

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)*

**257 Simarano Drive, Suite 101
Marlborough, Massachusetts 01752
(508) 767-3861**

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

**Gerrit Dispersyn, Dr. Med. Sc.
President & CEO
Phio Pharmaceuticals Corp.
257 Simarano Drive, Suite 101
Marlborough, Massachusetts 01752
(508) 767-3861**

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Copies to:

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Approximate date of commencement of proposed sale to the public:

As soon as practicable 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	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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.

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Amount to be registered ⁽¹⁾⁽²⁾	Proposed maximum offering price per share ⁽³⁾	Proposed maximum aggregate offering Price ⁽³⁾	Amount of registration fee
Common stock, par value \$0.0001 per share	8,125,946	\$0.3251	\$2,641,338.75	\$320.13

- (1) Represents shares of common stock which may be sold by the selling stockholder named in this registration statement. Pursuant to Rule 416 of the Securities Act of 1933, as amended (the “**Securities Act**”), this registration statement also covers such an indeterminate amount of shares of common stock as may become issuable to prevent dilution resulting from stock splits, stock dividends and similar events.
- (2) Represents 500,000 shares of common stock previously issued to the selling stockholder named herein, and 7,625,946 shares of common stock that are issuable pursuant to a common stock purchase agreement with the selling stockholder named herein.
- (3) Calculated pursuant to Rule 457(c) under the Securities Act, solely for the purpose of computing the amount of the registration fee, on the basis of the average of the high and low prices of the registrant’s common stock quoted on The Nasdaq Capital Market on August 28, 2019.

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, 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 nor does it seek an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to completion, dated August 30, 2019

PRELIMINARY PROSPECTUS



Up to 8,125,946 Shares of Common Stock

This prospectus covers the offer and sale of up to 8,125,946 shares of our common stock, \$0.0001 par value, by Lincoln Park Capital Fund, LLC (“**Lincoln Park**” or the “**Selling Stockholder**”).

The shares of common stock being offered to the Selling Stockholder have been or may be issued pursuant to the purchase agreement dated August 7, 2019 that we entered into with Lincoln Park (as amended on August 20, 2019, the “**Purchase Agreement**”). See “The Lincoln Park Transaction” for a description of the Purchase Agreement and “Selling Stockholder” for additional information regarding Lincoln Park. The prices at which Lincoln Park may sell the Shares will be determined by the prevailing market price for the Shares or in negotiated transactions.

We are not selling any securities under this prospectus and will not receive any of the proceeds from the sale of the Shares by the Selling Stockholder.

The Selling Stockholder may sell the shares of common stock described in this prospectus in a number of different ways and at varying prices. See “Plan of Distribution” for more information about how the Selling Stockholder may sell the shares of common stock being registered pursuant to this prospectus. The Selling Stockholder is an “underwriter” within the meaning of Section 2(a)(11) of the Securities Act of 1933, as amended (the “**Securities Act**”).

We will pay the expenses relating to the registration under the Securities Act of the offer and sale by Lincoln Park of the shares covered by this prospectus, including legal and accounting fees.

Our common stock is currently quoted on the Nasdaq Capital Market under the symbol “PHIO”. The closing price of our common stock on August 29, 2019, as reported by Nasdaq, was \$0.3301 per share.

Investing in our securities involves a high degree of risk. In reviewing this prospectus, you should consider carefully the risks and uncertainties in the section entitled “Risk Factors” beginning on page 4 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 securities are not being offered in any jurisdiction where the offer is not permitted.

The date of this prospectus is _____, 2019

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We have not authorized anyone to provide you with information other than that contained or incorporated by reference in this prospectus or in any free writing prospectus prepared by or on behalf of us or to which we have referred you. We take no responsibility for and can provide no assurance as to the reliability of, any other information that others may give to you. We are not offering to sell, and the Selling Stockholder is not offering to sell, securities in any jurisdictions where offers and sales are not permitted. The information contained or incorporated by reference in this prospectus or any free writing prospectus is accurate only as of its date, regardless of its time of delivery or any sale of our securities. Our business, financial condition, results of operations, and prospects may have changed since that date.

We urge you to carefully read this prospectus and any prospectus supplement, together with the information incorporated herein by reference as described under the heading “Where You Can Find Additional Information” and “Incorporation of Certain Information by Reference.”

No action is being taken in any jurisdiction outside the United States to permit an offering of our securities or possession or distribution of this prospectus in that jurisdiction. Persons who come into possession of this prospectus in jurisdictions outside the United States are required to inform themselves about and to observe any restrictions as to this offering and the distribution of this prospectus applicable to that jurisdiction.

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,” “should,” “potential,” “designed to,” “will” 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:

- our ability to obtain sufficient financing to develop our product candidates;
- expected ongoing significant research and development expenses without a current source of revenue, which may lead to uncertainty as to our ability to continue as a going concern;
- dilution that could be caused by future financing transactions or future issuances of capital stock in strategic transactions;
- our strategic focus on immuno-oncology;
- the novel and unproven approach associated with our RNAi technology;
- our limited experience as a company in immuno-oncology;
- identifying and developing product candidates, including whether we are able to commence clinical trials in humans or obtain approval for our product candidates;
- our dependence on the success of our product candidates, which may not receive regulatory approval or be successfully commercialized;
- factors could prevent us from obtaining regulatory approval or commercializing our product candidates on a timely basis, or at all;
- FDA regulation of our therapeutics;
- our reliance on in-licensed technologies and the potential need for additional intellectual property rights in the future;
- our ability to protect our intellectual property rights and the adequacy of our intellectual property rights;
- competitive risks, including the risks associated with competing against companies in the immuno-oncology space with significantly greater resources;
- our reliance on third parties for the manufacture of our clinical product candidates;
- potential product liability claims;
- pricing regulations, third-party reimbursement practices or healthcare reform initiatives;
- our ability to attract, hire and retain qualified personnel;
- effectiveness of our internal control over financial reporting; and
- volatility of our common stock.

Our actual results and financial condition may differ materially from those indicated in the forward-looking statements as a result of the foregoing factors, as well as those identified in this prospectus under the heading “Risk Factors” and in other filings the Company periodically makes with the Securities and Exchange Commission. 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 the Company 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.

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 4 of this prospectus and the financial statements and other information incorporated by reference in this prospectus. In this prospectus, unless otherwise noted, (1) the term “Phio” refers to Phio Pharmaceuticals Corp. and our subsidiary, MirImmune, LLC and (2) the terms “Company,” “we,” “us,” and “our” refer to the ongoing business operations of Phio and MirImmune, LLC, whether conducted through Phio or MirImmune, LLC.

Overview

Phio Pharmaceuticals Corp. is a biotechnology company developing the next generation of immuno-oncology therapeutics based on our self-delivering RNAi (“sd-rxRNA[®]”) therapeutic platform. The Company's efforts are focused on silencing tumor-induced suppression of the immune system through our proprietary sd-rxRNA platform with utility in immune cells and/or the tumor micro-environment. Our goal is to maximize the power of our sd-rxRNA therapeutic compounds by weaponizing immune effector cells to overcome tumor immune escape providing patients a powerful new treatment option that goes beyond current treatment modalities.

Our development efforts are based on our broadly patented sd-rxRNA technology platform. Our sd-rxRNA compounds do not require a delivery vehicle to penetrate into tissues and cells and are designed to “silence” or down-regulate, the expression of a specific gene which is over-expressed in cancer. We believe that our sd-rxRNA platform uniquely positions the Company in the field of immuno-oncology because of this and the following reasons:

- Efficient uptake of sd-rxRNA to immune cells obviating the need for facilitated delivery (mechanical or formulation);
- Can target multiple genes (i.e. multiple immunosuppression pathways) in a single therapeutic entity;
- Gene silencing by sd-rxRNA has been shown to have a sustained, or long-term, effect *in vivo*;
- Favorable clinical safety profile of sd-rxRNA with local administration; and
- Can be readily manufactured under current good manufacturing practices.

