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

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

RXi PHARMACEUTICALS CORPORATION
(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)

**Geert Cauwenbergh, Dr. Med. Sc.
President
Rxi Pharmaceuticals Corporation
257 Simarano Drive, Suite 101
Marlborough, Massachusetts 01752
(508) 767-3861**
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:
**Ryan A. Murr
Gibson, Dunn & Crutcher LLP
555 Mission Street, Suite 3000
San Francisco, CA 94105
Telephone: (415) 393-8373
Facsimile: (415) 374-8430**

Approximate date of commencement of proposed sale to the public:
From time to time after this registration statement becomes effective, as determined by the selling stockholders.

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, as amended, 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 Accelerated filer
 Non-accelerated filer (Do not check if a smaller reporting company) Smaller reporting company
 Emerging growth company

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

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	1,208,483	\$2.41	\$2,912,444	\$362.60

- (1) Represents shares of Common Stock, par value \$0.0001 per share, which may be sold by the selling stockholders named in this registration statement. Pursuant to Rule 416 of the Securities Act of 1933, as amended, 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 1,132,953 shares of Common Stock that are issuable upon the exercise of certain warrants issued pursuant to a securities purchase agreement with the selling stockholders named herein and 75,530 shares of Common Stock that are issuable upon exercise of certain warrants issued to our placement agent pursuant to an engagement letter.
- (3) Calculated pursuant to Rule 457(c), 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 May 4, 2018.

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

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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 May , 2018

PRELIMINARY PROSPECTUS



Up to 1,208,483 Shares of Common Stock

Pursuant to this prospectus, the selling stockholders identified herein (the “**Selling Stockholders**”) are offering on a resale basis an aggregate of 1,208,483 shares of common stock, par value \$0.0001 per share (the “**Common Stock**”), of RXi Pharmaceuticals Corporation (“**RXi**,” “**we**,” “**our**” or the “**Company**”), a Delaware corporation, 1,132,953 shares of which are issuable upon the exercise of outstanding warrants (the “**Warrants**”) purchased pursuant to a securities purchase agreement by and among the Company and the Selling Stockholders, dated April 9, 2018 (the “**Purchase Agreement**”) as well as 75,530 shares of which are issuable upon the exercise of Warrants issued to the Company’s placement agent in connection with the Purchase Agreement. We will not receive any of the proceeds from the sale by the Selling Stockholders of the Common Stock. Upon any exercise of the Warrants by payment of cash, however, we will receive the exercise price of the Warrants.

The Selling Stockholders may sell or otherwise dispose of the Common Stock covered by this prospectus in a number of different ways and at varying prices. We provide more information about how the Selling Stockholders may sell or otherwise dispose of the Common Stock covered by this prospectus in the section entitled “Plan of Distribution” on page 10. Discounts, concessions, commissions and similar selling expenses attributable to the sale of Common Stock covered by this prospectus will be borne by the Selling Stockholders. We will pay all expenses (other than discounts, concessions, commissions and similar selling expenses) relating to the registration of the Common Stock with the Securities and Exchange Commission.

Our common stock is currently quoted on The NASDAQ Capital Market under the symbol “RXII”. On May 8, 2018, the last reported sale price of our common stock on The NASDAQ Capital Market was \$2.29 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 7 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 , 2018

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We have not, and the Selling Stockholders have not, authorized anyone to provide you with information other than that contained or incorporated by reference in this prospectus and any applicable prospectus supplement or amendment. We have not, and the Selling Stockholders have not, authorized any person to provide you with different information. This prospectus is not an offer to sell, nor is it an offer to buy, these securities in any jurisdiction where the offer is not permitted. The information contained or incorporated by reference in this prospectus and any applicable prospectus supplement or amendment is accurate only as of its date. Our business, financial condition, results of operations, and prospects may have changed since that date.

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 SEC. 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

In this prospectus, unless the context otherwise requires, (1) the term “RXi” refers to RXi Pharmaceuticals Corporation and our subsidiary, MirImmune, LLC and (2) the terms “Company,” “we,” “us” and “our” refer to the ongoing business operations of RXi and MirImmune, LLC, whether conducted through RXi or MirImmune, LLC.

