

RXI PHARMACEUTICALS CORP
 Form 4
 September 25, 2009

FORM 4 UNITED STATES SECURITIES AND EXCHANGE COMMISSION
 Washington, D.C. 20549

OMB APPROVAL

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Check this box if no longer subject to Section 16. Form 4 or Form 5 obligations may continue. See Instruction 1(b).

STATEMENT OF CHANGES IN BENEFICIAL OWNERSHIP OF SECURITIES

Filed pursuant to Section 16(a) of the Securities Exchange Act of 1934, Section 17(a) of the Public Utility Holding Company Act of 1935 or Section 30(h) of the Investment Company Act of 1940

(Print or Type Responses)

1. Name and Address of Reporting Person *
 CYTRX CORP

2. Issuer Name and Ticker or Trading Symbol
 RXI PHARMACEUTICALS CORP
 [RXii]

5. Relationship of Reporting Person(s) to Issuer
 (Check all applicable)

(Last) (First) (Middle)
 11726 SAN VICENTE
 BOULEVARD, SUITE 650
 (Street)

3. Date of Earliest Transaction
 (Month/Day/Year)
 09/23/2009

____ Director
 ____ Officer (give title below)
 ___X___ 10% Owner
 ____ Other (specify below)

LOS ANGELES, CA 90049

4. If Amendment, Date Original Filed(Month/Day/Year)

6. Individual or Joint/Group Filing(Check Applicable Line)
 ___X___ Form filed by One Reporting Person
 ____ Form filed by More than One Reporting Person

(City) (State) (Zip)

Table I - Non-Derivative Securities Acquired, Disposed of, or Beneficially Owned

| 1. Title of Security (Instr. 3) | 2. Transaction Date (Month/Day/Year) | 2A. Deemed Execution Date, if any (Month/Day/Year) | 3. Transaction Code (Instr. 8) | 4. Securities Acquired (A) or Disposed of (D) (Instr. 3, 4 and 5) | 5. Amount of Securities Beneficially Owned Following Reported Transaction(s) (Instr. 3 and 4) | 6. Ownership Form: Direct (D) or Indirect (I) (Instr. 4) | 7. Nature of Ownership (Instr. 4) |
|---------------------------------|--------------------------------------|--|--------------------------------|---|---|--|-----------------------------------|
| | | | | Code V | Amount | (A) or (D) | Price |
| Common Stock | 09/23/2009 | | S | 500,000 | D | \$ 2.5 | 5,768,881 D |

Reminder: Report on a separate line for each class of securities beneficially owned directly or indirectly.

Persons who respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB control number.

SEC 1474
 (9-02)

Table II - Derivative Securities Acquired, Disposed of, or Beneficially Owned (e.g., puts, calls, warrants, options, convertible securities)

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| 1. Title of Derivative Security (Instr. 3) | 2. Conversion or Exercise Price of Derivative Security | 3. Transaction Date (Month/Day/Year) | 3A. Deemed Execution Date, if any (Month/Day/Year) | 4. Transaction Code (Instr. 8) | 5. Number of Derivative Securities Acquired (A) or Disposed of (D) (Instr. 3, 4, and 5) | 6. Date Exercisable and Expiration Date (Month/Day/Year) | 7. Title and Amount of Underlying Securities (Instr. 3 and 4) | 8. Price of Derivative Security (Instr. 5) | 9. Nu Deriv Secur Bene Own Follo Repo Trans (Instr |
|--|--|--------------------------------------|--|--------------------------------|---|--|---|--|--|
|--|--|--------------------------------------|--|--------------------------------|---|--|---|--|--|

| Date Exercisable | Expiration Date | Title | Amount or Number of Shares |
|------------------|-----------------|-------|----------------------------|
|------------------|-----------------|-------|----------------------------|

| Code | V | (A) | (D) |
|------|---|-----|-----|
|------|---|-----|-----|

Reporting Owners

| Reporting Owner Name / Address | Relationships | | | |
|---|---------------|-----------|---------|-------|
| | Director | 10% Owner | Officer | Other |
| CYTRX CORP 11726 SAN VICENTE BOULEVARD SUITE 650 LOS ANGELES, CA 90049 | | X | | |

Signatures

/s/ CytRx Corporation by Steven A. Kriegsman, CEO 09/24/2009

**Signature of Reporting Person Date

Explanation of Responses:

* If the form is filed by more than one reporting person, *see* Instruction 4(b)(v).

** Intentional misstatements or omissions of facts constitute Federal Criminal Violations. *See* 18 U.S.C. 1001 and 15 U.S.C. 78ff(a).

Note: File three copies of this Form, one of which must be manually signed. If space is insufficient, *see* Instruction 6 for procedure. Potential persons who are to respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB number.