The self-delivering nature of our compounds makes sd-rxRNA ideally suited for use with adoptive cell transfer (“ACT”) treatments and direct therapeutic use. ACT consists of the infusion of immune cells with antitumor properties. These cells can be derived from unmodified (i.e. naturally occurring) immune cells, immune cells isolated from resected tumors, or genetically engineered immune cells recognizing tumor neoantigens/neoepitopes cells.

Currently, ACT therapies for the treatment of solid tumors face several hurdles. Multiple inhibitory mechanisms restrain immune cells used in ACT from effectively eradicating tumors, including immune checkpoints, reduced cell fitness and cell persistence. Furthermore, the immunosuppressive tumor micro-environment (the “TME”) can pose a formidable barrier to immune cell infiltration and function.

Phio has developed a platform based on our sd-rxRNA technology that allows easy, precise, rapid, and selective non-genetically modified programming of ACT cells (*ex-vivo*, during manufacturing) and of the TME (*in vivo*, by local application), resulting in improved cell-based immunotherapy.

For additional information about the Company, please refer to other documents we have filed with the Securities and Exchange Commission and that are incorporated by reference into this prospectus, as listed under the heading “Incorporation of Certain Information by Reference.”

Corporate Information

We were incorporated in the state of Delaware in 2011 as RXi Pharmaceuticals Corporation. On November 19, 2018, the Company changed its name to Phio Pharmaceuticals Corp., to reflect its transition from a platform company to one that is fully committed to developing groundbreaking immuno-oncology therapeutics. Our executive offices are located at 257 Simarano Drive, Suite 101, Marlborough, MA 01752, and our telephone number is (508) 767-3861. The Company's website is www.phiopharma.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.

THE OFFERING

Common stock to be offered
by the Selling Stockholder

8,125,946 shares consisting of:

- 500,000 Commitment Shares issued to Lincoln Park upon the execution of the Purchase Agreement; and
- 7,625,946 shares we may sell to Lincoln Park under the Purchase Agreement from time to time after the date of this prospectus, subject to the Exchange Cap and Beneficial Ownership Cap, as defined below under “Lincoln Park Transaction”

Common stock outstanding prior to this offering

25,091,197 shares, as of August 6, 2019

Common stock to be outstanding after this offering

33,217,143 shares, which gives effect to the issuance of a total of 8,125,946 shares under the Purchase Agreement.

Use of Proceeds

We will receive no proceeds from the sale of shares of common stock by Lincoln Park in this offering. We may receive up to \$10,000,000 in aggregate gross proceeds under the Purchase Agreement from any sales we make to Lincoln Park pursuant to the Purchase Agreement after the date of this prospectus. Any proceeds that we receive from sales to Lincoln Park under the Purchase Agreement will be used for working capital and general corporate purposes. See “Use of Proceeds.”

Risk factors

This investment involves a high degree of risk. See “Risk Factors” for a discussion of factors you should consider carefully before making an investment decision.

Trading Market

Our common stock is listed on The Nasdaq Capital Market under the symbol “PHIO.”

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 described below and discussed under the heading “Risk Factors” included in our most recent Annual Report on Form 10-K for the year ended December 31, 2018, as revised or supplemented by subsequent filings, which are on file with the Securities and Exchange Commission 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 Securities and Exchange Commission in the future.

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. The risks and uncertainties incorporated by reference into this prospectus are not the only ones we face. Additional risks and uncertainties not presently known or which we consider immaterial as of the date hereof may also have an adverse effect on our business.

Risks Related to This Offering

The sale or issuance of our common stock to Lincoln Park may cause dilution and the sale of the shares of common stock acquired by Lincoln Park, or the perception that such sales may occur, could cause the price of our common stock to fall.

On August 7, 2019, we entered into the Purchase Agreement with Lincoln Park, pursuant to which Lincoln Park has committed to purchase up to \$10,000,000 of our common stock. Upon the execution of the Purchase Agreement, we issued 500,000 Commitment Shares to Lincoln Park as a fee for its commitment to purchase shares of our common stock under the Purchase Agreement. The remaining shares of our common stock that may be issued under the Purchase Agreement may be sold by us to Lincoln Park at our discretion from time to time over a 30-month period commencing after the satisfaction of certain conditions set forth in the Purchase Agreement, including that the SEC has declared effective the registration statement that includes this prospectus, and subject to applicable Nasdaq limits on the number of shares that we can sell to Lincoln Park, absent stockholder approval. The purchase price for the shares that we may sell to Lincoln Park under the Purchase Agreement will fluctuate based on the price of our common stock. Depending on market liquidity at the time, sales of such shares may cause the trading price of our common stock to fall.

We generally have the right to control the timing and amount of any future sales of our shares to Lincoln Park. Additional sales of our common stock, if any, to Lincoln Park will depend upon market conditions and other factors to be determined by us. We may ultimately decide to sell to Lincoln Park all, some, or none of the additional shares of our common stock that may be available for us to sell pursuant to the Purchase Agreement. If and when we do sell shares to Lincoln Park, after Lincoln Park has acquired the shares, Lincoln Park may resell all, some or none of those shares at any time or from time to time in its discretion. Therefore, sales to Lincoln Park by us could result in substantial dilution to the interests of other holders of our common stock. Additionally, the sale of a substantial number of shares of our common stock to Lincoln Park, or the anticipation of such sales, could make it more difficult for us to sell equity or equity-related securities in the future at a time and at a price that we might otherwise wish to effect sales.

We may require additional financing to sustain our operations and without it we may not be able to continue operations.

The Company believes that its existing cash, and the potential proceeds available under the Purchase Agreement with Lincoln Park (assuming the Company is able to access the full amount), should be sufficient to fund the Company’s operations for at least the next twelve months. We have generated significant losses to date and expect to continue to incur significant operating losses as we advance our product candidates through drug development and the regulatory process. In the future, we will be dependent on obtaining funding from third parties, such as proceeds from the issuance of debt, sale of equity, funded research and development programs and payments under partnership and collaborative agreements, in order to maintain our operations and meet our obligations to licensors. There is no guarantee that debt, additional equity or other funding will be available to us on acceptable terms, or at all.

The extent we rely on Lincoln Park as a source of funding will depend on a number of factors including, the prevailing market price of our common stock and the extent to which we are able to secure working capital from other sources. If obtaining sufficient funding from Lincoln Park were to prove unavailable or prohibitively dilutive, we will need to secure another source of funding in order to satisfy our working capital needs. Even if we sell all \$10,000,000 under the Purchase Agreement to Lincoln Park, we may still need additional capital to fully implement our business, operating and development plans. Should the financing we require to sustain our working capital needs be unavailable or prohibitively expensive when we require it, the consequences could be a material adverse effect on our business, operating results, financial condition and prospects.

USE OF PROCEEDS

This prospectus relates to shares of our common stock that may be offered and sold from time to time by Lincoln Park. We will receive no proceeds from the sale of shares of common stock by Lincoln Park in this offering. We may receive up to \$10,000,000 in aggregate gross proceeds from any sales of our common stock to Lincoln Park under the Purchase Agreement after the date of this prospectus. We will pay the expenses relating to the registration under the Securities Act of the offer and sale by Lincoln Park of the shares covered by this prospectus, including legal and accounting fees.

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.

LINCOLN PARK TRANSACTION

General

On August 7, 2019, we entered into a purchase agreement with Lincoln Park, which, as amended on August 20, 2019, we refer to in this prospectus as the “Purchase Agreement,” pursuant to which Lincoln Park has agreed to purchase from us up to an aggregate of \$10,000,000 of our common stock (subject to certain limitations) from time to time over the term of the Purchase Agreement. Also on August 7, 2019, we entered into a registration rights agreement with Lincoln Park, which we refer to in this prospectus as the “Registration Rights Agreement,” pursuant to which we have filed with the SEC the registration statement that includes this prospectus to register for resale under the Securities Act of 1933, as amended, or the “Securities Act,” the shares of common stock that have been or may be issued to Lincoln Park under the Purchase Agreement.