Overview

RXi Pharmaceuticals Corporation is a biotechnology company developing the next generation of immuno-oncology therapeutics based on our self-delivering RNAi, or sd-rxRNA®, therapeutic platform. Our sd-rxRNA compounds do not require a delivery vehicle to penetrate the cell and are designed to “silence,” or down-regulate, the expression of a specific gene that may be over-expressed in a disease condition. We believe that this provides RXi with a distinct advantage in adoptive cell transfer therapy, the Company’s initial focus and approach to immuno-oncology.

Prior to the acquisition of MirImmune Inc. in January 2017, the Company’s principal activities consisted of the preclinical and clinical development of our sd-rxRNA compounds and topical immunotherapy agent in the areas of dermatology and ophthalmology. In January 2018, after a thorough review of its business operations, development programs and financial resources, the Company made a strategic decision to focus solely on immuno-oncology to accelerate growth and support a potential return on investment for its stockholders. The Company’s business strategy will focus on the development of immuno-oncology therapeutics utilizing its proprietary sd-rxRNA technology. The Company plans to finalize its current ongoing clinical trials in dermatology and ophthalmology with RXI-109 and Samcyprone™ and intends to seek a partner and/or out-license both its dermatology and ophthalmology franchises to continue their clinical development and commercialization. The goal of any such transaction would be to allow the Company to monetize these clinical assets to further fund ongoing and future development work in our immuno-oncology programs and extend our financial runway.

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

Our offices are located at 257 Simarano Drive, Suite 101, Marlborough, Massachusetts 01752 and our telephone number is (508) 767-3861. Additional information about RXi can be found on our website, at www.rxipharma.com, and in our periodic and current reports filed with the SEC. Copies of our current and periodic reports filed with the SEC are available at the SEC Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549, and online at www.sec.gov and our website at www.rxipharma.com. No portion of our website is incorporated by reference into this prospectus.

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THE OFFERING

The Selling Stockholders identified in this prospectus are offering on a resale basis a total of 1,208,483 shares of Common Stock issuable upon the exercise of the Warrants.

Common stock to be offered by the Selling Stockholders	Up to 1,208,483 shares
Common Stock outstanding prior to this offering	4,255,566 shares, as of May 4, 2018
Common Stock to be outstanding after this offering	5,464,049 shares
Use of Proceeds	We will not receive any proceeds from the sale of the common shares by the Selling Stockholders, except for the Warrant exercise price paid for the Common Stock offered hereby and issuable upon the exercise of the Warrants. See "Use of Proceeds" on page 8 of this prospectus.
Risk factors	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.
Symbol on The NASDAQ Capital Market	"RXII"

RISK FACTORS

Investing in our securities involves a high degree of risk. Before investing in our securities, you should carefully consider the risks, uncertainties and assumptions contained in this prospectus and discussed under the heading “Risk Factors” included in our most recent Annual Report on Form 10-K for the year ended December 31, 2017, as revised or supplemented by subsequent filings, which are on file with the SEC and are incorporated herein by reference, and which may be amended, supplemented or superseded from time to time by other reports we file with the SEC in the future. 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.

USE OF PROCEEDS

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

DETERMINATION OF OFFERING PRICE

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

SELLING STOCKHOLDERS

This prospectus covers the possible resale by the Selling Stockholders identified in the table below of 1,208,483 shares of Common Stock issuable upon the exercise of the Warrants. The Selling Stockholders acquired the Warrants pursuant to the Purchase Agreement and we are filing the registration statement of which this prospectus is a part pursuant to the provisions of the Purchase Agreement.

The Selling Stockholders may sell some, all or none of their shares of Common Stock. We do not know how long the Selling Stockholders will hold the Warrants, whether any will exercise the Warrants, and upon such exercise, how long such Selling Stockholders will hold the shares of Common Stock before selling them, and we currently have no agreements, arrangements or understandings with the Selling Stockholders regarding the sale of any of the shares.

The following table presents information regarding the Selling Stockholders and the shares that each may offer and sell from time to time under this prospectus. The table is prepared based on information supplied to us by the Selling Stockholders without regard to ownership limitations set forth in the applicable agreements or other documents relating to such shares and without regard to initial exercise dates of warrants, including (i) all of the shares offered hereby, and (ii) to our knowledge, all other securities held by each of the Selling Shareholders as of the date hereof, and reflects their respective holdings as of May 4, 2018. No Selling Stockholder nor any affiliates of such Selling Stockholders has or have 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 4,255,566 shares of our Common Stock actually outstanding as of May 4, 2018.

