proteins that reduce the body's ability to fight cancer, without the need for specialized formulations or drug delivery systems.

In 2023, we implemented a cost rationalization program driven by our transition from a discovery research company to a product development company. This transition resulted in a decision not to renew the lease for our corporate headquarters and primary research facility in Marlborough, Massachusetts, which expired on March 31, 2024. As of April 1, 2024, we have continued operations primarily as a remote business with a laboratory facility in Worcester, Massachusetts. Additionally, we rationalized research personnel and reduced our headcount by approximately 36%. These expense reductions have been redirected to funding the Phase 1b clinical trial with PH-762 directed toward skin cancer.

INTASYL Platform

Overall, RNA is involved in the synthesis, regulation and expression of proteins. RNA takes the instructions from DNA and turns those instructions into proteins within the body's cells. RNA interference, or RNAi, is a biological process that inhibits the expression of genes or the production of proteins. Diseases are often related to the incorrect protein being made, excessive amounts of a specific protein being made, or the correct protein being made, but at the wrong location or time. RNAi offers a novel approach to drug development because RNAi compounds can be designed to silence any one of the thousands of human genes, many of which are considered "undruggable" by traditional therapeutics.

Our development efforts are based on our proprietary INTASYL self-delivering RNAi technology platform. It is a patented platform from which specific patented compounds are developed. INTASYL compounds are comprised of a unique sequence of chemically modified nucleotides (modified small interfering RNA, or siRNAs) that target a broad range of cell types and tissues. The compounds are designed to effectively silence genes that tumors use to evade the immune system.

Since the initial discovery of RNAi, drug delivery has been the primary challenge in developing RNAi-based therapeutics. Other siRNA technologies require cell targeting chemical conjugates which limit delivery to specific cell types. INTASYL is based on proprietary chemistry that is designed to maximize the activity and adaptability of the compound and is unique in that it can be delivered to any cell type or tissue without the need to modify the chemistry. This is designed to eliminate the need for formulations or delivery systems (for example, nanoparticles or electroporation). This provides efficient, spontaneous, cellular uptake with potent, long-lasting intracellular activity.

We believe that our INTASYL platform provides the following benefits including, but not limited to:

- Ability to target a broad range of cell types and tissues;
- Ability to target both intracellular and extracellular protein targets;
- Efficient uptake by target cells, avoiding the need for assisted delivery;
- Sustained, or long-term, effect *in vivo*;
- Ability to target multiple genes in one drug product;
- Favorable clinical safety profile with local administration; and
- Readily manufactured under current good manufacturing practices.

Our Pipeline

INTASYL compounds are designed to precisely target specific proteins that reduce the body's ability to fight cancer, without the need for specialized formulations or drug delivery systems, and are designed to make immune cells more effective in killing tumor cells. Our efforts are focused on developing immuno-oncology therapeutics using our INTASYL platform. We have demonstrated preclinical activity against multiple gene targets including PD-1, BRD4, CTLA-4, TIGIT and CTGF and have demonstrated preclinical efficacy in both direct-to-tumor injection and adoptive cell therapy ("ACT") applications with our INTASYL compounds.

PH-762

PH-762 is an INTASYL compound designed to reduce the expression of cell death protein 1 ("PD-1"). PD-1 is a protein that inhibits T cells' ability to kill cancer cells and is a clinically validated target in immunotherapy. Decreasing the expression of PD-1 can thereby increase the capacity of T cells, which protect the body from cancer cells and infections, to kill cancer cells.

Our preclinical studies have demonstrated that direct-to-tumor application of PH-762 resulted in potent anti-tumoral effects and have shown that direct-to-tumor treatment with PH-762 inhibits tumor growth in a dose dependent fashion in PD-1 responsive and refractory models. Importantly, direct-to-tumor administration of PH-762 resulted in activity against distant untreated tumors, indicative of a systemic anti-tumor response. We believe these data further support the potential for PH-762 to provide a strong local immune response without the dose immune-related adverse effects seen with systemic antibody therapy.

PH-762 is currently being evaluated in a U.S. multi-center Phase 1b dose-escalating clinical trial through the intratumoral injection of PH-762 for the treatment of patients with cutaneous squamous cell carcinoma, melanoma and Merkel cell carcinoma. The trial is designed to evaluate the safety and tolerability of neoadjuvant use of intratumorally injected PH-762, assess the tumor response, and determine the dose or dose range for continued study of PH-762 and is expected to enroll up to 30 patients. In November 2023, we announced the dosing of the first patient under a previously cleared Investigational New Drug (“IND”) application by the U.S. Food and Drug Administration. In May 2024, a safety monitoring committee reviewed data from the first dose cohort treated and recommended the escalation to the next dose concentration. The trial is open for the continued enrollment of patients and expects to complete enrollment of patients in the second quarter of 2025.

Due to INTASYL's ease of administration, we have shown that our compounds can easily be incorporated into current ACT manufacturing processes. In ACT, T cells are usually taken from a patient's own blood or tumor tissue, grown in large numbers in a laboratory, and then given back to the patient to help the immune system fight cancer. By treating T cells with our INTASYL compounds while they are being grown in the laboratory, we believe our INTASYL compounds can improve these immune cells to make them more effective in killing cancer. Preclinical data generated in collaboration with AgonOx, Inc. (“**AgonOx**”), a private company developing a pipeline of novel immunotherapy drugs targeting key regulators of the immune response to cancer, demonstrated that treating AgonOx's “double positive” tumor infiltrating lymphocytes (“**DP TIL**”) with PH-762 increased their tumor killing activity by two-fold.

In February 2021, we entered into a clinical co-development collaboration agreement (the “**Clinical Co-Development Agreement**”) with AgonOx to develop a T cell-based therapy using PH-762 and AgonOx's DP TIL. Under the Clinical Co-Development Agreement, Phio and AgonOx were working to develop a T cell-based therapy using the Company's lead product candidate, PH-762, and AgonOx's DP TIL technology. We had agreed to reimburse AgonOx up to \$4 million in expenses incurred to conduct a Phase 1 clinical trial of PH-762 treated DP TIL in patients with advanced melanoma and other advanced solid tumors. We were also eligible to receive certain future development milestones and low single-digit sales-based royalty payments from AgonOx's licensing of its DP TIL technology.

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In May 2024, we terminated the Clinical Co-Development Agreement with AgonOx, which was effective immediately. Effective as of the date of the termination, the Clinical Co-Development Agreement and our continuing obligations and those of AgonOx thereunder were terminated in their entirety. We are no longer required to provide financial support for the development costs incurred under the Clinical Co-Development Agreement or entitled to certain future development milestones and low single-digit sales-based royalty payments from AgonOx's licensing of its DP TIL technology. We will pay to AgonOx all payment obligations that accrued prior to the termination of the Clinical Co-Development Agreement. As of June 30, 2024, remaining payments to be made to AgonOx total \$344,000, which primarily relate to accrued obligations for patient fees and other miscellaneous costs as of the date of termination. Pursuant to the terms of the Clinical Co-Development Agreement, we and AgonOx shall meet and discuss the orderly wind-down of the Phase 1 clinical trial. Each of us and AgonOx shall be responsible for its own costs and expenses incurred in connection with the wind-down of the Phase 1 clinical trial.

Prior to the termination of the Clinical Co-Development Agreement with AgonOx, PH-762 treated DP TIL were being evaluated in a Phase 1 clinical trial in the United States with up to 18 patients with advanced melanoma and other advanced solid tumors by AgonOx. The primary trial objectives were to evaluate the safety and to study the potential for enhanced therapeutic benefit from the administration of PH-762 treated DP TIL. AgonOx had enrolled three patients. The first two patients were treated with DP TIL only and the third patient was treated with a combination of DP TIL and PH-762.

