



DIVISION OF
CORPORATION FINANCE

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

January 31, 2012

Via E-mail

Dr. Mark J. Ahn, Ph.D.
President
RXi Pharmaceuticals Corporation
60 Prescott Street
Worcester, MA 01605

**Re: RXi Pharmaceuticals Corporation
Amendment No. 3 to Form S-1
Filed January 23, 2012
File No. 333-177498**

Dear Dr. Ahn:

We have reviewed your amended registration statement and response letter each filed on January 23, 2012 and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by amending your registration statement and providing the requested information. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any further amendments to your registration statement and the information you provide in response to these comments, we may have additional comments.

Financial Statements
Notes to Financial Statements
8. Stock-based Compensation
2011 Offerings, page F-24

1. Please refer to your response to comment 2. You state that the April 2011 warrant liability was allocated to RXi's financial statements "based on the expected use of the offering proceeds at the time the offering was completed, rather than on the basis of whether the proceeds were subsequently used for RXi's operations." It appears that RXi did not receive any of the April 2011 offering proceeds and thus

received no consideration for the 50% allocation of the warrant liability. We continue to question why you believe it is appropriate to record the derivative relating to the April 2011 offering in the historical financial statements of RXI. In addition, you state that at the time of the March 2011 offering, “Galena operated only one business, the RNAi business. It was not until the Aphera acquisition that occurred on April 13, 2011, that Galena operated a business other than the RNAi business”. Thus, you have allocated 100% of the warrant liability related to the March offering to RXi’s financial statements. However, at the time of the Aphera acquisition it appears that the offering proceeds should have been reallocated to the business in which the proceeds were to be used. In preparing the financial statements for RXI’s spin-off, amounts that are specifically applicable to a subsidiary should be recorded in the subsidiary’s financial statements. In absence of specific identification, a reasonable allocation may be made. As it appears that the proceeds from the March offering were not used for the business of RXI, it is not clear why allocating the warrant liability associated with the offering is reasonable. Please refer to the guidance in SAB 103 Topic 1.B.1.

12. Subsequent Events, page F-30

2. Please disclose your intended accounting treatment for the exchange of warrants for Galena stock and the elimination of the fair value of \$2.5 million of warrant derivatives on your balance sheet. Clarify in the filing if the warrants associated with the March and April offerings will continue to be exercisable for Galena common stock after the spin-off and not RXI common stock. In addition, please confirm to us that the shares after distribution in “Results of Distribution” on page 30 include the shares as a result of the exchange of warrants for Galena stock in December 2011.

Exhibits

3. Please revise Exhibit 3.1 to file the final dated and signed version of your current amended and restated certificate of incorporation.
4. Please file a copy of your form of amendment to the certificate of incorporation that will be filed with the Secretary of State of Delaware prior to the distribution. Please also confirm that you will file a copy of the final amendment after it has been filed with the Secretary of State of Delaware.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Act of 1933 and all applicable Securities Act rules require. Since the company and its management are in possession of all facts relating to a company’s disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

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Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

You may contact James Peklenk at (202) 551-3661 or Mary Mast at (202) 551-3613 if you have questions regarding comments on the financial statements and related matters. Please contact Jennifer Riegel, Special Counsel, at (202) 551- 3575 or me at (202) 551-3715 with any other questions.

Sincerely,

/s/ Jennifer Riegel for

Jeffrey Riedler
Assistant Director

cc: Dale E. Short, Esq.
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