Following the execution of the Purchase Agreement, we issued 500,000 shares of common stock to Lincoln Park as consideration for its commitment to purchase shares of our common stock under the Purchase Agreement, which we refer to in this prospectus as the “Commitment Shares.” We do not have the right to commence any sales of our common stock to Lincoln Park under the Purchase Agreement until certain conditions set forth in the Purchase Agreement, all of which are outside of Lincoln Park’s control, have been satisfied, including that the registration statement of which this prospectus is a part is declared effective by the Securities and Exchange Commission.

Thereafter, under the terms and subject to the conditions of the Purchase Agreement, we have the right to sell to Lincoln Park, and Lincoln Park is obligated to purchase, up to \$10,000,000 of shares of our common stock, subject to certain limitations set forth in the Purchase Agreement, from time to time, over a 30-month period.

Under the Purchase Agreement, on any business day selected by the Company, the Company may direct Lincoln Park to purchase shares of our common stock in amounts up to 200,000 shares (or up to \$50,000 in shares of common stock, whichever is greater) in a “regular purchase,” which amounts may be increased to up to 500,000 shares provided the market price of our common stock at the time of sale exceeds is not below certain threshold prices, as set forth in the Purchase Agreement, subject in each case to \$1,000,000 in total purchase proceeds per purchase date. In addition to regular purchases, the Company may also direct Lincoln Park to purchase additional amounts as accelerated purchases or as additional purchases if the Company has utilized the Regular Purchase Amount in full and if the closing sale price of the Common Stock exceeds certain threshold prices, as set forth in the Purchase Agreement. The purchase price of the shares that may be sold to Lincoln Park under the Purchase Agreement will be based on the market price of our common stock preceding the time of sale as computed under the Purchase Agreement.

In accordance with applicable rules of The Nasdaq Capital Market, the Purchase Agreement also limits the Company’s issuance of shares of Common Stock to Lincoln Park thereunder to 5,015,730 shares of Common Stock, representing 19.99% of the shares of Common Stock outstanding on the date of the Purchase Agreement (the “Exchange Cap”) unless (a) stockholder approval is obtained to issue more than such amount or (b) the average price of all applicable sales of our common stock to Lincoln Park under the Purchase Agreement equals or exceeds the lower of (i) the closing price of our common stock on the Nasdaq Capital Market immediately preceding August 7, 2019 plus an incremental amount or (ii) the average of the closing price of our common stock on the Nasdaq Capital Market for the five Business Days immediately preceding August 7, 2019 plus an incremental amount, such that issuances and sales of our common stock to Lincoln Park under the Purchase Agreement would be exempt from the Exchange Cap limitation under applicable Nasdaq rules.

The Purchase Agreement also prohibits us from directing Lincoln Park to purchase any shares of common stock if those shares, when aggregated with all other shares of our common stock then beneficially owned by Lincoln Park and its affiliates, would result in Lincoln Park and its affiliates having beneficial ownership, at any single point in time, of more than 9.99% of the then total outstanding shares of our common stock, as calculated pursuant to Section 13(d) of the Securities Exchange Act of 1934, as amended, or the “Exchange Act,” and Rule 13d-3 thereunder, which limitation we refer to as the “Beneficial Ownership Cap”.

There are no trading volume requirements or restrictions under the Purchase Agreement, and we will control the timing and amount of any sales of our common stock to Lincoln Park. We may at any time in our sole discretion terminate the Purchase Agreement without fee, penalty or cost upon one business days' notice. There are no restrictions on future financings, rights of first refusal, participation rights, penalties or liquidated damages in the Purchase Agreement or Registration Rights Agreement, other than a prohibition on entering into any "Variable Rate Transaction," as defined in the Purchase Agreement. Lincoln Park may not assign or transfer its rights and obligations under the Purchase Agreement.

A total of 8,125,946 shares of our common stock are being offered under this prospectus, which may be less than the amount of shares issuable under the Purchase Agreement. As of August 23, 2019, there were 25,591,197 shares of our common stock outstanding, of which 25,124,081 shares were held by non-affiliates. If all of the 8,125,946 shares offered by Lincoln Park under this prospectus were issued and outstanding as of August 23, 2019, such shares would represent 24% of the total number of shares of our common stock outstanding and 25% of the total number of outstanding shares held by non-affiliates, in each case as of the date hereof; however, these percentages do not give effect to the prohibition contained in the Purchase Agreement that prevents us from selling and issuing to Lincoln Park shares of our common stock that would cause us to exceed the Exchange Cap or that would cause Lincoln Park and its affiliates to exceed the Beneficial Ownership Cap.

If we elect to issue and sell more than the 8,125,946 shares offered under this prospectus to Lincoln Park, which we have the right, but not the obligation, to do, we must first register for resale under the Securities Act any such additional shares, which could cause additional substantial dilution to our stockholders. The number of shares ultimately offered for resale by Lincoln Park is dependent upon the number of shares we sell to Lincoln Park under the Purchase Agreement.

Issuances of our common stock in this offering will not affect the rights or privileges of our existing stockholders, except that the economic and voting interests of each of our existing stockholders will be diluted as a result of any such issuance. Although the number of shares of common stock that our existing stockholders own will not decrease, the shares owned by our existing stockholders will represent a smaller percentage of our total outstanding shares after any such issuance to Lincoln Park.

Purchase of Shares Under the Purchase Agreement

Under the Purchase Agreement, on any business day selected by us, we may direct Lincoln Park to purchase up to 200,000 shares of our common stock on any such business day, which we refer to as a "Regular Purchase," provided, however, that (i) the Regular Purchase may be increased to up to 300,000 shares, provided that the closing sale price is not below \$0.60 on the purchase date, (ii) the Regular Purchase may be increased to up to 400,000 shares, provided that the closing sale price is not below \$0.80 on the purchase date, and (iii) the Regular Purchase may be increased to up to 500,000 shares, provided that the closing sale price is not below \$1.00 on the purchase date. In each case, the maximum amount of any single Regular Purchase may not exceed \$1,000,000 per purchase. The purchase price per share for each such Regular Purchase will be equal to the lower of:

- the lowest sale price for our common stock on the purchase date of such shares; or
- the arithmetic average of the three lowest closing sale prices for our common stock during the 10 consecutive business days ending on the business day immediately preceding the purchase date of such shares.

In addition to Regular Purchases described above, we may also direct Lincoln Park, on any business day on which we have properly submitted a Regular Purchase for the full amount of our common stock permitted on such business day, to purchase an additional amount of our common stock, which we refer to as an "Accelerated Purchase," not to exceed the lesser of:

- 30% of the aggregate shares of our common stock traded during normal trading hours on the purchase date; and
- 3 times the number of purchase shares purchased pursuant to the corresponding Regular Purchase.

The purchase price per share for each such Accelerated Purchase will be equal to the lower of:

- 95% of the volume weighted average price during (i) the entire trading day on the purchase date, if the volume of shares of our common stock traded on the purchase date has not exceeded a volume maximum calculated in accordance with the Purchase Agreement, (ii) the portion of the trading day of the purchase date (calculated starting at the beginning of normal trading hours) until such time at which the volume of shares of our common stock traded has exceeded such volume maximum, or (iii) the portion of the trading day on the purchase date (calculated starting at the beginning of normal trading hours) until such time at which the sales price of our common stock has fallen below the minimum price threshold set forth in the notice for the Accelerated Purchase; or
- the closing sale price of our common stock on the accelerated purchase date.