<u>Selling Stockholder</u>	<u>Shares Beneficially Owned Before this Offering</u>	<u>Percentage of Outstanding Shares Beneficially Owned Before this Offering</u>	<u>Shares to be Sold in this Offering</u>	<u>Percentage of Outstanding Shares Beneficially Owned After this Offering</u>
Noam Rubinstein	81,593	1.9%	81,593	*
Charles Worthman	755	*	755	*
Michael Vasinkevich	50,983	1.2%	50,983	*
Sabby Volatility Warrant Master Fund, Ltd.(1)	717,009	15.6%	283,239	7.9%
Anson Investments Master Fund LP(2)	932,424	18.7%	283,239	11.0%
Lincoln Park Capital Fund, LLC(3)	848,164	17.8%	283,239	9.9%
Intracoastal Capital, LLC(4)	311,434	6.9%	225,435	1.6%

* Represents beneficial ownership of less than one percent.

- (1) Consists of 377,652 shares of Common Stock and Warrants to purchase 339,357 shares of Common Stock, exercisable within 60 days of May 4, 2018.
- (2) Consists of 205,698 shares of Common Stock and Warrants to purchase 726,726 shares of Common Stock, exercisable within 60 days of May 4, 2018.
- (3) Consists of 336,452 shares of Common Stock and Warrants to purchase 511,712 shares of Common Stock, exercisable within 60 days of May 4, 2018.
- (4) Consists of 54,499 shares of Common Stock and Warrants to purchase 256,935 shares of Common Stock, exercisable within 60 days of May 4, 2018.

PLAN OF DISTRIBUTION

The Common Stock offered by this prospectus is being offered by the Selling Stockholders. The Common Stock may be sold or distributed from time to time by each 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.

The Selling Stockholders also may resell all or a portion of the common shares in open market transactions in reliance upon Rule 144 under the Securities Act of 1933, as amended (the "Securities Act"), as permitted by that rule, or Section 4(a)(1) under the Securities Act, if available, rather than under this prospectus, provided that they meet the criteria and conform to the requirements of those provisions.

In connection with sales of the Common Stock, the Selling Stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the Common Stock in the course of hedging in positions they assume. The Selling Stockholders may also sell Common Stock short and if such short sale shall take place after the date that this prospectus is declared effective by the Commission, the Selling Stockholders may deliver Common Stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The Selling Stockholders may also loan or pledge common shares to broker-dealers that in turn may sell such shares, to the extent permitted by applicable law. The Selling Stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction). Notwithstanding the foregoing, the Selling Stockholders have been advised that they may not use shares registered on this registration statement to cover short sales of our common stock made prior to the date the registration statement, of which this prospectus forms a part, has been declared effective by the SEC.

The Selling Stockholders may, from time to time, pledge or grant a security interest in some or all of the Warrants or shares of Common Stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the common shares from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act, amending, if necessary, the list of selling stockholders to include the pledgee, transferee or other successors in interest as Selling Stockholders under this prospectus. The Selling Stockholders also may transfer and donate the shares of Common Stock in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

To the extent required, the shares of Common Stock to be sold, the names of the Selling Stockholders, the respective purchase prices and public offering prices, the names of any agents, dealer or underwriter, any applicable commissions or discounts with respect to a particular offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

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Under the securities laws of some states, the Common Stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the common shares may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

There can be no assurance that any Selling Stockholder will sell any or all of the Common Stock registered pursuant to the registration statement, of which this prospectus forms a part.

Each Selling Stockholder and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act, and the rules and regulations thereunder, including, without limitation, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the Common Stock by the Selling Stockholder and any other participating person. Regulation M may also restrict the ability of any person engaged in the distribution of the shares of Common Stock to engage in market-making activities with respect to the Common Stock. All of the foregoing may affect the marketability of the Common Stock and the ability of any person or entity to engage in market-making activities with respect to the Common Stock.

