

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549**

**FORM S-8
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)

45-3215903
(IRS Employer
Identification No.)

**1500 West Park Drive
Westborough, Massachusetts 01581**
(Address, including zip code, of registrant's principal executive offices)

RXi Pharmaceuticals Corporation 2012 Long Term Incentive Plan
(Full title of the plan)

**Geert Cauwenbergh, Dr. Med. Sc.
President
Rxi Pharmaceuticals Corporation
1500 West Park Drive
Westborough, Massachusetts 01581
(508) 767-3861**
(Name, address and telephone number, including area code, of agent for service)

Copies to:

**Ryan A. Murr, Esq.
Ropes & Gray LLP
Three Embarcadero Center
San Francisco, California 94111-4006
Phone: (415) 315-6395
Fax: (415) 315-6026**

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

Large accelerated filer
Non-accelerated filer
(Do not check if a smaller reporting company)

Accelerated filer
Smaller reporting company

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Amount to be Registered (1)	Proposed Maximum Offering Price Per Share	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee
Common Stock, \$0.0001 par value per share	26,152,062 (2)	\$ 0.116 (4)	\$3,033,639.19	\$ 347.66
Common Stock, \$0.0001 par value per share	16,742,743 (3)	\$ 0.130	\$2,176,556.59	\$ 249.43
Common Stock, \$0.0001 par value per share	44,355,195 (3)	\$ 0.085	\$3,770,191.58	\$ 432.06
Common Stock, \$0.0001 par value per share	1,000,000 (3)	\$ 0.073	\$ 73,000.00	\$ 8.37
Common Stock, \$0.0001 par value per share	1,000,000 (3)	\$ 0.082	\$ 82,000.00	\$ 9.40
Common Stock, \$0.0001 par value per share	500,000 (3)	\$ 0.160	\$ 80,000.00	\$ 9.17
Common Stock, \$0.0001 par value per share	250,000 (3)	\$ 0.130	\$ 32,500.00	\$ 3.72
Totals	90,000,000		\$9,247,887.36	\$1,059.81

- (1) Pursuant to Rule 416(a) under the Securities Act of 1933, this Registration Statement also covers such additional shares of Common Stock as may be issued to prevent dilution from stock splits, stock dividends and similar transactions.
- (2) Consists of shares reserved for issuance under the RXi Pharmaceuticals Corporation 2012 Long Term Incentive Plan (the "Plan").
- (3) Consists of shares subject to option awards outstanding under the Plan.
- (4) Offering prices of options that have not yet been granted as of the date of this Registration Statement are computed in accordance with Rule 457(h) of the Securities Act, as amended, based on the average high and low prices of the Common Stock as reported by the OTC Markets Group on August 29, 2012 to be \$0.120 and \$0.112, respectively.

PART I

Information required by Part I to be contained in the Section 10(a) prospectus is omitted from this Registration Statement in accordance with Rule 428 under the Securities Act of 1933, as amended (the "Securities Act"), and the Note to Part I of Form S-8.

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Documents by Reference.

The following documents filed by the Registrant with the Commission are incorporated herein by reference:

- (a) the Registrant's special financial report on Form 10-K for the fiscal year ended December 31, 2011;
- (b) the Registrant's quarterly reports for the quarters ended March 31, 2012 and June 30, 2012; and
- (c) the Registrant's Current Reports on Form 8-K, filed with the Securities and Exchange Commission (the "SEC") on April 10, 2012, April 16, 2012, April 19, 2012, May 3, 2012, June 22 and July 3, 2012.

All documents subsequently filed by the Registrant pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Securities Exchange Act of 1934, prior to the filing of a post-effective amendment to this Registration Statement that indicates that all securities offered have been sold or which deregisters all securities then remaining unsold, shall be deemed to be incorporated herein by reference from the date of filing of such documents. Any statement contained herein or in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this Registration Statement to the extent that a statement contained herein or in any subsequently filed document which also is incorporated or is deemed to be incorporated by reference herein modifies or supersedes such earlier statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute part of this Registration Statement.