We may also direct Lincoln Park, not later than 1:00 p.m., Eastern time, on a business day on which an Accelerated Purchase has been completed and all of the shares to be purchased thereunder have been delivered to Lincoln Park in accordance with the Purchase Agreement prior to such time on such business day to purchase an additional amount of our common stock, which we refer to as an Additional Accelerated Purchase, of up to the lesser of:

- 30% of the aggregate shares of our common stock traded during normal trading hours on the purchase date; and
- 3 times the number of purchase shares purchased pursuant to the corresponding Regular Purchase.

The purchase price per share for each such Additional Accelerated Purchase will be equal to the lower of:

- 95% of the volume weighted average price during (i) the entire trading day on the additional accelerated purchase date, if the volume of shares of our common stock traded on the purchase date has not exceeded a volume maximum calculated in accordance with the Purchase Agreement, (ii) the portion of the trading day of the purchase date (calculated starting at the beginning of normal trading hours) until such time at which the volume of shares of our common stock traded has exceeded such volume maximum, or (iii) the portion of the trading day on the purchase date (calculated starting at the beginning of normal trading hours) until such time at which the sales price of our common stock has fallen below the minimum price threshold set forth in the notice for the Additional Accelerated Purchase; or
- the closing sale price of our common stock on the additional accelerated purchase date.

The Company has the right, in its sole discretion, to set a minimum price threshold for each Accelerated Purchase and Additional Accelerated Purchase in the notice provided with respect to such Accelerated Purchase and Additional Accelerated Purchase, and the Company may direct multiple Regular, Accelerated and Additional Accelerated Purchases in a day provided that delivery of shares has been completed with respect to any prior Regular, Accelerated and Additional Accelerated Purchases that Lincoln Park has purchased.

In the case of the Regular Purchases, Accelerated Purchases and Additional Accelerated Purchases, the purchase price per share will be equitably adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction occurring during the business days used to compute the purchase price.

Other than as described above, there are no trading volume requirements or restrictions under the Purchase Agreement, and we will control the timing and amount of any sales of our common stock to Lincoln Park.

Events of Default

Events of default under the Purchase Agreement include the following:

- the effectiveness of the registration statement of which this prospectus forms a part lapses for any reason (including, without limitation, the issuance of a stop order), or any required prospectus supplement and accompanying prospectus are unavailable for the resale by Lincoln Park of our common stock offered hereby, and such lapse or unavailability continues for a period of 10 consecutive business days or for more than an aggregate of 30 business days in any 365-day period;
- suspension by our principal market of our common stock from trading for a period of one business day;
- the de-listing of our common stock from The NASDAQ Capital Market, our principal market, provided our common stock is not immediately thereafter trading on the New York Stock Exchange, the NASDAQ Global Market, the NASDAQ Global Select Market, the NYSE Market, the OTC Bulletin Board or OTC Markets (or nationally recognized successor thereto);
- the failure of our transfer agent to issue to Lincoln Park shares of our common stock within three business days after the applicable date on which Lincoln Park is entitled to receive such shares;
- any breach of the representations or warranties or covenants contained in the Purchase Agreement or Registration Rights Agreement that has or could have a material adverse effect on us and, in the case of a breach of a covenant that is reasonably curable, that is not cured within five business days;
- if at any time the Exchange Cap is reached, to the extent applicable;
- any voluntary or involuntary participation or threatened participation in insolvency or bankruptcy proceedings by or against us; or
- if at any time we are not eligible to transfer our common stock electronically.

Lincoln Park does not have the right to terminate the Purchase Agreement upon any of the events of default set forth above. During an event of default, all of which are outside of Lincoln Park's control, we may not direct Lincoln Park to purchase any shares of our common stock under the Purchase Agreement.

Our Termination Rights

We have the unconditional right, at any time, for any reason and without any payment or liability to us, to give notice to Lincoln Park to terminate the Purchase Agreement. In the event of bankruptcy proceedings by or against us, the Purchase Agreement will automatically terminate without action of any party.

No Short-Selling or Hedging by Lincoln Park

Lincoln Park has agreed that neither it nor any of its affiliates shall engage in any direct or indirect short-selling or hedging of our common stock during any time prior to the termination of the Purchase Agreement.

Prohibitions on Variable Rate Transactions

There are no restrictions on future financings, rights of first refusal, participation rights, penalties or liquidated damages in the Purchase Agreement or Registration Rights Agreement other than a prohibition on entering into a "Variable Rate Transaction," as defined in the Purchase Agreement.

Effect of Performance of the Purchase Agreement on Our Stockholders

All 8,125,946 shares registered in this offering which have been or may be issued or sold by us to Lincoln Park under the Purchase Agreement are expected to be freely tradable. It is anticipated that shares registered in this offering will be sold over a period of up to 30 months commencing on the date that the registration statement including this prospectus becomes effective. The sale by Lincoln Park of a significant amount of shares registered in this offering at any given time could cause the market price of our common stock to decline and to be highly volatile. Sales of our common stock to Lincoln Park, if any, will depend upon market conditions and other factors to be determined by us. We may ultimately decide to sell to Lincoln Park all, some or none of the additional shares of our common stock that may be available for us to sell pursuant to the Purchase Agreement. If and when we do sell shares to Lincoln Park, after Lincoln Park has acquired the shares, Lincoln Park may resell all, some or none of those shares at any time or from time to time in its discretion. Therefore, sales to Lincoln Park by us under the Purchase Agreement may result in substantial dilution to the interests of other holders of our common stock. In addition, if we sell a substantial number of shares to Lincoln Park under the Purchase Agreement, or if investors expect that we will do so, the actual sales of shares or the mere existence of our arrangement with Lincoln Park may make it more difficult for us to sell equity or equity-related securities in the future at a time and at a price that we might otherwise wish to effect such sales. However, we have the right to control the timing and amount of any additional sales of our shares to Lincoln Park and the Purchase Agreement may be terminated by us at any time at our discretion without any cost to us.

Pursuant to the terms of the Purchase Agreement, we have the right, but not the obligation, to direct Lincoln Park to purchase up to \$10,000,000 of our common stock, exclusive of the 500,000 shares issued to Lincoln Park on such date as a commitment fee. Depending on the price per share at which we sell our common stock to Lincoln Park pursuant to the Purchase Agreement, we may need to sell to Lincoln Park under the Purchase Agreement more shares of our common stock than are offered under this prospectus in order to receive aggregate gross proceeds equal to the \$10,000,000 total commitment available to us under the Purchase Agreement. If we choose to do so, we must first register for resale under the Securities Act such additional shares of our common stock, which could cause additional substantial dilution to our stockholders. The number of shares ultimately offered for resale by Lincoln Park under this prospectus is dependent upon the number of shares we direct Lincoln Park to purchase under the Purchase Agreement.

The Purchase Agreement prohibits us from issuing or selling to Lincoln Park under the Purchase Agreement (i) any shares of our common stock if those shares, when aggregated with all other shares of our common stock then beneficially owned by Lincoln Park and its affiliates, would exceed the Beneficial Ownership Cap and (ii) shares of our common stock in excess of the Exchange Cap, unless we obtain stockholder approval to issue shares in excess of the Exchange Cap or the average price of all applicable sales of our common stock to Lincoln Park under the Purchase Agreement equals or exceeds the lower of (a) the closing price of our common stock on the Nasdaq Capital Market immediately preceding August 7, 2019 plus an incremental amount or (b) the average of the closing price of our common stock on the Nasdaq Capital Market for the five Business Days immediately preceding August 7, 2019 plus an incremental amount, such that the transactions contemplated by the Purchase Agreement are exempt from the Exchange Cap limitation under applicable NASDAQ rules.