July 2024 Offering

On July 11, 2024, we entered into inducement letter agreements (the “**Inducement Letter Agreements**”) with certain holders (the “**Holders**”) of certain of our existing warrants to purchase up to an aggregate of 545,286 shares of the Company's common stock, \$0.0001 par value (the “**Common Stock**”), originally issued to the Holders in February 2020 through December 2023, having exercise prices between \$324.00 and \$9.72 per share (the “**Existing Warrants**”).

Pursuant to the Inducement Letter Agreements, the Holders agreed to exercise for cash the Existing Warrants at a reduced exercise price of \$5.45 per share in consideration of our agreement to issue new unregistered Series C Warrants (the “**Series C Warrants**”) to purchase up to 583,098 shares of Common Stock and new unregistered Series D Warrants (the “**Series D Warrants**”) and, together with the Series C Warrants, the “**New Warrants**”) to purchase up to 507,474 shares of Common Stock (collectively, the “**New Warrant Shares**”), issued and sold at a price of \$0.125 per New Warrant. The Series C Warrants have an exercise price of \$5.45 per share, were exercisable immediately upon issuance and have a term equal to five and one-half years from the date of issuance. The Series D Warrants have an exercise price of \$5.45 per share, were exercisable immediately upon issuance and have a term equal to eighteen months from the date of issuance.

Pursuant to the terms of the Inducement Letter Agreements, in the event that the exercise of the Existing Warrants would have otherwise caused a Holder to exceed the beneficial ownership limitations set forth in such Holder's Existing Warrants (4.99% or, if applicable and at such Holder's election, 9.99%), we issued to such Holder the number of shares of Common Stock that would not cause such Holder to exceed such beneficial ownership limitation, as directed by such Holder, and agreed to hold such Holder's balance of shares of Common Stock in abeyance until we receive notice from such Holder that the balance of shares of Common Stock may be issued in compliance with such beneficial ownership limitations. Accordingly, an aggregate of 328,758 shares of Common Stock were held in abeyance (the “**Abeyance Shares**”) for such Holders, with such Abeyance Shares evidenced through such Holders' Existing Warrants, which Holders' Existing Warrants shall be deemed prepaid and may be exercised pursuant to a notice of exercise from the applicable Holder.

The net proceeds to us from the exercise of the Existing Warrants are estimated to be approximately \$2.6 million, after deducting placement agent fees and offering expenses. The closing of the offering occurred on July 12, 2024.

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Pursuant to an engagement letter, dated as of June 27, 2024 (the “**Engagement Letter**”), between us and H.C. Wainwright & Co., LLC (“**Wainwright**”), we agreed to pay Wainwright (i) an aggregate cash fee equal to 7.5% of the gross proceeds from the exercise of the Existing Warrants and, if the New Warrants are exercised for cash, upon such exercise, and (ii) a management fee equal to 1.0% of the aggregate gross proceeds from the exercise of the Existing Warrants and, if the New Warrants are exercised for cash, upon such exercise. We also agreed to pay Wainwright \$35,000 for non-accountable expenses, \$50,000 for accountable expenses and \$15,950 for clearing fees. Additionally, we agreed to issue to Wainwright or its designees as compensation, warrants to purchase up to 40,896 shares of Common Stock, equal to 7.5% of the aggregate number of Existing Warrants

exercised in the offering and, if the New Warrants are exercised for cash, further warrants to purchase shares of Common Stock equal to the 7.5% of the aggregate number of New Warrants so exercised (the "**Placement Agent Warrants**") and, together with the Series C Warrants and the Series D Warrants, the "**Warrants**"). The Placement Agent Warrants have or will have a term of five and one half years from the closing of the offering or the exercise of the New Warrants, as applicable, and an exercise price of \$6.8125 per share of Common Stock.

Corporate Information

The Company was incorporated in the state of Delaware in 2011 as RXi Pharmaceuticals Corporation. On November 19, 2018, we changed our name to Phio Pharmaceuticals Corp., to reflect our transition from a platform company to one that is fully committed to developing groundbreaking immuno-oncology therapeutics. Our principal mailing address is 11 Apex Drive, Suite 300A, PMB 2006, Marlborough, Massachusetts 01752, and our telephone number is (508) 767-3861. Our website address is <http://www.phioharma.com>. Our website and the information contained on that site, or connected to that site, is not part of or incorporated by reference into this prospectus.

Effective July 5, 2024, we completed a 1-for-9 reverse stock split of our outstanding Common Stock, including reclassifying an amount equal to the reduction in par value to additional paid-in capital. The reverse stock split did not reduce the number of authorized shares of our Common Stock or preferred stock. All share and per share amounts have been adjusted to give effect to the reverse stock split.

THE OFFERING

The Selling Stockholders identified in this prospectus are offering on a resale basis up to 1,131,468 shares of Common Stock issuable upon exercise of the Warrants, as more fully described above.

Common Stock to be offered by the Selling Stockholders	Up to 1,131,468 shares of Common Stock
Common Stock outstanding prior to this offering	510,188 shares of Common Stock as of March 31, 2024
Common Stock to be outstanding after this offering	1,858,184 ¹ shares of Common Stock
Use of proceeds:	We will not receive any proceeds from the sale of the shares of Common Stock by the Selling Stockholders, except for the Warrant exercise price paid for the Common Stock offered hereby and issuable upon the exercise of the Warrants. See " Use of Proceeds " on page 8 of this prospectus.
Risk factors:	You should read the " Risk Factors " section beginning on page 6 of this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our securities.
Nasdaq Capital Market symbol:	Our Common Stock is listed on The Nasdaq Capital Market under the symbol "PHIO." We do not intend to apply for listing of the Warrants on any securities exchange or nationally recognized trading system.

¹ The number of shares of Common Stock to be outstanding after this offering is based on 510,188 shares of Common Stock outstanding as of March 31, 2024, plus 216,528 shares of our Common Stock issued from the exercise of the Existing Warrants pursuant to the Inducement Letter Agreements. Unless specifically stated otherwise, the information in this prospectus is as of March 31, 2024 and excludes:

- 1,139 shares of Common Stock issuable upon the exercise of stock options outstanding as of March 31, 2024, having a weighted average exercise price of \$7,871.24 per share;
- 2,070 shares of Common Stock issuable upon the vesting of restricted stock units outstanding as of March 31, 2024;
- 66,418 shares of Common Stock issuable upon the exercise of warrants (exclusive of the Existing Warrants) outstanding as of March 31, 2024, having a weighted average exercise price of \$247.46 per share;
- 328,758 Abeyance Shares issuable pursuant to certain Existing Warrants and upon receipt of a notice from any applicable Holder that such Abeyance Shares may be issued in compliance with the beneficial ownership limitations contained in the applicable Holder's Existing Warrants;
- 15,611 shares of Common Stock reserved for future issuance under our 2020 Long-Term Incentive Plan as of March 31, 2024; and
- 73 shares of Common Stock reserved for future issuance under our Employee Stock Purchase Plan as of March 31, 2024.

RISK FACTORS

Investing in our securities involves a high degree of risk. Before investing in our securities, you should carefully consider the risks, uncertainties and assumptions contained in this prospectus and discussed under the heading "Risk Factors" included in our Annual Report on Form 10-K for the year ended December 31, 2023, as revised or supplemented by subsequent filings, which are on file with the SEC and are incorporated herein by reference, and which may be amended, supplemented or superseded from time to time by other reports we file with the SEC in the future. The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Our business, financial condition, results of operations and future growth prospects could be materially and adversely affected by any of these risks. In these circumstances, the market price of our Common Stock could decline, and you may lose all or part of your investment.

SELECTED FINANCIAL DATA REFLECTING REVERSE STOCK SPLIT

Reverse Stock Split

On July 5, 2024, we effected a 1-for-9 reverse stock split of our common stock. Based on such reverse stock split, the total number of outstanding shares of common stock was adjusted from 4,591,700 to approximately 510,188. The par value per common share remained unchanged at \$0.0001. The audited consolidated financial statements of Phio Pharmaceuticals Corp. included in the Annual Report on Form 10-K for the year ended December 31, 2023, and the unaudited condensed consolidated financial statements included in our Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2024, which are incorporated by reference into this prospectus are presented without giving effect to the reverse stock split. Except where the context otherwise requires, share numbers in this prospectus reflect the 1-for-9 reverse stock split of our common stock.