We will pay all expenses of the registration of the Common Stock, including, without limitation, SEC filing fees and expenses of compliance with state securities or "blue sky" laws reasonably agreed to in writing by us; *provided, however*, that each Selling Stockholder will pay all underwriting discounts and selling commissions, if any, and any legal expenses incurred by it.

This offering will terminate on the date that all shares offered by this prospectus have been sold by each Selling Stockholder.

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

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, 2017 and 2016 and for each of the two years in the period ended December 31, 2017 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 (the report on the financial statements contains an explanatory paragraph regarding the Company's ability to continue as a going concern) incorporated by reference, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We are required to file annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any document filed by us at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room. Our filings with the SEC are also available to the public at the SEC's Internet web site at <http://www.sec.gov>.

We have filed a registration statement, of which this prospectus is a part, covering the securities offered hereby. As allowed by SEC rules, this prospectus does not include all of the information contained in the Registration Statement and the included exhibits, financial statements and schedules. You are referred to the Registration Statement, the included exhibits, financial statements and schedules for further information. This prospectus is qualified in its entirety by such other information.

We are subject to the information and periodic reporting requirements of the Exchange Act and, in accordance therewith, file periodic reports, proxy statements and other information with the SEC. Such periodic reports, proxy statements and other information are available for inspection and copying at the public reference room and website of the SEC referred to above. We maintain a website at www.rxipharma.com. The reference to our website address does not constitute incorporation by reference of the information contained on our website, and you should not consider the contents of our website in making an investment decision with respect to our Common Stock.

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, 2017, filed with the SEC on March 26, 2018;
- Our Quarterly Reports on Form 10-Q/A for the periods ended March 31, 2017, June 30, 2017 and September 30, 2017 that we filed with the SEC on March 26, 2018;
- Our Current Reports on Form 8-K, filed with the SEC on January 5, 2018, January 24, 2018, March 26, 2018, March 29, 2018 and April 11, 2018;
- Our Proxy Statement on DEF 14A, filed with the SEC on April 26, 2018; and;

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- The description of our Common Stock contained in our registration on Form 8-A12B (File No. 001-36304) 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 documents 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 to whom a copy of the prospectus is delivered a copy of the 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: RXi Pharmaceuticals Corporation, 257 Simarano Drive, Suite 101, Marlborough, Massachusetts 01752 Attention: Investor Relations, telephone: (508) 767-3861. We maintain a website at <http://www.rxipharma.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.

RXi Pharmaceuticals Corporation



Up to 1,208,483 Shares of Common Stock

PROSPECTUS

May , 2018

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.

<u>Item</u>	<u>Amount to be paid</u>
SEC registration fees	\$ 362.60
Legal fees and expenses	20,000
Accounting fees and expenses	7,500
Printing and miscellaneous expenses	6,000
Total	\$33,862.60

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.

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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.

Holders of Series A Convertible Preferred Stock received dividends payable in shares of Series A Convertible Preferred Stock of 105 during the year ended December 31, 2015.

Holders of Series A-1 Convertible Preferred Stock received dividends payable in shares of Series A-1 Convertible Preferred Stock of 21 during the year ended December 31, 2015.

On January 6, 2017, the Company issued a total of 386,858 shares of common stock to MirImmune Inc. (“**MirImmune**”) pursuant to that certain Stock Purchase Agreement dated January 6, 2017, in consideration for the Company’s acquisition of MirImmune outstanding capital stock.

On August 8, 2017, The Company issued 45,000 shares of common stock, at a price per share of \$5.80, to Lincoln Park Capital Fund, LLC pursuant to that certain Purchase Agreement dated August 8, 2017.

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 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 December 31, 2017, an aggregate of 51,133 shares of common stock were reserved for issuance under the Company’s ESPP, of which 1,505 shares of common stock have been issued under the ESPP and 49,628 shares are available for future issuances.

As of December 31, 2017, 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 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 Common Stock with an exercise price of \$4.0546 per share to the placement agent.

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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, 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, or under Rule 506 of Regulation D promulgated under the Securities Act.