The following table sets forth the amount of gross proceeds we would receive from Lincoln Park from our sale of shares to Lincoln Park under the Purchase Agreement at varying purchase prices:

Assumed Average Purchase Price Per Share	Number of Registered Shares to be Issued if Full Purchase (1)	Percentage of Outstanding Shares After Giving Effect to the Issuance to Lincoln Park (2)	Proceeds from the Sale of Shares to Lincoln Park Under the \$10M Purchase Agreement
\$ 0.3301 (3)	5,015,730	16%	\$ 1,655,191
\$ 0.60	7,625,946	23%	\$ 4,575,568
\$ 0.80	7,625,946	23%	\$ 6,100,757
\$ 1.00	7,625,946	23%	\$ 7,625,946

(1) Although the Purchase Agreement provides that we may sell up to \$10,000,000 of our common stock to Lincoln Park, we are only registering 8,125,946 shares under this prospectus which represents: (i) 500,000 shares that we already issued to Lincoln Park as a commitment fee for making the commitment under the Purchase Agreement, and (ii) an additional 7,625,946 shares which may be issued to Lincoln Park in the future under the Purchase Agreement, if and when we sell shares to Lincoln Park under the Purchase Agreement, and which may or may not cover all the shares we ultimately sell to Lincoln Park under the Purchase Agreement, depending on the purchase price per share. As a result, we have included in this column only those shares that we are registering in this offering. If we seek to issue shares of our common stock, including shares from other transactions that may be aggregated with the transactions contemplated by the Purchase Agreement under the applicable rules of The NASDAQ Capital Market, in excess of 5,015,730 shares, or 19.99% of the total common stock outstanding immediately prior to the execution of the Purchase Agreement, we may be required to seek stockholder approval in order to be in compliance with the rules of The NASDAQ Capital Market.

(2) The denominator is based on 25,591,197 shares outstanding as of August 23, 2019, which includes (i) 500,000 commitment shares issued to Lincoln Park upon the execution of the Purchase Agreement, and (ii) the number of shares set forth in the adjacent column which we would have sold to Lincoln Park, assuming the purchase price in the adjacent column. The numerator is based on the number of shares issuable under the Purchase Agreement at the corresponding assumed purchase price set forth in the adjacent column.

(3) The closing sale price of our common stock on August 29, 2019.

DETERMINATION OF OFFERING PRICE

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

SELLING STOCKHOLDER

This prospectus relates to the possible resale by the Selling Stockholder, Lincoln Park, of shares of our common stock that have been or may be issued to Lincoln Park pursuant to the Purchase Agreement. We are filing the registration statement of which this prospectus forms a part pursuant to the provisions of the Registration Rights Agreement, which we entered into with Lincoln Park on August 7, 2019 concurrently with our execution of the Purchase Agreement, in which we agreed to provide certain registration rights with respect to sales by Lincoln Park of the shares of our common stock that have been or may be issued to Lincoln Park under the Purchase Agreement.

Lincoln Park, as the Selling Stockholder, may, from time to time, offer and sell pursuant to this prospectus any or all of the shares that we have issued or may issue to Lincoln Park under the Purchase Agreement. The Selling Stockholder may sell some, all or none of its shares. We do not know how long the Selling Stockholder will hold the shares before selling them, and we currently have no agreements, arrangements or understandings with the Selling Stockholder regarding the sale of any of the shares.

The following table presents information regarding the Selling Stockholder and the shares that it may offer and sell from time to time under this prospectus. The table is prepared based on information supplied to us by the Selling Stockholder, and reflects its holdings as of August 7, 2019. Neither Lincoln Park nor any of its affiliates has held a position or office, or had any other material relationship, with us or any of our predecessors or affiliates. Beneficial ownership is determined in accordance with Section 13(d) of the Exchange Act and Rule 13d-3 thereunder. The percentage of shares beneficially owned prior to the offering is based on 25,591,197 shares of our common stock actually outstanding as of August 23, 2019.

Selling Stockholder	Shares Beneficially Owned Before this Offering	Percentage of Outstanding Shares Beneficially Owned Before this Offering	Shares to be Sold in this Offering	Percentage of Outstanding Shares Beneficially Owned After this Offering
Lincoln Park Capital Fund, LLC (1)	2,556,561(2)	9.99(3)	8,125,946(4)	9.99%(5)

- (1) Josh Scheinfeld and Jonathan Cope, the Managing Members of Lincoln Park Capital, LLC, are deemed to be beneficial owners of all of the shares of common stock owned by Lincoln Park Capital Fund, LLC. Messrs. Cope and Scheinfeld have shared voting and investment power over the shares being offered under the prospectus filed with the SEC in connection with the transactions contemplated under the Purchase Agreement. Lincoln Park Capital, LLC is not a licensed broker dealer or an affiliate of a licensed broker dealer.
- (2) Represents (i) 500,000 Commitment Shares of our common stock issued to Lincoln Park upon our execution of the Purchase Agreement as a fee for its commitment to purchase shares of our common stock under the Purchase Agreement, all of which shares are covered by the registration statement that includes this prospectus; and (ii) an aggregate of 2,056,561 shares of our common stock, representing the maximum aggregate number of shares that may be issued to Lincoln Park as of the date of this prospectus upon exercise of warrants to purchase our common stock, at certain fixed prices (that may be subject to adjustment as provided in such warrants), which warrants were acquired by Lincoln Park in connection with our public offerings of securities in June 2015, December 2016, April 2018 and October 2018 (collectively, the “LPC Public Offering Warrants”). We have excluded from the number of shares beneficially owned by Lincoln Park prior to the offering: (a) an aggregate of 1,455,151 shares of our common stock underlying the LPC Public Offering Warrants, which, as of the date of this prospectus, may not be issued to Lincoln Park under the express terms of such warrants prohibiting us from issuing shares upon exercise of such warrants if such shares, when aggregated with all other shares of our common stock then beneficially owned by Lincoln Park and its affiliates, would result in Lincoln Park and its affiliates having beneficial ownership of more than 9.99% of the then total outstanding shares of our common stock, as calculated in accordance with the terms of such warrants; and (b) all of the additional shares of common stock that Lincoln Park may be required to purchase pursuant to the Purchase Agreement, because the issuance of such shares is solely at our discretion and is subject to certain conditions, the satisfaction of all of which are outside of Lincoln Park’s control, including the registration statement of which this prospectus is a part becoming and remaining effective. Furthermore, under the terms of the Purchase Agreement, issuances and sales of shares of our common stock to Lincoln Park are subject to certain limitations on the amounts we may sell to Lincoln Park at any time, including the Exchange Cap and the Beneficial Ownership Cap. See the description under the heading “The Lincoln Park Transaction” for more information about the Purchase Agreement.

- (3) Based on 25,591,197 outstanding shares of our common stock as of August 23, 2019, which includes the 500,000 Commitment Shares we issued to Lincoln Park on August 7, 2019.
- (4) Although the Purchase Agreement provides that we may sell up to \$10,000,000 of our common stock to Lincoln Park, only 8,125,946 shares of our common stock are being offered under this prospectus, which represents: (i) 500,000 Commitment Shares issued to Lincoln Park upon our execution of the Purchase Agreement as a fee for its commitment to purchase shares of our common stock under the Purchase Agreement; and (ii) an aggregate of 7,625,946 shares of our common stock that may be sold by us to Lincoln Park at our discretion from time to time over a 30-month period commencing after the satisfaction of certain conditions set forth in the Purchase Agreement, including that the SEC has declared effective the registration statement that includes this prospectus. Depending on the price per share at which we sell our common stock to Lincoln Park pursuant to the Purchase Agreement, we may need to sell to Lincoln Park under the Purchase Agreement more shares of our common stock than are offered under this prospectus in order to receive aggregate gross proceeds equal to the \$10,000,000 total commitment available to us under the Purchase Agreement. If we choose to do so, we must first register for resale under the Securities Act such additional shares. The number of shares ultimately offered for resale by Lincoln Park is dependent upon the number of shares we sell to Lincoln Park under the Purchase Agreement.
- (5) Percentage represents the maximum aggregate number of shares issuable to Lincoln Park upon exercise of the LPC Public Offering Warrants under the terms of such warrants, after giving effect to the resale by Lincoln Park of all shares of common stock that have been or may be issued and sold by us pursuant to the Purchase Agreement and that are covered by this prospectus and referenced in footnote (4) above.

