

SECURITIES AND EXCHANGE COMMISSION

FORM SC 13G

Schedule filed to report acquisition of beneficial ownership of 5% or more of a class of equity securities by passive investors and certain institutions

Filing Date: **2009-01-26**
SEC Accession No. **0000950134-09-001014**

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SUBJECT COMPANY

RXI PHARMACEUTICALS CORP

CIK: **1390478** | IRS No.: **000000000**
Type: **SC 13G** | Act: **34** | File No.: **005-84090** | Film No.: **09545367**
SIC: **2834** Pharmaceutical preparations

Mailing Address
*60 PRESCOTT STREET
WORCESTER MA 01605*

Business Address
*60 PRESCOTT STREET
WORCESTER MA 01605
508-767-3861*

FILED BY

CYTRX CORP

CIK: **799698** | IRS No.: **581642750** | State of Incorporation: **DE** | Fiscal Year End: **1231**
Type: **SC 13G**
SIC: **2836** Biological products, (no diagnostic substances)

Mailing Address
*11726 SAN VICENTE
BOULEVARD
SUITE 650
LOS ANGELES CA 90049*

Business Address
*11726 SAN VICENTE
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OMB APPROVAL
OMB Number: 3235-0145
Expires: February 28, 2009
Estimated average burden hours per response...10.4

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

SCHEDULE 13G

(Rule 13d-102)

**INFORMATION TO BE INCLUDED IN STATEMENT FILED PURSUANT
TO RULES 13d-1(b), (c), AND (d) AND AMENDMENTS THERETO
FILED PURSUANT TO RULE 13d-2**

(Amendment No. ____)

RXi Pharmaceuticals Corporation

(Name of Issuer)

Common Stock, \$0.0001 par value per share

(Title of Class of Securities)

74978T109

(CUSIP Number)

December 31, 2008

(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

- Rule 13d-1(b)
- Rule 13d-1(c)
- Rule 13d-1(d)

* The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter the disclosures provided in a prior cover page.

The information required in the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).



1	NAMES OF REPORTING PERSONS CytRx Corporation I.R.S. IDENTIFICATION NO. OF ABOVE PERSON (Entities Only) 58-1642740	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (SEE INSTRUCTIONS) (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	5	SOLE VOTING POWER 6,268,881
	6	SHARED VOTING POWER 0
	7	SOLE DISPOSITIVE POWER 6,268,881
	8	SHARED DISPOSITIVE POWER 0
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON	
10	CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (SEE INSTRUCTIONS) <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 45.5%	
12	TYPE OF REPORTING PERSON (SEE INSTRUCTIONS) CO	

Item 1(a). Name of Issuer.

The name of the issuer is RXi Pharmaceuticals Corporation (the "Issuer").

Item 1(b). Address of Issuer's Principal Executive Offices.

The address of the Issuer's principal executive office is 60 Prescott Street, Worcester, Massachusetts 01605.

Item 2(a). Name of Person Filing.

CytRx Corporation ("CytRx" or the "Reporting Person").

Item 2(b). Address of Principal Business Office, or, if None, Residence.

The business address of CytRx is 11726 San Vicente Boulevard, Suite 650, Los Angeles, California.

Item 2(c). Citizenship.

CytRx is a Delaware corporation.

Item 2(d). Title of Class of Securities.

The title of the class of securities to which this statement relates is the common stock of the Issuer, \$0.0001 par value per share (the "Common Stock").

Item 2(e). CUSIP No.

The CUSIP number is 74978T109.

Item 3. If This Statement is Filed Pursuant to Rule 13d-1(b) or 13d-2(b), Check Whether the Person Filing is a:

- (a) Broker or dealer registered under Section 15 of the Act
 - (b) Bank as defined in Section 3(a)(6) of the Act
 - (c) Insurance Company as defined in Section 3(a)(19) of the Act
 - (d) Investment Company registered under Section 8 of the Investment Company Act of 1940
 - (e) Investment Adviser registered under section 203 of the Investment Advisers Act of 1940
 - (f) Employee Benefit Plan, Pension Fund which is subject to the provisions of the Employee Retirement Income Security Act of 1974 or Endowment Fund; see Rule 13d-1(b)(1)(ii)(F)
 - (g) Parent Holding Company, in accordance with Rule 13d-1(b)(1)(ii)(G) (Note: See Item 7)
 - (h) Group, in accordance with Rule 13d-1(b)(1)(ii)(H).
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Item 4. Ownership.

The information required by Items 4(a) – (c) is set forth in Rows 5 – 11 of the cover page and is incorporated herein by reference.

As of December 31, 2008, CytRx was the beneficial owner of 6,268,881 shares of Common Stock, which represents approximately 45.5% of the shares of Common Stock outstanding as reported in the Issuer's most recent Form 10-Q. CytRx has the sole power to vote, or to direct the vote of, and to dispose of, or to direct the disposition of, these shares.

Item 5. Ownership of Five Percent or Less of a Class.

If this Schedule is being filed to report the fact that as of the date hereof the Reporting Person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following .

Item 6. Ownership of More than Five Percent on Behalf of Another Person.

Not Applicable.

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on by the Parent Holding Company.

Not Applicable.

Item 8. Identification and Classification of Members of the Group.

Not Applicable.

Item 9. Notice of Dissolution of Group.

Not Applicable.

Item 10. Certifications.

Not applicable.

SIGNATURE

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

Dated: January 26, 2009

CYTRX CORPORATION

By: /s/ Steven A. Kriegsman
Name: Steven A. Kriegsman
Title: Chief Executive Officer