Item 4. Description of Securities.

Authorized Capital Stock

Our authorized capital stock consists of 1,500,000,000 shares of common stock, par value \$0.0001 per share, and 10,000,000 shares of preferred stock, par value \$0.0001 per share, of which 15,000 shares are designated as Series A Convertible Preferred Stock ("Series A Preferred Stock"). As of August 30, 2012, 157,500,191 shares of our common stock were outstanding, assuming no exercise of stock options or Series A Preferred Stock, and 9,410 shares of our Series A Preferred Stock were outstanding.

Common Stock

The holders of our common stock are entitled to one vote for each share on all matters voted on by stockholders, including elections of directors, and, except as otherwise required by law or provided in any resolution adopted by our board with respect to any series of preferred stock, the holders of such shares will possess all voting power. Our certificate of incorporation does not provide for cumulative voting in the election of directors. The shares of common stock have no conversion rights or sinking fund provisions and are not liable for further call or assessment. Subject to any preferential rights of any outstanding series of our preferred stock created by our board from time to time, the holders of common stock are entitled to such dividends as may be declared from time to time by our board from funds available therefor and upon liquidation are entitled to receive pro rata all assets available for distribution to such holders. Our common stock is not redeemable.

The holders of our common stock, other than Galena Biopharma, Inc. ("Galena"), our former parent company, have no preemptive rights. For any offering and sale of our securities that are sold in a capital raising

transaction within one year following the completion of our spin-off from Galena, Galena is entitled to preemptive rights to participate (to the extent permitted under the Securities Act of 1933) in each such subsequent offering. Pursuant to this preemptive right, Galena is entitled to purchase a portion of the securities offered in each subsequent offering equal to Galena's percentage ownership in our common stock, determined on an as-converted, fully diluted basis, immediately prior to the consummation of such subsequent offering.

The rights, preferences and privileges of holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock which we may designate and issue in the future.

Our certificate of incorporation includes a provision permitting our board of directors to effect up to two reverse splits of our common stock, without the further approval of our common stockholders through July 24, 2012. If we implement a reverse stock split, the number of shares of our common stock held by each stockholder would be reduced by multiplying the number of shares held immediately before the reverse stock split by the appropriate ratio and then rounding down to the nearest whole share. We would then pay cash to each stockholder in lieu of any fractional interest in a share to which each stockholder would otherwise be entitled as a result of the reverse stock split. The reverse stock split would not affect any stockholder's percentage ownership interest or proportionate voting power, except to the extent that interests in fractional shares are paid in cash, and the rights pertaining to the outstanding shares of our common stock would be unchanged after the reverse stock split. Moreover, because the number of shares of authorized common stock would not be affected, a reverse stock split would result in an increase in the authorized, but unissued, shares of common stock as a percentage of total authorized shares. Each share of our common stock issued following a reverse stock split would be fully paid and non-assessable.

In addition to adjusting the number of shares of our common stock, in the event of a reverse stock split, we would adjust any options, warrants and preferred stock in accordance with the terms of these securities.

Preferred Stock

We are authorized to issue up to 10,000,000 shares of preferred stock, par value \$0.0001 per share. Our board of directors, without further action by the holders of our common stock, may issue shares of our preferred stock in one or more series. Our board is vested with the authority to fix by resolution the designations, preferences and relative, participating, optional or other special rights, and such qualifications, limitations or restrictions thereof, including, without limitation, redemption rights, dividend rights, liquidation preferences and conversion or exchange rights of any class or series of preferred stock, and to fix the number of classes or series of preferred stock, the number of shares constituting any such class or series and the voting powers for each class or series. The authority possessed by our board to issue preferred stock could potentially be used to discourage attempts by third parties to obtain control of us through a merger, tender offer, proxy contest or otherwise by making such attempts more difficult or more costly. Our board may issue preferred stock with voting rights or conversion rights that, if exercised, could adversely affect the voting power of the holders of common stock. There are no current agreements or understandings with respect to the issuance of preferred stock and our board has no present intention to issue any additional shares of preferred stock.