PLAN OF DISTRIBUTION

The common stock offered by this prospectus is being offered by the Selling Stockholder, Lincoln Park. The common stock may be sold or distributed from time to time by the Selling Stockholder directly to one or more purchasers or through brokers, dealers, or underwriters who may act solely as agents at market prices prevailing at the time of sale, at prices related to the prevailing market prices, at negotiated prices, or at fixed prices, which may be changed. The sale of the common stock offered by this prospectus could be effected in one or more of the following methods:

- ordinary brokers' transactions;
- transactions involving cross or block trades;
- through brokers, dealers, or underwriters who may act solely as agents;
- "at the market" into an existing market for the common stock;
- in other ways not involving market makers or established business markets, including direct sales to purchasers or sales effected through agents;
- in privately negotiated transactions; or
- any combination of the foregoing.

In order to comply with the securities laws of certain states, if applicable, the shares may be sold only through registered or licensed brokers or dealers. In addition, in certain states, the shares may not be sold unless they have been registered or qualified for sale in the state or an exemption from the state's registration or qualification requirement is available and complied with.

Lincoln Park is an "underwriter" within the meaning of Section 2(a)(11) of the Securities Act.

Lincoln Park has informed us that it intends to use an unaffiliated broker-dealer to effectuate all sales, if any, of the common stock that it may purchase from us pursuant to the Purchase Agreement. Such sales will be made at prices and at terms then prevailing or at prices related to the then current market price. Each such unaffiliated broker-dealer will be an underwriter within the meaning of Section 2(a)(11) of the Securities Act. Lincoln Park has informed us that each such broker-dealer will receive commissions from Lincoln Park that will not exceed customary brokerage commissions.

Brokers, dealers, underwriters or agents participating in the distribution of the shares as agents may receive compensation in the form of commissions, discounts, or concessions from the Selling Stockholder and/or purchasers of the common stock for whom the broker-dealers may act as agent. The compensation paid to a particular broker-dealer may be less than or in excess of customary commissions. Neither we nor Lincoln Park can presently estimate the amount of compensation that any agent will receive.

We know of no existing arrangements between Lincoln Park or any other stockholder, broker, dealer, underwriter or agent relating to the sale or distribution of the shares offered by this prospectus. At the time a particular offer of shares is made, a prospectus supplement, if required, will be distributed that will set forth the names of any agents, underwriters or dealers and any compensation from the Selling Stockholder, and any other required information.

We will pay the expenses incident to the registration, offering, and sale of the shares to Lincoln Park. We have agreed to indemnify Lincoln Park and certain other persons against certain liabilities in connection with the offering of shares of common stock offered hereby, including liabilities arising under the Securities Act or, if such indemnity is unavailable, to contribute amounts required to be paid in respect of such liabilities. Lincoln Park has agreed to indemnify us against liabilities under the Securities Act that may arise from certain written information furnished to us by Lincoln Park specifically for use in this prospectus or, if such indemnity is unavailable, to contribute amounts required to be paid in respect of such liabilities.

Lincoln Park has represented to us that at no time prior to the Purchase Agreement has Lincoln Park or its agents, representatives or affiliates engaged in or effected, in any manner whatsoever, directly or indirectly, any short sale (as such term is defined in Rule 200 of Regulation SHO of the Exchange Act) of our common stock or any hedging transaction, which establishes a net short position with respect to our common stock. Lincoln Park agreed that during the term of the Purchase Agreement, it, its agents, representatives or affiliates will not enter into or effect, directly or indirectly, any of the foregoing transactions.

We have advised Lincoln Park that it is required to comply with Regulation M promulgated under the Exchange Act. With certain exceptions, Regulation M precludes the selling stockholder, any affiliated purchasers, and any broker-dealer or other person who participates in the distribution from bidding for or purchasing, or attempting to induce any person to bid for or purchase any security which is the subject of the distribution until the entire distribution is complete. Regulation M also prohibits any bids or purchases made in order to stabilize the price of a security in connection with the distribution of that security. All of the foregoing may affect the marketability of the securities offered by this prospectus.

This offering will terminate on the date that all shares offered by this prospectus have been sold by Lincoln Park.

Our common stock is quoted on The NASDAQ Capital Market under the symbol "PHIO".

LEGAL MATTERS

Certain legal matters relating to the issuance of the securities offered by this prospectus will be passed upon for us by Gibson, Dunn & Crutcher LLP, San Francisco, California.

EXPERTS

The consolidated financial statements as of December 31, 2018 and 2017 and for each of the two years in the period ended December 31, 2018 incorporated by reference in this prospectus have been so incorporated in reliance on the report of BDO USA, LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the Securities and Exchange Commission (“SEC”). Our SEC filings are available to the public over the Internet at the SEC’s website at <http://www.sec.gov>. Copies of certain information filed by us with the SEC are also available on our website at www.phiofarma.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.

This prospectus is part of a registration statement that we filed with the SEC. This prospectus omits some information contained in the registration statement in accordance with SEC rules and regulations. 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, 2018](#), filed with the SEC on March 27, 2019;
- Our Quarterly Report on Form [10-Q for the period ended March 31, 2019](#), filed with the SEC on May 14, 2019 and our Quarterly Report on Form [10-Q for the period ended June 30, 2019](#), filed with the SEC on August 13, 2019;
- Our Current Reports on Form 8-K, filed with the SEC on [January 28, 2019](#), [February 15, 2019](#), and [August 9, 2019](#); and
- The description of our common stock contained in our registration statement on Form [8-A12B filed with the SEC on February 7, 2014](#), 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 is 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., 257 Simarano Drive, Suite 101, Marlborough, Massachusetts 01752 Attention: Investor Relations, telephone: (508) 767-3861. We maintain a website at www.phioharma.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 8,125,946 Shares of Common Stock

PROSPECTUS

, 2019

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 are estimates.

Item	Amount to be paid
SEC registration fees	\$ 320.13
Legal fees and expenses	55,000.00*
Accounting fees and expenses	7,500.00*
Transfer agent fees and expenses	3,000.00*
Miscellaneous expenses	5,000.00*
Total	<u>\$ 70,820.13</u>

* Estimated

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 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 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 certificate of incorporation also provides that no amendment or repeal of the certificate of incorporation will apply to or have any effect on any right to indemnification provided in the 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 a person for whom he 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.

Consequently, no director of the corporation will be personally liable to the 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 Delaware law (1) for any breach of the director’s duty of loyalty to the 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 in the Securities Act.

On January 6, 2017, the Company issued an aggregate of 275,036 shares of common stock and an aggregate of 1,118,224 shares of Series C Convertible Preferred Stock to Mirlmmune Inc. pursuant to that certain Stock Purchase Agreement dated January 6, 2017, in consideration for the Company's acquisition of Mirlmmune outstanding capital stock. On June 9, 2017, with the approval of the Company's stockholders in accordance with the Nasdaq stockholder approval requirements, Series C Convertible Preferred Stock outstanding were automatically converted into 111,822 shares of common stock, such that there were no shares of Series C Convertible Preferred Stock issued or outstanding after the conversion.

On August 8, 2017, the Company entered into a purchase agreement (the "2017 Purchase Agreement") with Lincoln Park. As a commitment fee for entering into the 2017 Purchase Agreement, the Company issued to Lincoln Park 45,000 shares of Company common stock at a price per share of \$5.80.

On April 11, 2018, the Company issued 1,510,604 shares of common stock, at a price of \$3.15 per share pursuant to that certain Securities Purchase Agreement dated April 9, 2018. In a concurrent private placement, we sold warrants to purchase a total of 1,132,953 shares of common stock at a price of \$0.125 per underlying warrant share and with an exercise price of \$3.15 per share. In connection with this offering, we issued warrants to purchase a total of 75,530 shares of our common stock with an exercise price of \$4.0546 per share to the placement agent, H.C. Wainwright & Co., LLC. We also agreed to pay the placement agent an aggregate fee equal to \$367,502, which represents 7.5% of the gross proceeds received by us from the sale of the securities in the offering and concurrent private placement.