The following selected financial data has been derived from our audited consolidated financial statements included in our Annual Report on Form 10-K filed with the SEC on April 1, 2024, and our unaudited condensed consolidated financial statements included in our Quarterly Report on Form 10-Q filed with the SEC on May 9, 2024, as adjusted to reflect the reverse stock split for all periods presented. Our historical results are not indicative of the results that may be expected in the future and results of interim periods are not indicative of the results for the entire year.

AS REPORTED (in thousands, except share and per share amounts):

	Year Ended December 31,	
	2023	2022
Net loss	\$ (10,826)	\$ (11,480)
Net loss per common share, basic and diluted	\$ (5.20)	\$ (10.10)
Weighted average common shares outstanding, basic and diluted	2,083,569	1,136,566
Common shares outstanding at year end	3,747,329	1,139,024

	Three Months Ended March 31,	
	2024	2023
Net loss	\$ (2,154)	\$ (3,602)
Net loss per common share, basic and diluted	\$ (0.47)	\$ (3.15)
Weighted average common shares outstanding, basic and diluted	4,580,072	1,142,213
Common shares outstanding at period end	4,591,700	1,150,582

AS ADJUSTED FOR 1-FOR-9 REVERSE STOCK SPLIT (unaudited, in thousands, except share and per share amounts):

	Year Ended December 31,	
	2023	2022
Net loss	\$ (10,826)	\$ (11,480)
Net loss per common share, basic and diluted	\$ (46.76)	\$ (90.91)
Weighted average common shares outstanding, basic and diluted	231,507	126,285
Common shares outstanding at year end	416,368	126,558

	Three Months Ended March 31,	
	2024	2023
Net loss	\$ (2,154)	\$ (3,602)
Net loss per common share, basic and diluted	\$ (4.23)	\$ (28.38)
Weighted average common shares outstanding, basic and diluted	508,896	126,912
Common shares outstanding at period end	510,188	127,842

USE OF PROCEEDS

We will not receive any of the proceeds from the sale of the Common Stock by the Selling Stockholders. The shares offered hereby are issuable upon the exercise of the Warrants. Upon exercise of the Warrants for cash, we will receive the applicable cash exercise price paid by the holders of the

Warrants of approximately \$6.2 million (assuming the full exercise of the Warrants).

We intend to use any proceeds received by us from the cash exercise of the Warrants to fund the development of our product candidates, other research and development activities and for general working capital needs. We may also use a portion of any proceeds received by us from the cash exercise of the Warrants to acquire or invest in complementary businesses, products and technologies or to fund the development of any such complementary businesses, products or technologies. We currently have no plans for any such acquisitions.

DIVIDEND POLICY

We have never paid any cash dividends and do not anticipate paying any cash dividends on our Common Stock in the foreseeable future. We expect to retain future earnings, if any, for use in our development activities and the operation of our business. The payment of any future dividends will be subject to the discretion of our Board of Directors and will depend, among other things, upon our results of operations, financial condition, cash requirements, prospects and other factors that our Board of Directors may deem relevant.

DETERMINATION OF OFFERING PRICE

The prices at which the shares of Common Stock covered by this prospectus may actually be sold will be determined by the prevailing public market price for shares of our Common Stock or by negotiations between the Selling Stockholders and buyers of our Common Stock in private transactions or as otherwise described in "Plan of Distribution."

SELLING STOCKHOLDERS

The Common Stock being offered by the Selling Stockholders consists of shares of Common Stock issuable to the Selling Stockholders upon exercise of the Warrants. For additional information regarding the issuances of the Warrants, see "[July 2024 Offering](#)" in the Prospectus Summary section above. We are registering the shares of Common Stock in order to permit the Selling Stockholders to offer the shares for resale from time to time. Except for (a) the ownership of the Warrants and other equity sold by us to the Selling Stockholders and (b) with respect to the Warrants issued as compensation to the Placement Agent, who has acted as our Placement Agent in a number of past offerings, or its designees, the Selling Stockholders have not had any material relationship with us within the past three years.

The table below is based on information supplied to us by the Selling Stockholders, and lists the Selling Stockholders and other information regarding the beneficial ownership of the shares of Common Stock by each of the Selling Stockholders. The second column lists the number of shares of Common Stock beneficially owned by each Selling Stockholder, based on its ownership of the Warrants, as of July 17, 2024, assuming exercise of the Warrants held by the Selling Stockholders on that date, without regard to any limitations on exercises.

The third column lists the shares of Common Stock being offered under this prospectus by the Selling Stockholders.

In accordance with the terms of the Inducement Letter Agreements with the Selling Stockholders, this prospectus generally covers the resale of the maximum number of shares of Common Stock issuable upon exercise of the related Warrants issued in and in connection with the Inducement Letter Agreements, determined as if the outstanding Warrants were exercised in full as of the trading day immediately preceding the date this registration statement was initially filed with the SEC, each as of the trading day immediately preceding the applicable date of determination, without regard to any limitations on the exercise of the Warrants. The fourth column assumes the sale of all of the shares offered by the Selling Stockholders pursuant to this prospectus. The percentage of beneficial ownership after this offering is based on 1,857,929 shares of Common Stock outstanding as of July 17, 2024.

Under the terms of the Warrants, a Selling Stockholder may not exercise the Warrants to the extent such exercise would cause such Selling Stockholder, together with its affiliates and attribution parties, to beneficially own a number of shares of Common Stock which would exceed 4.99% or 9.99%, as applicable, of our then outstanding Common Stock following such exercise, excluding for purposes of such determination shares of Common Stock issuable upon exercise of such Warrants which have not been exercised. The number of shares in the second and fourth columns do not reflect this limitation. The Selling Stockholder may sell all, some or none of their shares in this offering. See "[Plan of Distribution](#)" below for further information.

Selling Stockholders	Number of Shares Beneficially Owned Before this Offering ⁽¹⁾	Number of Shares to be Sold in this Offering	Shares Beneficially Owned After this Offering	
			Number of Shares	Percentage of Total Outstanding Common Stock ⁽¹⁾
Anson Investments Master Fund LP ⁽²⁾	418,494 ⁽³⁾	278,996	139,498	7.25%
Armistice Capital, LLC ⁽⁴⁾	173,056	133,056	40,000	2.15%
Intracoastal Capital, LLC ⁽⁵⁾	387,877 ⁽⁶⁾	261,714	126,163	6.51%
Sabby Volatility Warrant Master Fund, Ltd. ⁽⁷⁾	621,046 ⁽⁸⁾	416,806	204,240	10.01%
Michael Vasinkevich ⁽⁹⁾	48,588	26,225	22,363	1.19%
Noam Rubinstein ⁽⁹⁾	24,243	12,882	11,361	*
Craig Schwabe ⁽⁹⁾	2,554	1,380	1,174	*
Charles Worthman ⁽⁹⁾	772	409	363	*

* Represents beneficial ownership of less than one percent.

(1) The ability to exercise the Warrants held by the Selling Stockholders is subject to a beneficial ownership limitation that, at the time of initial issuance of the Warrants, was capped at either 4.99% or 9.99% beneficial ownership of our issued and outstanding Common Stock (post-exercise). These beneficial ownership limitations may be adjusted up or down, subject to providing advanced notice to us. Beneficial ownership as reflected in the selling stockholder table reflects the total number of shares potentially issuable underlying the Warrants and does not give effect to these beneficial ownership limitations. Accordingly, actual beneficial ownership, as calculated in accordance with Section 13(d) and Rule 13d-3 thereunder may be lower than as reflected in the table.