Series A Preferred Stock

Our Series A Preferred Stock has a face value of \$1,000 per share and will accrue dividends at a rate of 7% per annum from the date of issuance through the date of conversion or redemption, payable quarterly in shares of Series A Preferred Stock.

The holders of Series A Preferred Stock do not have any right to elect directors and have only limited voting rights, which consist primarily of the right to vote under certain protective provisions set forth in the Series A Preferred Stock Certificate of Designations (the "Certificate of Designations"), regarding: (i) any proposed amendment to the Series A Preferred Stock or its right and preferences or any reverse split or recapitalization of the common stock; and (ii) any proposed "Deemed Liquidation Event" as defined in the Certificate of Designations.

The Series A Preferred Stock is convertible by a holder at any time into shares of RXi common stock. The Series A Preferred Stock will convert into RXi common stock at a rate of 73,127 shares per \$1,000 of face value to be converted. The conversion rate will be adjusted for certain events, such as stock splits, stock dividends,

reclassifications and recapitalizations, and is subject to full-ratchet anti-dilution protection such that any subsequent issuance of common stock at a price, or in the case of common stock equivalents, at an effective conversion price, below the effective conversion price of the Series A Preferred Stock at the time of such issuance automatically adjusts the conversion price of the Series A Preferred Stock to such lower price. A holder of Series A Preferred Stock may not convert its preferred stock to common stock if such conversion would result in the holder beneficially owning more than 9.999% of our then-issued and outstanding shares of common stock. This limitation on conversion may not be waived.

Upon a Liquidation Event (as defined in the Certificate of Designations), no other class or series of capital stock can receive any payment unless the Series A Preferred Stock has first received a payment in an amount equal to \$1,000 per share, plus all accrued and unpaid dividends, if applicable.

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

Certificate of Incorporation and Bylaw Provisions. Our certificate of incorporation and bylaws include a number of provisions that may have the effect of encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our board of directors rather than pursue non-negotiated takeover attempts. They are intended to enhance our long-term value to our stockholders by increasing the likelihood of continued stability in the composition of our board of directors and its policies and discouraging certain types of transactions that may involve an actual or threatened acquisition of us. These provisions are also designed to reduce our vulnerability to an unsolicited acquisition proposal and to discourage certain tactics that may be used in proxy fights. However, such provisions could have the effect of discouraging others from making tender offers for our shares and, as a consequence, they also may inhibit fluctuations in the market price of our stock that could result from actual or rumored takeover attempts. These provisions include the items described below.

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

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

Meetings of Stockholders. Our certificate of incorporation provides that only our board of directors or holders of 5% or more of our outstanding shares of common stock may call special meetings of stockholders and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders. Our bylaws limit the business that may be conducted at an annual meeting of stockholders to those matters properly brought before the meeting.

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

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

Blank Check Preferred Stock. Our certificate of incorporation provides for 10,000,000 authorized shares of preferred stock, of which 15,000 shares are designated as Series A Preferred Stock. The existence of authorized but

unissued shares of preferred stock may enable our board of directors to render more difficult or to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest, or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of our company or our stockholders, our board of directors could cause shares of preferred stock to be issued without stockholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer or insurgent stockholder or stockholder group. In this regard, our certificate of incorporation grants our board of directors broad power to establish the rights and preferences of authorized and unissued shares of preferred stock. The issuance of shares of preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of common stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring, or preventing a change of control of us.

Delaware Business Combination Statute

Section 203 of the DGCL provides that, subject to exceptions set forth therein, an interested stockholder of a Delaware corporation shall not engage in any business combination, including mergers or consolidations or acquisitions of additional shares of the corporation, with the corporation for a three-year period following the date that such stockholder becomes an interested stockholder unless:

- Prior to such date, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- Upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, other than statutorily excluded shares; or
- On or subsequent to such date, the business combination is approved by the board of directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least 66-2/3% of the outstanding voting stock which is not owned by the interested stockholder.

