

Marlborough, Massachusetts 01752

(508) 767-3861

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

RXi Pharmaceuticals Corporation 2012 Long Term Incentive Plan

RXi Pharmaceuticals Corporation Employee Stock Purchase Plan

(Full Title of the Plan)

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.

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)	Proposed maximum offering price per share (2)	Proposed maximum aggregate offering Price (2)	Amount of registration fee
Common Stock, par value \$0.0001 per share (“Common Stock”), to be issued under the RXi Pharmaceuticals Corporation 2012 Long Term Incentive Plan	625,000	\$1.495	\$934,375.00	\$116.33
Common Stock to be issued under the RXi Pharmaceuticals Corporation Employee Stock Purchase Plan	400,000	\$1.495	598,000.00	74.45
Total	1,025,000		\$1,532,375.00	\$190.78

Pursuant to Rule 416(a) under the Securities Act of 1933, as amended, this Registration Statement also covers such additional shares of Common Stock as may be issued under the RXi Pharmaceuticals Corporation 2012 Long Term Incentive Plan (the “**2012 LTIP**”) and the RXi Pharmaceuticals Employee Stock Purchase Plan (the “**ESPP**”) to prevent dilution from stock splits, stock dividends and similar transactions.

Calculated pursuant to Rule 457(h) of the Securities Act of 1933, as amended, solely for the purpose of computing the amount of the registration fee, on the basis of the average of the high and low prices of the registrant’s Common Stock quoted on The Nasdaq Capital Market on August 20, 2018.

**INCORPORATION OF CERTAIN INFORMATION BY REFERENCE
PURSUANT TO GENERAL INSTRUCTION E OF FORM S-8**

This Registration Statement has been filed by RXi Pharmaceuticals Corporation (the “**Registrant**”) to register 625,000 additional shares of Common Stock to be offered pursuant to the 2012 LTIP. Pursuant to Instruction E to Form S-8, the Registrant incorporates by reference the Registration Statements on Form S-8 filed with the Securities and Exchange Commission on August 30, 2012 (File No. 333-183633), June 21, 2013 (File No. 333-189522) and February 2, 2017 (File No. 333-215870), together with all exhibits filed therewith or incorporated herein by reference.

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This Registration Statement has been filed by the Registrant to register 400,000 additional shares of Common Stock to be offered pursuant to the ESPP. Pursuant to Instruction E to Form S-8, the Registrant incorporates by reference the Registration Statements on Form S-8 filed on June 21, 2013 (File No. 333-189521) and February 2, 2017 (File No. 333-215871) filed with the Securities and Exchange Commission, together with all exhibits filed therewith or incorporated herein by reference.

Item 8.

Exhibits

Exhibit Number	Description	Incorporated by Reference Herein Form	Date
5.1	<u>Opinion of Gibson, Dunn & Crutcher LLP.*</u>		
23.1	Consent of Gibson, Dunn & Crutcher LLP (included in Exhibit 5.1). *		
23.2	<u>Consent of BDO USA, LLP, Independent Registered Public Accounting Firm.*</u>		
24.1	<u>Powers of Attorney.*</u>	Included on the signature page of this Registration Statement on Form S-8	
99.1	<u>RXi Pharmaceuticals Corporation 2012 Long Term Incentive Plan.*</u>		
99.2	<u>RXi Pharmaceuticals Corporation Employee Stock Purchase Plan.*</u>		

* Filed herewith.

Signatures

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant certifies that it has reasonable grounds to believe that it meets all 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 Marlborough, Massachusetts, on August 24, 2018.

RXi PHARMACEUTICALS CORPORATION

By: /s/ Geert Cauwenbergh
Geert Cauwenbergh, Dr. Med. Sc.
President, Chief Executive Officer and acting 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 and agent, with full power of substitution and resubstitution, in any and all capacities, to sign any and all amendments (including 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, granting unto said attorney-in-fact and agent, with full power 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 might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, 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.

Signature	Title	Date
/s/ Geert Cauwenbergh	President, Chief Executive Officer,	August 24, 2018
Geert Cauwenbergh, Dr. Med. Sc.	Acting Chief Financial Officer and Director	

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(Principal Executive Officer and

Principal Financial Officer)

/s/ Caitlin Kontulis	Senior Director of Finance and Secretary	August 24, 2018
Caitlin Kontulis	(Principal Accounting Officer)	
/s/ Robert J. Bitterman	Director	August 24, 2018
Robert J. Bitterman		
/s/ Keith L. Brownlie	Director	August 24, 2018
Keith L. Brownlie		
/s/ H. Paul Dorman	Director	August 24, 2018
H. Paul Dorman		
/s/ Jonathan E. Freeman	Director	August 24, 2018
Jonathan E. Freeman, Ph.D.		
/s/ Curtis A. Lockshin	Director	August 24, 2018
Curtis A. Lockshin, Ph.D.		