(2) Anson Advisors Inc. and Anson Funds Management LP, the Co-Investment Advisers of Anson Investments Master Fund LP (" **Anson**"), hold voting and dispositive power over the Common Stock held by Anson. Tony Moore is the managing member of Anson Management GP LLC, which is the general partner of Anson Funds Management LP. Moez Kassam and Amin Nathoo are directors of Anson Advisors Inc. Mr. Moore, Mr. Kassam and Mr. Nathoo each disclaim beneficial ownership of these shares of Common Stock except to the extent of their pecuniary interest therein. The principal business address of Anson is Maples Corporate Services Limited, PO Box 309, Ugland House, Grand Cayman, KY1-1104, Cayman Islands.

(3) Inclusive of 67,498 Abeyance Shares issuable to Anson pursuant to certain Existing Warrants held by Anson upon notice received from Anson that such Abeyance Shares may be issued in compliance with the beneficial ownership limitations contained in the Existing Warrants held by Anson.

(4) The securities are directly held by Armistice Capital Master Fund Ltd., a Cayman Islands exempted company (the " **Master Fund**"), and may be deemed to be beneficially owned by: (i) Armistice Capital, LLC (" **Armistice Capital**"), as the investment manager of the Master Fund; and (ii) Steven Boyd, as the Managing Member of Armistice Capital. The warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the Selling Stockholder from exercising that portion of the warrants that would result in the Selling Stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of Armistice Capital Master Fund Ltd. is c/o Armistice Capital, LLC, 510 Madison Avenue, 7th Floor, New York, NY 10022.

(5) Mitchell P. Kopin (" **Mr. Kopin**") and Daniel B. Asher (" **Mr. Asher**"), each of whom are managers of Intracoastal Capital LLC (" **Intracoastal**"), have shared voting control and investment discretion over the securities reported herein that are held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities and Exchange Act of 1934, as amended (the " **Exchange Act**")) of the securities reported herein that are held by Intracoastal.

(6) Inclusive of 78,857 Abeyance Shares issuable to Intracoastal pursuant to certain Existing Warrants held by Intracoastal upon notice received from Intracoastal that such Abeyance Shares may be issued in compliance with the beneficial ownership limitations contained in the Existing Warrants held by Intracoastal.

(7) Sabby Management, LLC, the investment manager to Sabby Volatility Warrant Master Fund, Ltd. (" **Sabby**"), has discretionary authority to vote and dispose of the shares held by Sabby and may be deemed to be the beneficial owner of these shares. Hal Mintz (" **Mr. Mintz**"), in his capacity as manager of Sabby Management, LLC, may also be deemed to have investment discretion and voting power over the shares held by Sabby. Sabby Management, LLC and Mr. Mintz each disclaim any beneficial ownership of these shares. As provided in footnote 1, the amounts shown in the "Shares Beneficially Owned After this Offering" columns reflect the total number of shares potentially issuable underlying the Warrants and do not give effect to Sabby's beneficial ownership limitation of 4.99% of our issued and outstanding Common Stock (post-exercise). Accordingly, actual beneficial ownership, as calculated in accordance with Section 13(d) and Rule 13d-3 thereunder is lower than as reflected in the table.

(8) Inclusive of 182,403 Abeyance Shares issuable to Sabby pursuant to certain Existing Warrants held by Sabby upon notice received from Sabby that such Abeyance Shares may be issued in compliance with the beneficial ownership limitations contained in the Existing Warrants held by Sabby.

(9) Each of the Selling Stockholders is affiliated with Wainwright, a registered broker dealer with a registered address of H.C. Wainwright & Co., LLC, 430 Park Ave, 3rd Floor, New York, NY 10022, and has sole voting and dispositive power over the securities held. The number of shares beneficially owned prior to this offering consist of shares of common stock issuable upon exercise of placement agent warrants, which were received as compensation. The Selling Stockholder acquired the placement agent warrants in the ordinary course of business and, at the time the placement agent warrants were acquired, the Selling Stockholder had no agreement or understanding, directly or indirectly, with any person to distribute such securities.

PLAN OF DISTRIBUTION

Each Selling Stockholder of the securities and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of their securities covered hereby on the principal trading market or any other stock exchange, market or trading facility on which the securities are traded or in private transactions. These sales may be at fixed or negotiated prices. A Selling Stockholder may use any one or more of the following methods when selling securities:

- ordinary brokerage transactions and transactions in which the broker dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the securities as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- settlement of short sales;
- in transactions through broker-dealers that agree with the Selling Stockholders to sell a specified number of such securities at a stipulated price per security;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The Selling Stockholders may also sell securities under Rule 144 or any other exemption from registration under the Securities Act of 1933, as amended (the " **Securities Act**"), if available, rather than under this prospectus.

Broker-dealers engaged by the Selling Stockholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the Selling Stockholders (or, if any broker-dealer acts as agent for the purchaser of securities, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with FINRA Rule 2121; and in the case of a principal transaction a markup or markdown in compliance with FINRA Rule 2121.

In connection with the sale of the securities or interests therein, the Selling Stockholders may enter into hedging transactions with broker-dealers

or other financial institutions, which may in turn engage in short sales of the securities in the course of hedging the positions they assume. The Selling Stockholders may also sell securities short and deliver these securities to close out their short positions, or loan or pledge the securities to broker-dealers that in turn may sell these securities. The Selling Stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities which require the delivery to such broker-dealer or other financial institution of securities offered by this prospectus, which securities such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The Selling Stockholders and any broker-dealers or agents that are involved in selling the securities may be deemed to be "underwriters" within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the securities purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Each Selling Stockholder has informed us that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the securities.

We are required to pay certain fees and expenses incurred incident to the registration of the securities.

We have agreed to keep this prospectus effective until all of the securities have been sold pursuant to this prospectus or Rule 144 under the Securities Act or any other rule of similar effect. The resale securities will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the resale securities covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Exchange Act, any person engaged in the distribution of the resale securities may not simultaneously engage in market making activities with respect to the Common Stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the Selling Stockholders will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of the Common Stock by the Selling Stockholders or any other person. We will make copies of this prospectus available to the Selling Stockholders and have informed them of the need to deliver a copy of this prospectus to each purchaser at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

DESCRIPTION OF SECURITIES TO BE REGISTERED

The following summary description of our capital stock is based on the provisions of our amended and restated certificate of incorporation and amended and restated bylaws and the applicable provisions of the Delaware General Corporation Law ("DGCL"). This information is qualified entirely by reference to the applicable provisions of our amended and restated certificate of incorporation, amended and restated bylaws and the DGCL. For information on how to obtain copies of our amended and restated certificate of incorporation and amended and restated bylaws, which are exhibits to the registration statement of which this prospectus forms a part, see the sections titled ["Where You Can Find More Information"](#) and ["Incorporation of Certain Information by Reference"](#) in this prospectus.

General

Our authorized capital stock consists of 100,000,000 shares of Common Stock, par value \$0.0001 per share and 10,000,000 shares of preferred stock, par value \$0.0001 per share.

Common Stock

Holders of our Common Stock are entitled to one vote per share for the election of members of our Board of Directors and on all other matters that require stockholder approval. Holders of our Common Stock may not cumulate votes for the election of directors. Subject to any preferential rights of any outstanding preferred stock, in the event of our liquidation, dissolution or winding up, holders of our Common Stock are entitled to share ratably in the assets remaining after payment of liabilities and the liquidation preferences of any outstanding preferred stock. Holders of Common Stock have the right to receive dividends when, as and if, declared by the Board of Directors. Our Common Stock does not carry any preemptive rights enabling a holder to subscribe for, or receive shares of, any class of our Common Stock or any other securities convertible into shares of any class of our Common Stock. There are no redemption or sinking-fund provisions applicable to our Common Stock.