Except as otherwise set forth in Section 203, an interested stockholder is defined to include:

- Any person that is the owner of 15% or more of the outstanding voting stock of the corporation, or is an affiliate or associate of the corporation and was the owner of 15% or more of the outstanding voting stock of the corporation at any time within three years immediately prior to the date of determination; and
- The affiliates and associates of any such person.

The restrictions contained in Section 203 are not applicable to any of our existing stockholders that will own 15% or more of our outstanding common stock.

Section 203 may make it more difficult for a person who would be an interested stockholder to effect various business combinations with a corporation for a three-year period. We have not elected to be exempt from the restrictions imposed under Section 203. The provisions of Section 203 may encourage persons interested in acquiring us to negotiate in advance with our board, since the stockholder approval requirement would be avoided if a majority of the directors then in office approves either the business combination or the transaction which results in any such person becoming an interested stockholder. Such provisions also may have the effect of preventing changes in our management. It is possible that such provisions could make it more difficult to accomplish transactions, which our stockholders may otherwise deem to be in their best interests.

Transfer Agent and Registrar

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

Item 5. Interests of Named Experts and Counsel.

Not applicable.

Item 6. Indemnification of Directors and Officers.

Section 145 of the DGCL provides that a corporation may indemnify any current or former director, officer or employee or other individual against expenses, judgments, fines and amounts paid in settlement in connection with civil, criminal, administrative or investigative actions or proceedings, other than a derivative action by or in the right of the corporation, if the director, officer, employee or other individual acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, if he or she had no reasonable cause to believe his or her conduct was unlawful. A similar standard is applicable in the case of derivative actions, except that indemnification extends only to expenses incurred in connection with the defense or settlement of such actions, and the statute requires court approval before there can be any indemnification where the person seeking indemnification has been found liable to the corporation. The statute provides that it is not exclusive of other indemnification that may be granted by a corporation's by-laws, disinterested director vote, stockholder vote, agreement or otherwise.

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 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 intend to 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 7. Exemption From Registration Claimed.

Not applicable.

Item 8. Exhibits.

See the Exhibit Index following the signature page.

Item 9. Undertakings.

- (a) The undersigned Registrant hereby undertakes:
- (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this Registration Statement:
 - (i) To include any prospectus required by Section 10(a)(3) of the Securities Act;
 - (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 a prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective Registration Statement;
 - (iii) To include any material information with respect to the plan of distribution not previously disclosed in the Registration Statement or any material change to such information in the Registration Statement;
provided, however, that paragraphs (a)(1)(i) and (a)(1)(ii) above shall 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.
 - (2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.
 - (3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.
- (b) The undersigned Registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the Registrant's annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) 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.

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- (c) Insofar as indemnification for liabilities arising under the Securities 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 SEC such indemnification is against public policy as expressed in the Securities 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 Securities Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Westborough, Commonwealth of Massachusetts, on this 30th day of August, 2012.

RXi PHARMACEUTICALS CORPORATION

By: /s/ Geert Cauwenbergh

Name: Geert Cauwenbergh, Dr. Med. Sc.

Title: President, Chief Executive Officer and
Chief Financial Officer

POWER OF ATTORNEY

Each person whose signature appears below constitutes and appoints Geert Cauwenbergh and Caitlin Kontulis, and each of them acting individually, as his or her true and lawful attorneys-in-fact and agents with full power of each to act alone, with full powers of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Registration Statement on Form S-8 to be filed by RXi Pharmaceuticals Corporation, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, with full power of each to act alone, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully for all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or his, her or their substitutes, may lawfully do or cause to be done by virtue hereof.

