

OMB APPROVAL
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**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

FORM 12b-25

NOTIFICATION OF LATE FILING

(Check one): ☒ Form 10-K ☐ Form 20-F ☐ Form 11-K ☐ Form 10-Q ☐ Form 10-D ☐ Form N-SAR ☐ Form N-CSR

For Period Ended: December 31, 2007

- ☐ Transition Report on Form 10-K
☐ Transition Report on Form 20-F
☐ Transition Report on Form 11-K
☐ Transition Report on Form 10-Q
☐ Transition Report on Form N-SAR

For the Transition Period Ended: _____

Read Instruction (on back page) Before Preparing Form. Please Print or Type.

Nothing in this form shall be construed to imply that the Commission has verified any information contained herein.

If the notification relates to a portion of the filing checked above, identify the Item(s) to which the notification relates:

PART I — REGISTRANT INFORMATION

RXi Pharmaceuticals Corporation

Full Name of Registrant

Former Name if Applicable

60 Prescott Street

Address of Principal Executive Office (*Street and Number*)

Worcester, MA 01605

City, State and Zip Code

PART II — RULES 12b-25(b) AND (c)

If the subject report could not be filed without unreasonable effort or expense and the registrant seeks relief pursuant to Rule 12b-25(b), the following should be completed. (Check box if appropriate).

- ☒ (a) The reason described in reasonable detail in Part III of this form could not be eliminated without unreasonable effort or expense.
- (b) The subject annual report, semi-annual report, transition report on Form 10-K, Form 20-F, Form 11-K, Form N-SAR or Form N-CSR, or portion thereof, will be filed on or before the fifteenth calendar day following the prescribed due date; or the

subject quarterly report or transition report on Form 10-Q or subject distribution report on Form 10-D, or portion thereof, will be filed on or before the fifth calendar day following the prescribed due date; and

- (c) The accountant's statement or other exhibit required by Rule 12b-25(c) has been attached if applicable.
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PART III — NARRATIVE

State below in reasonable detail why Forms 10-K, 20-F, 11-K, 10-Q, 10-D, N-SAR, N-CSR, or the transition report or portion thereof, could not be filed within the prescribed time period.

On March 11, 2008, the Registrant and CytRx Corporation (“CytRx”) completed a partial spin-off of the Registrant from CytRx via the distribution and award of a portion of the Registrant’s common stock held by CytRx to CytRx’s stockholders. In connection with this partial spin-off and the related registration statement filed by the Registrant on Form S-1, extraordinary demands were placed on the personnel of both the Registrant and CytRx, including the accounting department of CytRx on whom the Registrant depends for the carve-out financial information for the Registrant’s financial statements to be included in the Registrant’s Annual Report on Form 10-K. As a result of these demands, the Registrant is unable to complete and file its Annual Report on Form 10-K for the fiscal year ended December 31, 2007 (the “Form 10-K”) by the prescribed filing date without unreasonable effort and expense. The Registrant currently anticipates filing the Form 10-K on or before April 14, 2008.

PART IV — OTHER INFORMATION

- (1) Name and telephone number of person to contact in regard to this notification.

<u>Stephen J. DiPalma</u>	<u>508</u>	<u>929-3604</u>
(Name)	(Area Code)	(Telephone Number)

- (2) Have all other periodic reports required under Section 13 or 15(d) of the Securities Exchange Act of 1934 or Section 30 of the Investment Company Act of 1940 during the preceding 12 months or for such shorter period that the registrant was required to file such report(s) been filed? If answer is no, identify report(s).

Yes ☒ No ☐

- (3) Is it anticipated that any significant change in results of operations from the corresponding period for the last fiscal year will be reflected by the earnings statements to be included in the subject report or portion thereof?

Yes ☐ No ☒

If so, attach an explanation of the anticipated change, both narratively and quantitatively, and, if appropriate, state the reasons why a reasonable estimate of the results cannot be made.

RXi Pharmaceuticals Corporation

(Name of Registrant as Specified in Charter)

has caused this notification to be signed on its behalf by the undersigned hereunto duly authorized.

Date March 31, 2008

By /s/ Stephen J. DiPalma
Name: Stephen J. DiPalma
Title: Chief Financial Officer