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

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**FORM 8-K**

**CURRENT REPORT  
PURSUANT TO SECTION 13 OR 15(D) OF THE  
THE SECURITIES EXCHANGE ACT OF 1934**

Date of report (Date of earliest event reported): August 14, 2009

**RXI PHARMACEUTICALS CORPORATION**

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of  
of incorporation or organization)

001-33958

(Commission  
File Number)

20-8099512

(I.R.S. Employer  
Identification No.)

60 Prescott Street, Worcester, MA 01605

(Address of Principal Executive Offices) (Zip Code)

Registrant's telephone number, including area code: (508) 767-3861

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions ( *see* General Instruction A.2. below):

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
  - Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
  - Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
  - Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
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Signature

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Press Release dated August 14, 2009

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### **Item 2.02 Results of Operations and Financial Condition.**

On August 14, 2009, RXi Pharmaceuticals Corporation issued a press release announcing its financial results for the second quarter ended June 30, 2009 a copy of which is attached as Exhibit 99.1 to this Current Report and incorporated herein by reference.

The information being furnished under Item 2.02 in this Form 8-K, including the accompanying exhibits, shall not be deemed to be “filed” for the purposes of Section 18 of the Securities and Exchange Act of 1934 (the “Exchange Act”), or otherwise subject to the liability of such section, nor shall such information be deemed incorporated by reference in any filing under the Securities Act of 1933 or the Exchange Act, regardless of the general incorporation language of such filing, except as shall be expressly set forth by specific reference in such filing.

### **Item 9.01 Financial Statements and Exhibits.**

#### (d) Exhibits

99.1 Press Release issued by RXi Pharmaceuticals Corporation on August 14, 2009.

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### Signature

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

RXI PHARMACEUTICALS CORPORATION

Date: August 17, 2009

By: /s/ Stephen J. DiPalma

Name: Stephen J. DiPalma

Title: Chief Financial Officer

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**Index to Exhibits**

<b>Exhibit No.</b>	<b>Description</b>
99.1	Press Release issued by RXi Pharmaceuticals Corporation on August 14, 2009.

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### RXi Pharmaceuticals Reports Financial Results for the Second Quarter of 2009

**Worcester, MA, August 14, 2009** — RXi Pharmaceuticals Corporation (Nasdaq: RXII), a biopharmaceutical company pursuing the development and commercialization of proprietary therapeutics based on RNA interference (RNAi), today reported results for the quarter ended June 30, 2009.

Tod Woolf, Ph.D., President and Chief Executive Officer of RXi, commented, “RXi continues to make significant progress on its RNAi therapeutic platform with advances in research that have the potential to address multiple large therapeutic markets with unmet medical needs. With the financing that we recently closed, the Company is well positioned to continue its research with cutting-edge RNAi technologies and therapeutic developmental programs, continuing its leadership position in the RNAi therapeutics field.”

#### Corporate Highlights:

- RXi exercised its option to an exclusive worldwide license to proprietary self-delivery RNAi technology from Advirna LLC — RXi’s assessment of this novel technology indicated that it could enable the delivery of RNAi molecules to cells spontaneously upon direct administration, both *in vitro* and *in vivo*, without requiring a delivery vehicle or transfection formulation. The ability to create self-delivering RNAi therapeutics may potentially provide significant competitive advantages in efficacy, toxicity, ease of administration and manufacturing cost. RXi has integrated this technology into its comprehensive delivery platform to develop a sustainable pipeline of products for unmet medical needs.
- \$8 Million Public Offering — RXi raised \$8 million in a public offering to institutional investors that will be used for working capital and for general corporate purposes.

#### Scientific Achievements:

RXi presented data at various key scientific conferences this quarter.

- Data on self-delivering rxRNA (sd-rxRNA™) was presented at the TIDES Oligonucleotide and Peptide® Technology and Product Development Conference and IBC’s Drug Discovery and Development conference.
  - Promising pre-clinical results from our self-delivering rxRNA (sd-rxRNA™) were presented demonstrating that sd-rxRNA promotes spontaneous cellular uptake of RNAi therapeutics *in vitro*. In addition, RXi presented *in vivo* data that demonstrates that sd-rxRNAs not only enter liver cells (hepatocytes) spontaneously, but also that sd-rxRNAs significantly improve the biodistribution of RNAi compounds to the liver. This positive data demonstrate the potential utility of RXi’s sd-rxRNA™ compounds for both local and subcutaneous administration, which could allow a broad range of new areas of RNAi therapeutic development.
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### *Financial Highlights:*

The Company reported a net loss of \$9.3 million, or \$0.67 per share, for the six months ended June 30, 2009, compared to a net loss of \$7.0 million, or \$0.55 per share, for the same period in 2008. The Company had 13,821,910 common shares outstanding at June 30, 2009, as compared to 13,763,231 common shares outstanding at June 30, 2008.

Research and development expenses for the six months ended June 30, 2009 were \$4.4 million, including approximately \$1.4 million in stock based compensation, compared to \$3.9 million including \$1.7 million in stock-based compensation, for the six months ended June 30, 2008. The increase of approximately \$0.5 million, or 12.8%, was primarily due to higher staff-related costs resulting from growth in R&D staff and increased patent application and prosecution expenses, coupled with a decrease of approximately \$0.2 million in stock-based compensation. General and administrative expenses for the six months ended June 30, 2009 were \$4.8 million, including \$0.9 million in stock based compensation, compared to \$3.2 million, including \$0.8 million in stock based compensation, for the six months ended June 30, 2008. The increase of \$1.6 million, or 50.0%, was primarily due to non-cash expense totaling \$1.1 million associated with warrants issued for business advisory services and common stock issued pursuant to Standby Equity Distribution Agreement (SEDA) that the Company entered into in January 2009.

