

Mail Stop 6010

February 12, 2008

Tod Woolf, Ph.D.
Chief Executive Officer
RXi Pharmaceuticals Corporation
One Innovation Drive
Worcester, Massachusetts 01605

**Re: RXi Pharmaceuticals Corporation
Registration Statement on Form S-1/A
Filed February 1, 2008
File No. 333-147009**

Dear Dr. Woolf:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your document in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

General

1. In your next amendment, please revise your registration fee table to reflect the fee calculated in connection with the registration of the offer and sale of the common stock being distributed in the spin-off and the common stock being offered for resale in the Award and Resale prospectuses. The fee regarding the shares distributed in the spin-off should be calculated using book value in accordance with Rule 457(f)(2) and the fee regarding the remaining shares being offered

should be calculated in accordance with Rule 457(a) derived from bona fide offering price range which will be reflected on the cover page of the Resale Prospectus. Please revise accordingly.

Resale Prospectus

2. We note that you have included a price range of \$10 to \$20 per share until your shares are quoted on the NASDAQ Capital Market. Please note that your price range must be bona fide. We interpret this to mean that your range may not exceed \$2 if you price below \$20 and 10% if you price above \$20. Please revise accordingly.

* * *

As appropriate, please amend your registration statement in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

You may contact Sasha Parikh at (202) 551-3627 or Mark Brunhofer at (202) 551-3638 if you have questions regarding comments on the financial statements and related matters. Please contact Jennifer Riegel at (202) 551-3575, Michael Reedich, Special Counsel, at (202) 551-3612 or me at (202) 551-3715 with any other questions.

Sincerely,

Jeffrey Riedler
Assistant Director

cc: Marc Rubenstein, Esq.
Ropes & Gray LLP
One International Place
Boston, MA 02110-2624