On June 7, 2013, the Compensation Committee approved an employee stock purchase plan ("ESPP"), which was subsequently approved by the Company's stockholders at the Company's 2014 Annual Meeting of Stockholders and amended by the Company's stockholders at the Company's 2016 and 2018 Annual Meeting of Stockholders. The ESPP allows employees to contribute a percentage of their cash earnings, subject to certain maximum amounts, to be used to purchase shares of the Company's common stock on each of two semi-annual purchase dates. The purchase price is equal to 90% of the market value per share on either (a) the date of grant of a purchase right under the ESPP or (b) the date on which such purchase right is deemed exercised, whichever is lower.

As of June 30, 2019, an aggregate of 451,133 shares of common stock were reserved for issuance under the Company's ESPP, of which 6,516 shares of common stock have been issued under the ESPP and 444,617 shares are available for future issuances.

As of June 30, 2019, we have not sold any shares of common stock to employees, directors, and consultants for cash consideration upon the exercise of stock options and stock awards.

On August 7, 2019, the Company entered into a purchase agreement (the "2019 Purchase Agreement") with Lincoln Park. As a commitment fee for entering into the 2019 Purchase Agreement, the Company issued to Lincoln Park 500,000 shares of Company common stock at a price per share of \$0.3767.

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 or under Rule 701 promulgated under the Securities Act, in that they were offered and sold either pursuant to written compensatory plans or pursuant to a written contract relating to compensation, as provided by Rule 701.

ITEM 16. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

<u>Exhibit Number</u>	<u>Description</u>	<u>Incorporated by Reference Herein</u>	
		<u>Form</u>	<u>Date</u>
2.1	<u>Asset Purchase Agreement, dated March 1, 2013, between RXi Pharmaceuticals Corporation and OPKO Health, Inc. +</u>	Quarterly Report on Form 10-Q (File No. 000-54910)	May 15, 2013
2.2	<u>Stock Purchase Agreement, dated January 6, 2017, by and among RXi Pharmaceuticals Corporation, RXi Merger Sub, LLC, MirImmune Inc., certain shareholders named therein and Alexey Wolfson, Ph.D., in his capacity as Sellers' Representative.</u>	Current Report on Form 8-K (File No. 001-36304)	January 10, 2017
3.1	<u>Amended and Restated Certificate of Incorporation of Phio Pharmaceuticals Corp.</u>	Current Report on Form 8-K (File No. 001-36304)	November 19, 2018
3.2	<u>Amended and Restated Bylaws of Phio Pharmaceutical Corp.</u>	Current Report on Form 8-K (File No. 001-36304)	November 19, 2018
4.1	<u>Form of Warrant.</u>	Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-203389)	May 21, 2015
4.2	<u>Form of Warrant.</u>	Amendment No. 3 to the Registration Statement on Form S-1 (File No. 333-214199)	December 14, 2016
4.3	<u>Form of Warrant</u>	Current Report on Form 8-K (File No. 001-36304)	April 11, 2018
4.4	<u>Form of Placement Agent Warrant</u>	Current Report on Form 8-K (File No. 001-36304)	April 11, 2018
4.5	<u>Form of Warrant</u>	Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-221173)	September 28, 2018
4.6	<u>Form of Pre-Funded Warrant</u>	Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-221173)	September 28, 2018
5.1	Consent of Gibson, Dunn & Crutcher LLP **		

10.1	<u>Patent and Technology Assignment Agreement between RXi Pharmaceuticals Corporation (formerly RNCS, Inc.) and Advima, LLC, effective as of September 24, 2011.</u>	Registration Statement on Form S-1 (File No. 333-177498)	October 25, 2011
10.2	<u>RXi Pharmaceuticals Corporation 2012 Long Term Incentive Plan.*</u>	Registration Statement on Form S-8 (File No. 333-177498)	August 24, 2018
10.3	<u>Form of Restricted Stock Unit Award under the Company's 2012 Long Term Incentive Plan.*</u>	Amendment No. 2 to the Registration Statement on Form S-1 (File No. 333-177498)	December 29, 2011
10.4	<u>Form of Incentive Stock Option Award under the Company's 2012 Long Term Incentive Plan, as amended.*</u>	Registration Statement on Form S-1 (File No. 333-191236)	September 18, 2013
10.5	<u>Form of Non-Qualified Stock Option Award under the Company's 2012 Long Term Incentive Plan, as amended.*</u>	Registration Statement on Form S-1 (File No. 333-191236)	September 18, 2013
10.6	<u>RXi Pharmaceuticals Corporation Employee Stock Purchase Plan.*</u>	Registration Statement on Form S-8 (File No. 333-277013)	August 24, 2018
10.7	<u>Form of Indemnification Agreement.*</u>	Amendment No. 3 to the Registration Statement on Form S-1 (File No. 333-177498)	January 23, 2012
10.8	<u>Employment Agreement, dated April 27, 2012, between RXi Pharmaceuticals Corporation and Geert Cauwenbergh, Dr. Med. Sc.*</u>	Current Report on Form 8-K (File No. 333-177498)	May 3, 2012
10.9	<u>Employment Agreement, dated January 6, 2017, between RXi Pharmaceuticals Corporation and Alexey Eliseev, Ph.D.*</u>	Annual Report on Form 10-K (File No. 001-36304)	March 30, 2017
10.10	<u>Non-Competition Agreement, dated January 6, 2017, between RXi Pharmaceuticals Corporation and Alexey Eliseev, Ph.D.*</u>	Annual Report on Form 10-K (File No. 001-36304)	March 30, 2017
10.11	<u>Employment Agreement, dated April 24, 2017, between RXi Pharmaceuticals Corporation and Gerrit Dispersyn, Dr. Med. Sc.*</u>	Post-effective Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-214199)	May 4, 2017
10.12	<u>Employment Agreement, dated April 22, 2019, between Phio Pharmaceuticals Corp. and John A. Barrett, Ph.D. *</u>	Quarterly Report on Form 10-Q (File No. 000-36304)	May 14, 2019

10.13	Lease Agreement dated December 17, 2013 between RXi Pharmaceuticals Corporation and 257 Simarano Drive, LLC, Brighton Properties, LLC, Robert Stubblebine 1, LLC and Robert Stubblebine 2, LLC.	Current Report on Form 8-K (File No. 000-54910)	December 20, 2013
10.14	First Amendment to Lease dated January 22, 2019	Current Report on Form 8-K (File No. 001-36304)	January 28, 2019
10.15	Registration Rights Agreement, dated August 8, 2017, between RXi Pharmaceuticals Corporation and Lincoln Park Capital Fund, LLC.	Current Report on Form 8-K (File No. 001-36304)	August 9, 2017
10.16	Purchase Agreement, dated August 8, 2017, between RXi Pharmaceuticals Corporation and Lincoln Park Capital Fund, LLC.	Registration Statement on Form S-1 (File No. 333-220062)	August 18, 2017
10.17	Securities Purchase Agreement, dated April 9, 2018, by and between the Company and the Purchasers therein.	Current Report on Form 8-K (File No. 001-36304)	April 11, 2018
10.18	Purchase Agreement, dated as of August 7, 2019 by and between Phio Pharmaceuticals Corp. and Lincoln Park Capital Fund, LLC	Current Report on Form 8-K (File No. 001-36304)	August 9, 2019
10.19	First Amendment to Purchase Agreement by and between Phio Pharmaceuticals Corp. and Lincoln Park Capital Fund, LLC.**		
10.20	Registration Rights Agreement, dated as of August 7, 2019, by and between Phio Pharmaceuticals Corp. and Lincoln Park Capital Fund, LLC.	Current Report on Form 8-K (File No. 001-36304)	August 9, 2019
23.1	Consent of BDO USA, LLP, an Independent Registered Public Accounting Firm.**		
23.2	Consent of Gibson, Dunn & Crutcher LLP (included in Exhibit 5.1)**		
24.1	Powers of Attorney (included on the signature page of Part II of this Registration Statement on Form S-1) **		

* Indicates a management contract or compensatory plan or arrangement.