ITEM 16. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

Exhibit Number	Description	Incorporated by Reference Herein	
		Form	Date
3.1	<u>Amended and Restated Certificate of Incorporation of RXi Pharmaceuticals Corporation.</u>	Amendment No. 4 to the Registration Statement on Form S-1 (File No. 333-177498)	February 7, 2012
3.2	<u>Certificate of Designations, Preferences and Rights of Series A Convertible Preferred Stock of RXi Pharmaceuticals Corporation.</u>	Amendment No. 4 to Registration Statement Form S-1 (File No. 333-177498)	February 7, 2012
3.3	<u>Certificate of Amendment to the Amended and Restated Certificate of Incorporation of RXi Pharmaceuticals Corporation.</u>	Current Report on Form 8-K (File No. 000-54910)	July 22, 2013
3.4	<u>Certificate of Designations, Preferences and Rights of Series A-1 Convertible Preferred Stock of RXi Pharmaceuticals Corporation.</u>	Quarterly Report on Form 10-Q (File No. 000-54910)	August 14, 2013
3.5	<u>Certificate of Increase, filed with the Secretary of State of the State of Delaware on January 24, 2014.</u>	Current Report on Form 8-K (File No. 000-54910)	January 24, 2014
3.6	<u>Certificate of Amendment to the Amended and Restated Certificate of Incorporation of RXi Pharmaceuticals Corporation.</u>	Registration Statement on Form S-1 (File No. 333-203389)	April 13, 2015
3.7	<u>Certificate Eliminating the Series A Convertible Preferred Stock from the Certificate of Incorporation of RXi Pharmaceuticals Corporation.</u>	Quarterly Report on Form 10-Q (File No. 001-36304)	November 12, 2015
3.8	<u>Certificate Eliminating the Series A-1 Convertible Preferred Stock from the Certificate of Incorporation of RXi Pharmaceuticals Corporation.</u>	Quarterly Report on Form 10-Q (File No. 001-36304)	November 12, 2015
3.9	<u>Certificate of Amendment to the Amended and Restated Certificate of Incorporation of RXi Pharmaceuticals Corporation.</u>	Current Report on Form 8-K (File No. 000-54910)	April 14, 2016
3.10	<u>Certificate of Designation of Preferences and Rights of Series B Convertible Preferred Stock of RXi Pharmaceuticals Corporation.</u>	Current Report on Form 8-K (File No. 001-36304)	December 21, 2016
3.11	<u>Certificate of Designation of Preferences and Rights of Series C Convertible Preferred Stock of RXi Pharmaceuticals Corporation.</u>	Current Report on Form 8-K (File No. 001-36304)	January 10, 2017
3.12	<u>Certificate Eliminating the Series B Convertible Preferred Stock from the Certificate of Incorporation of RXi Pharmaceuticals Corporation.</u>	Quarterly Report on Form 10-Q (File No. 001-36304)	November 8, 2017
3.13	<u>Certificate Eliminating the Series B Convertible Preferred Stock from the Certificate of Incorporation of RXi Pharmaceuticals Corporation.</u>	Quarterly Report on Form 10-Q (File No. 001-36304)	November 8, 2017

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3.14	<u>Certificate of Amendment to the Amended and Restated Certificate of Incorporation of RXi Pharmaceuticals Corporation, filed with the Delaware Secretary of State on January 4, 2018.</u>	Current Report on Form 8-K (File No. 001-36304)	January 5, 2018
3.15	<u>Amended and Restated Bylaws of RXi Pharmaceuticals Corporation.</u>	Current Report on Form 8-K (File No. 001-36304)	June 9, 2017
5.1	<u>Opinion of Gibson, Dunn & Crutcher LLP**</u>		Filed herewith
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>	Amendment No. 3 to the Registration Statement on Form S-1 (File No. 333-177498)	January 23, 2012
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>Amendment to RXi Pharmaceuticals Corporation Long-Term Incentive Plan.*</u>	Registration Statement on Form S-1 (File No. 333-191236)	September 18, 2013
10.7	<u>Amendment to RXi Pharmaceuticals Corporation Long-Term Incentive Plan.*</u>	Definitive Proxy Statement on Schedule 14A (File No. 001-36304)	November 4, 2016
10.8	<u>RXi Pharmaceuticals Corporation Employee Stock Purchase Plan.*</u>	Registration Statement on Form S-1 (File No. 333-191236)	September 18, 2013
10.9	<u>Amendment to RXi Pharmaceuticals Corporation Employee Stock Purchase Plan.*</u>	Definitive Proxy Statement on Schedule 14A (File No. 001-36304)	November 4, 2016
10.10	<u>Form of Indemnification Agreement.*</u>	Amendment No. 3 to the Registration Statement on Form S-1 (File No. 333-177498)	January 23, 2012
10.11	<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
10.12	<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
10.13	<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
10.14	<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
10.15	<u>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.</u>	Current Report on Form 8-K (File No. 000-54910)	December 20, 2013
10.16	<u>Form of Securities Purchase Agreement.</u>	Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-203389)	May 21, 2015
10.17	<u>Registration Rights Agreement, dated August 8, 2017, between RXi Pharmaceuticals Corporation and Lincoln Park Capital Fund, LLC.</u>	Current Report on Form 8-K (File No. 001-36304)	August 9, 2017
10.18	<u>Purchase Agreement, dated August 8, 2017, between RXi Pharmaceuticals Corporation and Lincoln Park Capital Fund, LLC.</u>	Registration Statement on Form S-1 (File No. 333-220062)	August 18, 2017