As of June 30, 2009, cash and cash equivalents totaled \$4.4 million, compared to cash and cash equivalents of \$9.9 million at December 31, 2008. This decrease is due to cash used in operations of \$5.5 million for the six months ended June 30, 2009. On July 31, 2009 the Company entered into a definitive agreement for the purchase of 2,385,715 shares of its common stock at \$3.50 per share, and warrants to purchase up to 954,286 shares of common stock at an exercise price of \$4.50 per share which will be exercisable beginning on February 4, 2010. The offering closed on August 4, 2009. The Company received approximately \$7.8 million in net proceeds from the offering. Proceeds from the transaction will be used to meet working capital needs and for general corporate purposes.

### **About RXi Pharmaceuticals Corporation**

RXi Pharmaceuticals is a discovery-stage biopharmaceutical company pursuing the development and potential commercialization of proprietary therapeutics based on RNA interference (RNAi) for the treatment of human diseases. RXi Pharmaceuticals has a comprehensive RNAi platform that includes both RNAi compounds and delivery methods. RXi Pharmaceuticals' rxRNA™ compounds are distinct from the siRNA compounds used by many other companies developing RNAi therapeutics and are very active and potent (10-100 pM activity in cell culture) based on the company's internal research, in addition to being nuclease resistant and readily manufactured. RXi Pharmaceuticals believes it is well positioned to compete successfully in the RNAi-based therapeutics market with its accomplished scientific advisors, including Dr. Craig Mello, recipient of the 2006 Nobel Prize for his co-discovery of RNAi; a management team that is experienced in developing RNAi products; and a strong early intellectual property position in RNAi chemistry and delivery. [www.rxipharma.com](http://www.rxipharma.com)

### **Forward-Looking Statements**

This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Such statements include, but are not limited to, statements about future expectations, plan and future development of RXi Pharmaceutical Corporation's products and technologies. These forward-looking statements about future expectations, plans and prospects of the

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development of RXi Pharmaceutical Corporation's products and technologies involve significant risks, uncertainties and assumptions, including the risk of delays in satisfying the conditions to selling any of the securities to YA Global Investments pursuant to the Standby Equity Distribution Agreement that we have in place with them and the potential adverse impact on the market price of our securities due to resale by YA Global Investments of securities purchased from the Company if the Company sells them securities, the risk that the proceeds from the recently completed securities offering will be insufficient to meet all of the capital needed to support our operations, the risk that pre-clinical results of our oral delivery technology obtained to date may not be reproducible in subsequent pre-clinical or clinical trials, the risk that unanticipated safety or efficacy issues may arise in the course of developing our oral delivery technology, the risk that the development of our RNAi-based therapeutics may be delayed or may not proceed as planned and we may not be able to complete development of any RNAi-based product, the risk that the FDA approval process may be delayed for any drugs that we develop, risks related to development and commercialization of products by our competitors, risks related to our ability to control the timing and terms of collaborations with third parties *and* the possibility that other companies or organizations may assert patent rights that prevent us from developing our products. Actual results may differ materially from those RXi Pharmaceuticals Corporation contemplated by these forward-looking statements. RXi Pharmaceuticals Corporation 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 release.

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RXi Pharmaceuticals Corporation  
(A Development Stage Company)  
Condensed Statements of Expenses  
(in thousands, except share and per share data)  
(Unaudited)

	For the Three Months Ended June 30, 2009	For the Three Months Ended June 30, 2008	For the Six Months Ended June 30, 2009	For the Six Months Ended June 30, 2008
Research and development expense	\$ 3,026	\$ 2,766	\$ 4,442	\$ 3,854
General and administrative expense	2,049	1,580	4,804	3,213
Operating loss	(5,075)	(4,346)	(9,246)	(7,067)
Other income (expense), net	(6)	28	(6)	103
Net loss	<u>\$ (5,081)</u>	<u>\$ (4,318)</u>	<u>\$ (9,252)</u>	<u>\$ (6,964)</u>
Net loss per common share:				
Basic and diluted loss per share	<u>\$ (0.37)</u>	<u>\$ (0.34)</u>	<u>\$ (0.67)</u>	<u>\$ (0.55)</u>
Weighted average common shares outstanding:				
Basic and diluted	<u>13,812,817</u>	<u>12,743,404</u>	<u>13,812,367</u>	<u>12,713,918</u>

RXi Pharmaceuticals Corporation  
(A Development Stage Company)  
Condensed Balance Sheets  
(in thousands, except share and per share data)  
(Unaudited)

	June 30, 2009	December 31, 2008
Cash and cash equivalents	\$ 4,362	\$ 9,856
Prepaid expenses and other current assets	333	73
Equipment and furnishings, net	391	414
Deposits	<u>16</u>	<u>16</u>
Total assets	<u>\$ 5,102</u>	<u>\$ 10,359</u>
Accounts payable	\$ 580	\$ 394
Accrued expense and other current liabilities	1,274	976
Current maturities of capital lease obligations	14	17
Total current liabilities	1,868	1,387
Capital lease obligations, net of current maturities	<u>11</u>	<u>4</u>
Total liabilities	1,879	1,391
Total stockholders' equity	<u>3,223</u>	<u>8,968</u>
Total liabilities and stockholders' equity	<u>\$ 5,102</u>	<u>\$ 10,359</u>

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