Preferred Stock

The shares of preferred stock have such rights and preferences as our Board of Directors shall determine, from time to time, the Board of Directors may divide the preferred stock into any number of series and shall fix the designation and number of shares of each such series. Our Board of Directors may determine and alter the rights, powers, preferences and privileges, and qualifications, restrictions and limitations thereof, including, but not limited to, voting rights (if any), granted to and imposed upon any wholly unissued series of preferred stock. Our Board of Directors (within the limits and restrictions of any resolutions adopted originally fixing the number of shares of any series) may increase or decrease the number of shares of that series; provided, that no such decrease shall reduce the number of shares of such series to a number less than the number of shares of such series then outstanding, plus the number of shares reserved for issuance upon the exercise of outstanding options, rights or warrants or upon the conversion of any outstanding securities issued by us convertible into shares of such series.

Our Common Stock is subject to the express terms of our preferred stock and any series thereof. Our Board of Directors may issue preferred stock with voting, dividend, liquidation and other rights that could adversely affect the relative rights of the holders of our Common Stock.

Anti-Takeover Effects of Provisions of our Certificate of Incorporation and Bylaws

Certificate of Incorporation and Bylaw Provisions. Certain provisions of our amended and restated certificate of incorporation and amended and restated bylaws, which provisions are summarized in the following paragraphs, may have an anti-takeover effect and may delay, defer or prevent a takeover attempt that a stockholder might consider in its best interest, including those attempts that might result in a premium over the market price for the shares held by stockholders.

Filling Vacancies. Any vacancy on our Board of Directors, however occurring, including a vacancy resulting from an increase in the size of the Board of Directors, may only be filled by the affirmative vote of a majority of our directors then in office even if less than a quorum.

No Written Consent of Stockholders. Our amended and restated certificate of incorporation provides that all stockholder actions are required to be taken by a vote of the stockholders at an annual or special meeting, and that stockholders may not take any action by written consent in lieu of a meeting.

Advance Notice Requirements. Our amended and restated bylaws include advance notice procedures with regard to stockholder proposals relating to the nomination of candidates for election as directors or new business to be brought before meetings of our stockholders. These procedures provide that notice of stockholder proposals must be timely given in writing to our corporate secretary prior to the meeting at which the action is to be taken. Generally, to be timely, notice must be received at our principal executive offices not less than 90 days nor more than 120 days prior to the first anniversary date of the annual meeting for the preceding year. The notice must contain certain information specified in the amended and restated bylaws.

Amendment to Bylaws and Certificate of Incorporation. As required by the DGCL any amendment to our amended and restated certificate of incorporation must first be approved by a majority of our Board of Directors and, if required by law or our amended and restated certificate of incorporation, thereafter be approved by a majority of the outstanding shares entitled to vote on the amendment, and a majority of the outstanding shares of each class entitled to vote thereon as a class. Our amended and restated bylaws may be amended by the affirmative vote of a majority vote of the directors then in office, subject to any limitations set forth in the amended and restated bylaws.

Blank Check Preferred Stock. Our amended and restated certificate of incorporation provides for 10,000,000 authorized shares of preferred stock. The existence of authorized but unissued shares of preferred stock may enable our Board of Directors to render more difficult or to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest, or otherwise. In this regard, the amended and restated certificate of incorporation grants the Board of Directors broad power to establish the rights and preferences of authorized and unissued shares of preferred stock. The issuance of shares of preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of Common Stock. The issuance may also adversely affect the relative rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring, or preventing a change of control of the Company.

Exclusive Forum Provision in Certificate of Incorporation. Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware is the exclusive forum for the following types of actions or proceedings: any derivative action or proceeding brought on behalf of the Company, any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Company to the Company or the Company's stockholders, any action asserting a claim against the Company arising pursuant to any provision of the DGCL or our amended and restated certificate of incorporation or our amended and restated bylaws, or any action asserting a claim against us governed by the internal affairs doctrine. Despite the fact that our amended and restated certificate of incorporation provides for this exclusive forum provision to be applicable to the fullest extent permitted by applicable law, Section 27 of the Exchange Act, creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder and Section 22 of the Securities Act, creates concurrent jurisdiction for federal and state courts over all suits brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder. As a result, this provision of our amended and restated certificate of incorporation would not apply to claims brought to enforce a duty or liability created by the Securities Act, Exchange Act, or any other claim for which the federal courts have exclusive jurisdiction.

LEGAL MATTERS

Certain legal matters relating to the issuance of the securities offered hereby will be passed upon for us by Hogan Lovells US LLP.

EXPERTS

The consolidated financial statements of Phio Pharmaceuticals Corp. (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 have been so incorporated in reliance on the report of BDO USA, P.C., an independent registered public accounting firm, 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.

WHERE YOU CAN FIND MORE INFORMATION

We are required to file annual, quarterly and current reports, proxy statements and other information with the SEC. Our filings with the SEC are available to the public at the SEC's Internet web site at <http://www.sec.gov>. Copies of certain information filed by us with the SEC are also available on our website at www.phioharma.com. Our website is not a part of this prospectus and is not incorporated by reference in this prospectus, and you should not consider the contents of our website in making an investment decision with respect to our Common Stock.

We have filed a registration statement, of which this prospectus is a part, covering the securities offered hereby. As allowed by SEC rules, this prospectus does not include all of the information contained in the registration statement and the included exhibits, financial statements and schedules.

You are referred to the registration statement, the included exhibits, financial statements and schedules for further information. You should review the information and exhibits in the registration statement for further information about us and our subsidiaries and the securities we are offering. Statements in this prospectus concerning any document we filed as an exhibit to the registration statement or that we otherwise filed with the SEC are not intended to be comprehensive and are qualified by reference to these filings. You should review the complete document to evaluate these statements.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to “incorporate by reference” the information we have filed with them, which means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is an important part of this prospectus, and information that we file later with the SEC will automatically update and supersede this information. The documents we are incorporating by reference are:

- our Annual Report on [Form 10-K](#) for the year ended December 31, 2023, filed with the SEC on April 1, 2024;
- our Quarterly Report on [Form 10-Q](#) for the quarter ended March 31, 2024, filed with the SEC on May 9, 2024;
- our Current Reports on Form 8-K, filed with the SEC on [January 26, 2024](#), [May 17, 2024](#), [May 28, 2024](#), [June 21, 2024](#), [July 2, 2024](#), [July 5, 2024](#), [July 12, 2024](#) and [July 24, 2024](#); and
- the description of our Common Stock contained in our registration statement on [Form 8-A12B](#) filed with the SEC on February 7, 2014, as updated by the description of our Common Stock filed as [Exhibit 4.16](#) to our Annual Report on Form 10-K for the year ended December 31, 2023, including any amendment or report filed for the purpose of updating such description.

All documents we file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, except as to any portion of any report or document that is not deemed filed under such provisions, (1) on or after the date of filing of the registration statement containing this prospectus and prior to the effectiveness of the registration statement and (2) on or after the date of this prospectus until the earlier of the date on which all of the securities registered hereunder have been sold or the registration statement of which this prospectus forms a part has been withdrawn, shall be deemed incorporated by reference in this prospectus and to be a part of this prospectus from the date of filing of those documents and will be automatically updated and, to the extent described above, supersede information contained or incorporated by reference in this prospectus and previously filed documents that are incorporated by reference in this prospectus.

Nothing in this prospectus shall be deemed to incorporate information furnished but not filed with the SEC pursuant to Item 2.02, 7.01 or 9.01 of Form 8-K.

Upon written or oral request, we will provide without charge to each person, including any beneficial owner, to whom a copy of the prospectus is delivered a copy of any or all of the reports or documents incorporated by reference herein (other than exhibits to such documents, unless such exhibits are specifically incorporated by reference herein). You may request a copy of these filings, at no cost, by writing or telephoning us at the following address: Phio Pharmaceuticals Corp., 11 Apex Drive, Suite 300A, PMB 2006, Marlborough, Massachusetts 01752 Attention: Investor Relations, telephone: (508) 767-3861. We maintain a website at www.phiotherapeutics.com. You may access our definitive proxy statements on Schedule 14A, annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and periodic amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act with the SEC free of charge at our website as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC. The information contained in, or that can be accessed through, our website is not incorporated by reference in, and is not part of, this prospectus. We have not authorized any one to provide you with any information that differs from that contained in this prospectus. Accordingly, you should not rely on any information that is not contained in this prospectus. You should not assume that the information in this prospectus is accurate as of any date other than the date of the front cover of this prospectus.

