

Mail Stop 6010

September 14, 2005

Kenneth C. Carter, Ph.D.
President and Chief Executive Officer
Avalon Pharmaceuticals, Inc.
20358 Seneca Meadows Parkway
Germantown, MD 20876

**Re: Avalon Pharmaceuticals, Inc.
Amendment No. 4 to the Registration Statement on Form S-1
File No. 333-124565**

Dear Dr. Carter:

We have reviewed your filing and have the following comments. If you disagree, we will consider your explanation as to why our comment is inapplicable. Please be as detailed as necessary in your explanation. After reviewing this information, we may or may not 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 on any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form S-1

Subsequent Events, page 43

1. We note your response to comment 5 and reissue the comment in part. Please expand the discussion to explain why the conversion of preferred shares into common stock for preferred shareholders not participating in the line of credit financing is an incentive for existing shareholders to participate in such financing. In this regard, we note the discussion on page 94 to the effect that prior to or on completion of the public offering, all shares of your preferred stock will be automatically converted into common stock. Is there a difference in the conversion ratio for preferred shareholders participating in the line of credit financing?

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Provide a letter keying your responses to the comments, and provide any requested supplemental information. If you believe complying with these comments is not appropriate, tell us why in your letter. The response letter should be uploaded to EDGAR, with the form type label "CORRESP" and linked to the registration statement file number. We may have comments after reviewing revised materials and your responses.

Please contact Song Brandon at (202) 551-3621, John Krug, Senior Attorney, at (202) 551-3862 or me at (202) 551-3710 with any questions.

Sincerely,

Jeffrey Riedler
Assistant Director

cc: John H. Booher, Esq.
Hogan & Hartson LLP
111 South Calvert Street
Baltimore, MD 21202