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10.19	<u>Securities Purchase Agreement, dated April 9, 2018, by and between the Company and the Purchasers listed therein.</u>	Current Report on Form 8-K (File No. 001-36304)	April 13, 2018
23.1	<u>Consent of BDO USA, LLP, Independent Registered Public Accounting Firm**</u>		
23.2	<u>Consent of Gibson, Dunn & Crutcher LLP**</u>	Included in Exhibit 5.1	
24.1	<u>Powers of Attorney**</u>	Included on the signature page of Part II of this Registration Statement	

* Indicates a management contract or compensatory plan or arrangement.

** Filed herewith.

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

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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.

Signatures

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in Marlborough, Massachusetts, on May 9, 2018.

RXi PHARMACEUTICALS CORPORATION

By: /s/ Geert Cauwenbergh
Geert Cauwenbergh, Dr. Med. Sc.
President, Chief Executive Officer and Chief Financial Officer

Power of Attorney

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

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

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Geert Cauwenbergh</u> Geert Cauwenbergh, Dr. Med. Sc.	President, Chief Executive Officer, Chief Financial Officer and Director (Principal Executive Officer and Principal Financial Officer)	May 9, 2018
<u>/s/ Caitlin Kontulis</u> Caitlin Kontulis	Director of Finance and Secretary (Principal Accounting Officer)	May 9, 2018
<u>/s/ Robert J. Bitterman</u> Robert J. Bitterman	Director	May 9, 2018
<u>/s/ Keith L. Brownlie</u> Keith L. Brownlie	Director	May 9, 2018
<u>/s/ H. Paul Dorman</u> H. Paul Dorman	Director	May 9, 2018
<u>/s/ Jonathan E. Freeman</u> Jonathan E. Freeman, Ph.D.	Director	May 9, 2018
<u>/s/ Curtis A. Lockshin</u> Curtis A. Lockshin, Ph.D.	Director	May 9, 2018

GIBSON DUNN

Gibson, Dunn & Crutcher LLP
555 Mission Street
San Francisco, CA 94105-0921
Tel 415.393.8200
www.gibsondunn.com

Client: 79920-00011

May 9, 2018

RXi Pharmaceuticals Corporation
257 Simarano Drive, Suite 101
Marlborough, Massachusetts 01752

Re: *RXi Pharmaceuticals Corporation*
Registration Statement on Form S-1

Ladies and Gentlemen:

We have examined the Registration Statement on Form S-1, as amended (the "Registration Statement"), of RXi Pharmaceuticals Corporation, 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 1,208,483 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

Beijing • Brussels • Century City • Dallas • Denver • Dubai • Frankfurt • Hong Kong • Houston • London • Los Angeles • Munich
New York • Orange County • Palo Alto • Paris • San Francisco • São Paulo • Singapore • Washington, D.C.

Consent of Independent Registered Public Accounting Firm

RXi Pharmaceuticals Corporation
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 26, 2018, relating to the consolidated financial statements of RXi Pharmaceuticals Corporation appearing in the Company's Annual Report on Form 10-K for the year ended December 31, 2017. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

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

/s/ BDO USA, LLP
Boston, Massachusetts

May 9, 2018