Phio Pharmaceuticals Corp.



Up to 1,131,468 Shares of Common Stock

PROSPECTUS

PART II

Information Not Required in Prospectus

ITEM 13. OTHER EXPENSES OF ISSUANCE AND DISTRIBUTION

The following table sets forth the fees and expenses payable in connection with the registration of the Common Stock hereunder. All amounts other than the SEC registration fees are estimates.

Item	Amount to be paid
SEC registration fees	\$ 611.24
Legal fees and expenses	30,000.00
Accounting fees and expenses	28,000.00
Printing and miscellaneous expenses	2,000.00
Total	<u>\$ 60,611.24</u>

ITEM 14. INDEMNIFICATION OF DIRECTORS AND OFFICERS

Section 145 of the Delaware General Corporation Law ("DGCL") authorizes a corporation to indemnify its directors and officers against liabilities arising out of actions, suits and proceedings to which they are made or threatened to be made a party by reason of the fact that they have served or are currently serving as a director or officer to a corporation. The indemnity may cover expenses (including attorneys' fees) judgments, fines and amounts paid in settlement actually and reasonably incurred by the director or officer in connection with any such action, suit or proceeding. Section 145 permits corporations to pay expenses (including attorneys' fees) incurred by directors and officers in advance of the final disposition of such action, suit or proceeding. In addition, Section 145 provides that a corporation has the power to purchase and maintain insurance on behalf of its directors and officers against any liability asserted against them and incurred by them in their capacity as a director or officer, or arising out of their status as such, whether or not the corporation would have the power to indemnify the director or officer against such liability under Section 145.

Our amended and restated certificate of incorporation provides that we will indemnify to the fullest extent authorized or permitted by the DGCL or any other applicable law as now or hereafter in effect any person made, or threatened to be made, a defendant or witness to any action, suit or proceeding (whether civil, criminal or otherwise) by reason of the fact that he or she is or was a director of our corporation or by reason of the fact that such director, at our request, is or was serving any other corporation, partnership, joint venture, trust, employee benefit plan or other enterprise in any capacity. Our amended and restated certificate of incorporation also provides that no amendment or repeal of the amended and restated certificate of incorporation will apply to or have any effect on any right to indemnification provided in the amended and restated certificate of incorporation with respect to any acts or omissions occurring prior to such amendment or repeal.

As permitted by the DGCL, our bylaws, as amended, provide that we will indemnify to the fullest extent authorized or permitted by applicable law as now or hereafter in effect any person who was or is made, or is threatened to be made, a party or is otherwise involved in any action, suit or proceeding (whether civil, criminal, administrative or investigative), by reason of the fact that he or she (or a person for whom he or she is the legal representative) is or was a director or officer of our corporation, is or was serving at our request as a director, officer, employee, member, trustee or agent of another corporation or of a partnership, joint venture, trust, nonprofit entity or other enterprise.

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Consequently, no director of our corporation will be personally liable to our corporation or its stockholders for monetary damages for any breach of fiduciary duty by such a director as a director. However, notwithstanding the preceding sentence, a director will be liable to the extent provided by the DGCL (1) for any breach of the director's duty of loyalty to our corporation or its stockholders, (2) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (3) for payments of unlawful dividends or for unlawful stock repurchases or redemption, or (4) for any transaction from which the director derived an improper personal benefit.

We have entered into indemnification agreements with each of our executive officers and directors. These agreements provide that, subject to limited exceptions and among other things, we will indemnify each of our executive officers and directors to the fullest extent permitted by law and advance expenses to each indemnitee in connection with any proceeding in which a right to indemnification is available.

We also maintain insurance on behalf of any person who is or was our director, officer, trustee, employee or agent or serving at our request as a director, officer, trustee, employee or agent of another corporation, partnership, joint venture, trust, non-profit entity or other enterprise against any liability asserted against the person and incurred by the person in any such capacity, or arising out of his or her status as such.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted for directors, officers, or persons who control us, we have been informed that, in the opinion of the SEC, such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

ITEM 15. RECENT SALES OF UNREGISTERED SECURITIES

In the three years preceding the filing of this registration statement, we have issued the following securities that were not registered under the Securities Act.

On November 16, 2022, we entered into a subscription and investment representation agreement with Robert J. Bitterman, our President and Chief Executive Officer, who is an accredited investor, pursuant to which we agreed to issue and sell one share of our Series D Preferred Stock, par value \$0.0001 per share (the “**Series D Preferred Stock**”), to Mr. Bitterman for \$1,750 in cash. The sale closed on November 16, 2022. The share of our Series D Preferred Stock was entitled to at such time 17,500,000 votes per share exclusively with respect to any proposal to amend our amended and restated certificate of incorporation to effect a reverse stock split of our Common Stock (“**Reverse Stock Split**”). The terms of our Series D Preferred Stock provided that it would be voted, without action by the holder, on any such proposal in the same proportion as shares of our Common Stock were voted. The share of our Series D Preferred Stock otherwise had no voting rights except as otherwise required by the DGCL. Under its terms, the outstanding share of our Series D Preferred Stock was to be redeemed in whole, but not in part, at any time: (i) if such redemption was approved by our Board of Directors in its sole discretion or (ii) automatically and effective upon the approval by our stockholders of a Reverse Stock Split. Upon such redemption, the holder of the share of our Series D Preferred Stock was entitled to receive consideration of \$1,750 in cash. The share of our Series D Preferred Stock was redeemed in whole on January 4, 2023, upon the approval by our stockholders of a Reverse Stock Split.

On April 18, 2023, we entered into a securities purchase agreement relating to the registered direct offering and sale of 39,331 shares of our Common Stock at a purchase price of \$50.85 per share to certain accredited and institutional investors. In a concurrent private placement, we also issued warrants with a five and one-half year term to purchase up to 39,331 shares of Common Stock at an exercise price of \$48.60 per share and warrants with an eighteen month term to purchase up to 39,331 shares of Common Stock at an exercise price of \$48.60 per share to the same accredited and institutional investors. In connection with this offering, we also issued warrants to purchase up to 2,950 shares of our Common Stock at an exercise price of \$63.56 to our placement agent.

On May 31, 2023, we entered into a securities purchase agreements relating to (a) the registered direct offering and sale of 25,961 shares of our Common Stock at a purchase price of \$38.52 to certain accredited and institutional investors and (b) a concurrent private placement to the same accredited and institutional investors, in which we issued 8,000 shares of unregistered Common Stock at a purchase price of \$38.52 per share, unregistered pre-funded warrants to purchase up to 69,881 shares of Common Stock at a purchase price of \$38.511 and with an exercise price of \$0.009 per share, unregistered warrants with a five and one-half year term to purchase up to 103,842 shares of Common Stock at an exercise price of \$36.27 and unregistered warrants with an eighteen month term to purchase up to 103,842 shares of Common Stock at an exercise price of \$36.27. In connection with this offering, we also issued warrants to purchase up to 7,788 shares of our Common Stock at an exercise price of \$48.15 to our placement agent.

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On December 6, 2023, we entered into an inducement letter agreement (the “**December 2023 Inducement Letter Agreement**”) with certain holders of certain of our existing warrants to purchase up to an aggregate of 236,695 shares of our Common Stock originally issued to the holders on dates between October 2018 and June 2023 with an exercise price of \$48.60 or \$36.27 per share, as applicable (the “**December 2023 Existing Warrants**”). Pursuant to the December 2023 Inducement Letter Agreement, each of the holders agreed to exercise for cash the December 2023 Existing Warrants at a reduced exercise price of \$11.97 per share in consideration of our agreement to issue new unregistered five and one-half year term warrants to purchase up to 252,258 shares of Common Stock at an exercise price of \$9.72 and new unregistered eighteen month term warrants to purchase up to 221,132 shares of Common Stock at an exercise price of \$9.72. In connection with the December 2023 Inducement Letter Agreement, we also issued warrants to purchase up to 17,752 shares of our Common Stock at an exercise price of \$14.96 to our placement agent.