** Filed herewith.

+ Confidential treatment has been requested or granted for certain portions which have been blanked out in the copy of the exhibit filed with the Securities and Exchange Commission. The omitted information has been filed separately with the Securities and Exchange Commission.

ITEM 17. UNDERTAKINGS

Insofar as indemnification for liabilities arising under the Securities Act of 1933, as amended, or the Act, 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.

The Registrant hereby undertakes:

(a) 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)(i), (a)(ii) and (a)(iii) do not apply if 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 15(d) of the Exchange Act that are incorporated by reference in the registration statement.

(b) 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;

(c) 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;

(d) 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;

(e) That, 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;

(f) That, 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;

(g) To deliver or cause to be delivered with the prospectus, to each person to whom the prospectus is sent or given, the latest annual report to security holders that is incorporated by reference in the prospectus and furnished pursuant to and meeting the requirements of Rule 14a-3 or Rule 14c-3 under the Securities Exchange Act of 1934; and, where interim financial information required to be presented by Article 3 of Regulation S-X are not set forth in the prospectus, to deliver, or cause to be delivered to each person to whom the prospectus is sent or given, the latest quarterly report that is specifically incorporated by reference in the prospectus to provide such interim financial information; and

(h) 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.

August 30, 2019

Phio Pharmaceuticals Corp.
257 Simarano Drive, Suite 101
Marlborough, Massachusetts 01752

Re: *Phio Pharmaceuticals Corp.*
Registration Statement on Form S-1

Ladies and Gentlemen:

We have examined the Registration Statement on Form S-1 (the "Registration Statement"), of Phio Pharmaceuticals Corp., a Delaware corporation (the "Company"), filed with the Securities and Exchange Commission (the "Commission") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), in connection with the offering by the Company of up to 8,125,946 shares of the Company's common stock, par value \$0.0001 per share (the "Shares").

In arriving at the opinion expressed below, we have examined originals, or copies certified or otherwise identified to our satisfaction as being true and complete copies of the originals, of specimen common stock certificates, and such other documents, corporate records, certificates of officers of the Company and of public officials and other instruments as we have deemed necessary or advisable to enable us to render the opinions set forth below. In our examination, we have assumed without independent investigation the genuineness of all signatures, the legal capacity and competency of all natural persons, the authenticity of all documents submitted to us as originals and the conformity to original documents of all documents submitted to us as copies.

Based upon the foregoing, and subject to the assumptions, exceptions, qualifications and limitations set forth herein, we are of the opinion that the Shares, when issued against payment therefor as set forth in the Registration Statement, will be validly issued, fully paid and non-assessable.

We consent to the filing of this opinion as an exhibit to the Registration Statement, and we further consent to the use of our name under the caption "Legal Matters" in the Registration Statement and the prospectus that forms a part thereof. In giving these consents, we do not thereby admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act or the Rules and Regulations of the Commission.

Very truly yours,

/s/ GIBSON, DUNN & CRUTCHER

AMENDMENT NO. 1 TO PURCHASE AGREEMENT

THIS AMENDMENT NO. 1 TO PURCHASE AGREEMENT (this "Amendment") is made as of this 20th day of August, 2019 (the "Amendment Date"), by and between PHIO PHARMACEUTICALS CORP., a Delaware corporation (the "Company"), and LINCOLN PARK CAPITAL FUND, LLC, an Illinois limited liability company (the "Investor") and together with the Company, the "Parties").

WITNESSETH:

WHEREAS, the Company and the Investor entered into that certain Purchase Agreement, dated August 7, 2019 (the "Purchase Agreement"), for the purchase of up to Ten Million Dollars (\$10,000,000) of the Company's common stock, par value \$0.0001 per share; and

WHEREAS, due to a scrivener's error, each of the Company and the Investor have determined that it is in the best interest of the Parties to amend Section 1(r) and Section 1(mm) of the Purchase Agreement to reflect the intent of the Parties.

NOW, THEREFORE, in consideration of the representations, warranties and mutual covenants set forth herein, sufficiency of which is hereby acknowledged by the Company and the Purchaser as the parties hereto agree as follows:

1. Definitions; references; continuation of Purchase Agreement. Unless otherwise specified herein, each term used in this Amendment that is defined in the Purchase Agreement shall have the meaning assigned to such term in the Purchase Agreement. Each reference to "hereof," "hereto," "hereunder," "herein" and "hereby," and each other similar reference, and each reference to "this Agreement" and each other similar reference, contained in the Purchase Agreement shall refer to the Purchase Agreement as amended by this Amendment. Except as expressly amended in this Amendment, all terms and provisions of the Purchase Agreement shall continue and remain in full force and effect.

2. Amendments.

a. Amendment to Section 1(r). The Parties desire to amend Section 1(r), entitled "Base Price" and as such, Section 1(r) of the Purchase Agreement is hereby amended and restated and shall read in its entirety as follows:

"Base Price" means a price per Purchase Share equal to the sum of (i) the Signing Market Price and (ii) \$0.0431 (subject to adjustment for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction that occurs on or after the date of this Agreement).

b. Amendment to Section 1(nn). The Parties desire to amend Section 1(nn), entitled "Signing Market Price" and as such, Section 1(nn) of the Purchase Agreement is hereby amended and restated and shall read in its entirety as follows:

"Signing Market Price" means \$0.3891, representing the Nasdaq Official Closing Price on the date of this Agreement, which is calculated as the lower of (i) the most recent the Nasdaq Official Closing Price of the Common Stock on the Nasdaq Capital Market immediately preceding the execution of this Agreement or (ii) the average of the Nasdaq Official Closing Prices of the Common Stock on the Nasdaq Capital Market for the five Business Days immediately preceding the signing of this Agreement."

3. Effect on the Purchase Agreement. The Purchase Agreement, as amended hereby, shall remain in full force and effect and is hereby ratified and confirmed. Except as expressly set forth herein, the execution, delivery and effectiveness of this Amendment shall not operate as a waiver of any right, power or remedy of the Parties, nor constitute a waiver of any provision of the Purchase Agreement (or an agreement to agree to any future amendment, waiver or consent).

4. Governing Law; Dispute Resolution. This Amendment shall be governed by and construed in accordance with the laws of the State of Illinois. The Parties agree that the terms set forth in Section 12(a) of the Purchase Agreement shall be applicable to this Amendment and are hereby incorporated herein.

5. Entire Agreement. The Transaction Documents, including the Purchase Agreement as amended by this Amendment, together with the, constitute the full and entire understanding and agreement between the Parties with respect to the matters covered herein and therein.

6. Counterparts. This Amendment may be executed in counterparts, all of which shall be one, and the same, agreement.

*** Signature Page Follows ***

IN WITNESS WHEREOF, the Parties have executed this Amendment No. 1 to Purchase Agreement as of the Amendment Date.

THE COMPANY:

PHIO PHARMACEUTICALS CORP.

By: /s/ Gerrit Dispersyn
Name: Gerrit Dispersyn, Dr. Med. Sc.
Title: President & CEO

INVESTOR:

LINCOLN PARK CAPITAL FUND, LLC
BY: LINCOLN PARK CAPITAL, LLC
BY: ROCKLEDGE CAPITAL CORP.

By: /s/ Josh Scheinfeld
Name: Josh Scheinfeld
Title: President

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 March 27, 2019, relating to the consolidated financial statements of Phio Pharmaceuticals Corp. appearing in the Company's Annual Report on Form 10-K for the year ended December 31, 2018.

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

/s/ BDO USA, LLP
Boston, Massachusetts

August 30, 2019