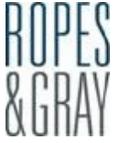
* * * *

Pursuant to the requirements of the Securities Act of 1933, as amended, 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 and Chief Financial Officer and Director <i>(Principal Executive Officer and Principal Financial Officer)</i>	August 30, 2012
<u>/s/ Caitlin Kontulis</u> Caitlin Kontulis	Controller and Secretary <i>(Principal Accounting Officer)</i>	August 30, 2012
<u>/s/ Keith L. Brownlie</u> Keith L. Brownlie	Director	August 30, 2012
<u>/s/ Robert J. Bitterman</u> Robert J. Bitterman	Director	August 30, 2012

EXHIBIT INDEX

- 3.1 Amended and Restated Certificate of Incorporation of RXi Pharmaceuticals Corporation (previously filed with Amendment No. 3 the Registration Statement on Form S-1 (File No. 333-177498) and incorporated herein by reference).
- 3.2 Second Amended and Restated Bylaws of RXi Pharmaceuticals Corporation (previously filed with the Quarterly Report on Form 10-Q for the quarter ended June 30, 2012 (File No. 333-177498) and incorporated herein by reference).
- 5.1 Opinion of Ropes & Gray LLP.
- 23.1 Consent of BDO USA LLP.
- 23.2 Consent of Ropes & Gray LLP (included in the opinion filed as Exhibit 5.1).
- 24.1 Powers of Attorney (included on the signature page).
- 99.1 RXi Pharmaceuticals Corporation 2012 Long Term Incentive Plan (previously filed with Amendment No. 3 the Registration Statement on Form S-1 (File No. 333-177498) and incorporated herein by reference).
- 99.2 Form of Incentive Stock Option Award (previously filed with Amendment No. 3 the Registration Statement on Form S-1 (File No. 333-177498) and incorporated herein by reference).
- 99.3 Form of Non-qualified Stock Option Award (previously filed with Amendment No. 2 the Registration Statement on Form S-1 (File No. 333-177498) and incorporated herein by reference).
- 99.4 Form of Restricted Stock Unit Award (previously filed with Amendment No. 2 the Registration Statement on Form S-1 (File No. 333-177498) and incorporated herein by reference).



ROPES & GRAY LLP
THREE EMBARCADERO CENTER
SAN FRANCISCO, CA 94111-4006
WWW.ROPESGRAY.COM

August 30, 2012

RXi Pharmaceuticals Corporation
1500 West Park Drive, Suite 210
Westborough, MA 01581

Ladies and Gentlemen:

This opinion letter is furnished to you in connection with the registration statement on Form S-8 (the "Registration Statement"), filed with the Securities and Exchange Commission under the Securities Act of 1933, as amended, for the registration of 90,000,000 shares of Common Stock, \$0.0001 par value (the "Shares"), of RXi Pharmaceuticals Corporation, a Delaware corporation (the "Company"). The Shares are issuable under the Company's 2012 Long Term Incentive Plan (the "Plan").

We are familiar with the actions taken by the Company in connection with the adoption of the Plan and the authorization of the Shares for issuance under the Plan. For purposes of our opinion, we have examined and relied upon such documents, records, certificates and other instruments as we have deemed necessary. The opinions expressed below are limited to the Delaware General Corporation Law.

For purposes of the opinion expressed below, we have assumed that a sufficient number of authorized but unissued shares of the Company's Common Stock will be available for issuance when the Shares are issued.

Subject to the foregoing, we are of the opinion that the Shares have been duly authorized and, when the Shares have been issued and sold in accordance with the terms of the Plan, the Shares will be validly issued, fully paid and non-assessable.

We hereby consent to the filing of this opinion letter as an exhibit to the Registration Statement. Our consent shall not be deemed an admission that we are experts whose consent is required under Section 7 of the Securities Act of 1933 or the rules and regulations of the Securities and Exchange Commission thereunder.

Very truly yours,

/s/ Ropes & Gray LLP

Ropes & Gray LLP

Consent of Independent Registered Public Accounting Firm

RXi Pharmaceuticals Corporation
Westborough, MA

We hereby consent to the incorporation by reference in the Prospectus constituting a part of this Registration Statement of our report dated May 7, 2012, relating to the financial statements of RXi Pharmaceuticals Corporation (the "Company") appearing in the Company's Special Report on Form 10-K for the year ended December 31, 2011.

/s/BDO USA, LLP

Boston, MA
August 30, 2012