On July 11, 2024, we entered into inducement letter agreements (the “**July 2024 Inducement Letter Agreements**”) with certain holders of certain of our existing warrants to purchase up to an aggregate of 545,286 shares of our Common Stock, originally issued to the holders in February 2020 through December 2023, having exercise prices between \$324.00 and \$9.72 per share (the “**July 2024 Existing Warrants**”). Pursuant to the July 2024 Inducement Letter Agreements, the holders agreed to exercise for cash the July 2024 Existing Warrants at a reduced exercise price of \$5.45 per share in consideration of our agreement to issue new unregistered five and one-half year term warrants to purchase up to 583,098 shares of Common Stock at an exercise price of \$5.45 and new unregistered eighteen month term warrants to purchase up to 507,474 shares of Common Stock at an exercise price of \$5.45, each issued and sold at a price of \$0.125 per warrant share. In connection with the July 2024 Inducement Letter Agreements, we also issued warrants to purchase up to 40,896 shares of our Common Stock at an exercise price of \$6.8125 to our placement agent.

Unless otherwise noted, all of the transactions described in Item 15 were exempt from registration under the Securities Act pursuant to Section 4(a)(2) of the Securities Act in that such sales did not involve a public offering.

ITEM 16. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

Exhibits

Exhibit Number	Description	Incorporated by Reference Herein	
		Form	Date
3.1	Amended and Restated Certificate of Incorporation of Phio Pharmaceuticals Corp.	Current Report on Form 8-K (File No. 001-36304)	November 19, 2018
3.2	Certificate of Amendment to the Amendment and Restated Certificate of Incorporation of Phio Pharmaceuticals Corp.	Current Report on Form 8-K (File No. 001-36304)	January 14, 2020
3.3	Certificate of Amendment to the Amendment and Restated Certificate of Incorporation of Phio Pharmaceuticals Corp.	Current Report on Form 8-K (File No. 001-36304)	January 25, 2023
3.4	Certificate of Designation of Series D Preferred Stock, dated November 16, 2022.	Current Report on Form 8-K (File No. 001-36304)	November 16, 2022

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3.5	Certificate of Amendment to the Amendment and Restated Certificate of Incorporation of Phio Pharmaceuticals Corp.	Current Report on Form 8-K (File No. 001-36304)	July 2, 2024
3.6	Amended and Restated Bylaws of Phio Pharmaceutical Corp.	Current Report on Form 8-K (File No. 001-36304)	May 2, 2022

4.1	Form of Warrant.	Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-221173)	September 28, 2018
4.2	Form of Placement Agent Warrant.	Current Report on Form 8-K (File No. 001-36304)	November 19, 2019
4.3	Form of Warrant.	Current Report on Form 8-K (File No. 001-36304)	February 6, 2020
4.4	Form of Warrant.	Current Report on Form 8-K (File No. 001-36304)	February 13, 2020
4.5	Form of Underwriter Warrant.	Current Report on Form 8-K (File No. 001-36304)	February 13, 2020
4.6	Form of Warrant.	Current Report on Form 8-K (File No. 001-36304)	April 2, 2020
4.7	Form of Common Stock Warrant.	Current Report on Form 8-K (File No. 001-36304)	January 25, 2021
4.8	Form of Placement Agent Warrant.	Current Report on Form 8-K (File No. 001-36304)	February 17, 2021
4.9	Form of Series A Common Stock Warrant.	Current Report on Form 8-K (File No. 001-36304)	April 20, 2023
4.10	Form of Series B Common Stock Warrant.	Current Report on Form 8-K (File No. 001-36304)	April 20, 2023
4.11	Form of Series A Common Stock Warrant.	Current Report on Form 8-K (File No. 001-36304)	June 2, 2023
4.12	Form of Series B Common Stock Warrant.	Current Report on Form 8-K (File No. 001-36304)	June 2, 2023

4.13	Form of Series A/B Warrant.	Current Report on Form 8-K (File No. 001-36304)	December 8, 2023
4.14	Form of Placement Agent Warrant.	Current Report on Form 8-K (File No. 001-36304)	December 8, 2023
4.15	Form of Series C/D Warrant.	Current Report on Form 8-K (File No. 001-36304)	July 12, 2024
4.16	Form of Placement Agent Warrant.	Current Report on Form 8-K (File No. 001-36304)	July 12, 2024
4.17	Description of Securities Registered Pursuant to Section 12(b) of the Securities Exchange Act of 1934.	Annual Report on Form 10-K (File No. 001-36304)	March 26, 2020
5.1	Opinion of Hogan Lovells US LLP. *		
10.1	Patent and Technology Assignment Agreement between RXi Pharmaceuticals Corporation (formerly RNCS, Inc.) and Advirna, LLC, effective as of September 24, 2011.	Registration Statement on Form S-1 (File No. 333-177498)	October 25, 2011
10.2	Phio Pharmaceuticals Corp. 2020 Long Term Incentive Plan, as amended and restated.#	Current Report on Form 8-K (File No. 001-36304)	June 21, 2024
10.3	Form of Restricted Stock Unit Award under the Company's 2020 Long Term Incentive Plan.#	Annual Report on Form 10-K (File. 001-36304)	March 25, 2021
10.4	Form of Nonqualified Stock Option Award under the Company's 2020 Long Term Incentive Plan.#	Annual Report on Form 10-Q (File. 001-36304)	November 9, 2023
10.5	Phio Pharmaceuticals Corp. 2012 Long Term Incentive Plan.#	Quarterly Report on Form 10-Q (File No. 001-36304)	November 12, 2019
10.6	Form of Incentive Stock Option Award under the Company's 2012 Long Term Incentive Plan, as amended.#	Registration Statement on Form S-1 (File No. 333-191236)	September 18, 2013
10.7	Form of Non-Qualified Stock Option Award under the Company's 2012 Long Term Incentive Plan, as amended.#	Registration Statement on Form S-1 (File No. 333-191236)	September 18, 2013
10.8	RXi Pharmaceuticals Corporation Employee Stock Purchase Plan.#	Registration Statement on Form S-8 (File No. 333-277013)	August 24, 2018

10.9	Form of Indemnification Agreement.#	Amendment No. 3 to the Registration Statement on Form S-1 (File No. 333-177498)	January 23, 2012
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10.10	Employment Agreement, dated February 20, 2023, by and between Phio Pharmaceuticals Corp. and Robert Bitterman.#	Current Report on Form 8-K (File No. 001-36304)	February 22, 2023
10.11	Registration Rights Agreement, dated January 21, 2021, by and between the Company and the Purchasers signatory therein.	Current Report on Form 8-K (File No. 001-36304)	January 25, 2021
10.12	Form of Securities Purchase Agreement, dated April 18, 2023, by and between the Company and each of the Purchasers signatory thereto.	Current Report on Form 8-K (File No. 001-36304)	April 20, 2023
10.13	Form of Securities Purchase Agreement, dated May 31, 2023, by and between the Company and each of the Purchasers signatory thereto (Registered Direct Offering).	Current Report on Form 8-K (File No. 001-36304)	June 2, 2023
10.14	Form of Securities Purchase Agreement, dated May 31, 2023, by and between the Company and each of the Purchasers signatory thereto (PIPE Private Placement).	Current Report on Form 8-K (File No. 001-36304)	June 2, 2023
10.15	Form of Registration Rights Agreement, dated May 31, 2023, by and between the Company and each of the Purchasers signatory thereto.	Current Report on Form 8-K (File No. 001-36304)	June 2, 2023
10.16	Form of Inducement Letter Agreement, dated July 11, 2024, by and between Phio Pharmaceuticals Corp. and the Holders.	Current Report on Form 8-K (File No. 001-36304)	July 12, 2024
23.1	Consent of BDO USA, P.C., an Independent Registered Public Accounting Firm.*		
23.2	Consent of Hogan Lovells US, LLP (included within exhibit 5.1).*		
24.1	Powers of Attorney (included on the signature page of Part II of the Registration Statement on Form S-1).*		
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)		
107	Filing Fee Table.*		

* Filed herewith.

Indicates a management contract or compensatory plan or arrangement.

Financial Statement Schedules

All schedules have been omitted because either they are not required, are not applicable or the information is otherwise set forth in the financial statements and related notes thereto incorporated by reference herein.

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ITEM 17. UNDERTAKINGS

(a) The undersigned Registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

Provided, however, that Paragraphs (a)(1)(i), (ii), and (iii) of this section do not apply if the registration statement is on Form S-1, Form S-3, Form SF-3, or Form F-3 and the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to section 13 or section 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m or 78o(d)) that are incorporated by reference in the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be

a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof;

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering;

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(i) Each prospectus filed by the Registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date;

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(5) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to section 13(a) or section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(6) Insofar as indemnification for liabilities arising under the Securities Act of 1933, as amended may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is therefore unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

(b) The undersigned Registrant hereby undertakes that:

(i) For purposes of determining any liability under the Securities Act of 1933, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the Registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act of 1933 shall be deemed to be part of this registration statement as of the time it was declared effective.

(ii) For the purpose of determining any liability under the Securities Act of 1933, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

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SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in Marlborough, Massachusetts, on July 26, 2024.

PHIO PHARMACEUTICALS CORP.

By: /s/ Robert Bitterman
Robert Bitterman
President and Chief Executive Officer

Power of Attorney

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Robert Bitterman as attorney-in-fact, with power of substitution, in any and all capacities, to sign any and all amendments and post-effective amendments to this registration statement, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that said attorney-in-fact, or his substitute or substitutes, may do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

Signatures

Title

Date

/s/ Robert J. Bitterman Robert J. Bitterman	President, Chief Executive Officer and Director (Principal Executive Officer and Principal Financial Officer)	July 26, 2024
/s/ Caitlin Kontulis Caitlin Kontulis	Vice President of Finance and Administration and Secretary (Principal Accounting Officer)	July 26, 2024
/s/ Patricia Bradford Patricia Bradford	Director	July 26, 2024
/s/ Robert L. Ferrara Robert L. Ferrara	Director	July 26, 2024
/s/ Jonathan E. Freeman Jonathan E. Freeman, Ph.D.	Director	July 26, 2024
/s/ Curtis A. Lockshin Curtis A. Lockshin, Ph.D.	Director	July 26, 2024

Exhibit 5.1



Hogan Lovells US LLP
1735 Market Street, Floor 23
Philadelphia, PA 19103
T +1 267 675 4600
F +1 267 675 4601
www.hoganlovells.com

July 26, 2024

Board of Directors
Phio Pharmaceuticals Corp.
257 Simarano Drive, Suite 101
Marlborough, MA 01752

Ladies and Gentlemen:

We are acting as counsel to Phio Pharmaceuticals Corp., a Delaware corporation (the "Company"), in connection with its registration statement on Form S-1 (the "Registration Statement"), filed with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Act"), relating to the resale or other disposition, from time to time, by the selling stockholders listed in the Registration Statement (the "Selling Stockholders"), including their transferees, pledgees, donees or successors, of up to 1,131,468 shares of common stock (the "Common Stock"), par value \$0.0001 per share, consisting of up to 1,131,468 shares of Common Stock (the "Warrant Shares") issuable upon exercise of warrants to purchase 1,131,468 shares of Common Stock (the "Warrants"), issued by the Company to the Selling Stockholders on July 12, 2024, as described in the prospectus that forms a part of the Registration Statement (the "Prospectus"). This opinion letter is furnished to you at your request to enable you to fulfill the requirements of Item 601(b)(5) of Regulation S-K, 17 C.F.R. § 229.601(b)(5), in connection with the Registration Statement.

For purposes of this opinion letter, we have examined copies of such agreements, instruments and documents as we have deemed an appropriate basis on which to render the opinions hereinafter expressed, including the Warrants. In our examination of the aforesaid documents, we have assumed the genuineness of all signatures, the legal capacity of all natural persons, the accuracy and completeness of all documents submitted to us, the authenticity of all original documents, and the conformity to authentic original documents of all documents submitted to us as copies (including pdfs). As to all matters of fact, we have relied on the representations and statements of fact made in the documents so reviewed, and we have not independently established the facts so relied on. This opinion letter is given, and all statements herein are made, in the context of the foregoing.

This opinion letter is based as to matters of law solely on the Delaware General Corporation Law, as amended. We express no opinion herein as to any other statutes, rules or regulations.

Based upon, subject to and limited by the foregoing, we are of the opinion that, as of the date hereof, (a) Warrant Shares have been duly authorized by all necessary corporate action on the part of the Company and (b) with respect to the Warrant Shares, following (i) the exercise of the Warrants in accordance with their terms and (ii) receipt by the Company of the consideration for the Warrant Shares specified in the Warrants, the Warrant Shares will be validly issued, fully paid, and nonassessable.

This opinion letter has been prepared for use in connection with the Registration Statement. We assume no obligation to advise of any changes in the foregoing subsequent to the effective date of the Registration Statement.

We hereby consent to the filing of this opinion letter as Exhibit 5.1 to the Registration Statement and to the reference to this firm under the caption "Legal Matters" in the Prospectus. In giving this consent, we do not thereby admit that we are an "expert" within the meaning of the Act.

Very truly yours,

/s/ HOGAN LOVELLS US LLP

HOGAN LOVELLS US LLP

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

Phio Pharmaceuticals Corp.
Marlborough, Massachusetts

We hereby consent to the incorporation by reference in the Prospectus constituting a part of this Registration Statement of our report dated April 1, 2024, relating to the consolidated financial statements of Phio Pharmaceuticals Corp. (the Company) appearing in the Company's Annual Report on Form 10-K for the year ended December 31, 2023. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

We also consent to the reference to us under the caption "Experts" in the Prospectus.

/s/ BDO USA, P.C.
Boston, Massachusetts
July 26, 2024

Calculation of Filing Fee Tables
Form S-1
(Form Type)

Phio Pharmaceuticals Corp.
(Exact Name of Registrant as Specified in Its Charter)

Table 1: Newly Registered and Carry Forward Securities

	Security Type	Security Class Title	Fee Calculation or Carry Forward Rule	Amount Registered (1)	Proposed Maximum Offering Price per Share (2)	Maximum Aggregate Offering Price (1)	Fee Rate	Amount of Registration Fee	Carry Forward Form Type	Carry Forward File Number	Carry Forward Initial Effective Date	Filing Fee Previously Paid in Connection with Unsold Securities to be Carried Forward
Newly Registered Securities												
Fees to be Paid	Equity	Common Stock, par value \$0.0001 per share	Rule 457(c)	1,131,468	\$3.66	\$4,141,173	\$147.60 per million	\$611.24	-	-	-	-
Fees Previously Paid	-	-	-	-	-	-	-	-	-	-	-	-
Carry Forward Securities												
Carry Forward Securities	-	-	-	-	-	-	-	-	-	-	-	-
	Total Offering Amounts					\$4,141,173		\$611.24				
	Total Fees Previously Paid							-				
	Total Fee Offsets							-				
	Net Fee Due							\$611.24				

- (1) Pursuant to Rule 416 under the Securities Act of 1933, as amended, or the Securities Act, this registration statement also covers any additional securities that may be offered, issued or become issuable in connection with any stock split, stock dividend or similar transaction or pursuant to anti-dilution provisions of any of the securities.
- (2) Estimated solely for the purpose of calculation of the registration fee pursuant to Rule 457(c) under the Securities Act based on a per share price of \$3.66, the average of the high and low reported sales prices of the registrant's common stock on the Nasdaq Capital Market on July 24, 2024.