

April 18, 2016

Via EDGAR Submission

Securities and Exchange Commission
Division of Corporation Finance
100 F Street, NE
Washington, DC 20549

Attention: Scot Foley
Suzanne Hayes

**Re: Syros Pharmaceuticals, Inc.
Amendment No. 1 to
Draft Registration Statement on Form S-1
Submitted February 5, 2016
CIK No. 0001556263**

Ladies and Gentlemen:

On behalf of Syros Pharmaceuticals, Inc. (the "Company"), we are responding to the comments contained in the letter dated February 17, 2016 from the staff (the "Staff") of the Securities and Exchange Commission to Nancy Simonian, M.D., the Company's President and Chief Executive Officer, relating to the Confidential Draft Registration Statement on Form S-1 referenced above (the "Registration Statement"). In response to the Staff's comments, the Company has revised the Registration Statement and is submitting herewith for filing a revised Registration Statement on Form S-1 (the "Revised Registration Statement") with this response letter.

The responses set forth below are based upon information provided to Wilmer Cutler Pickering Hale and Dorr LLP by the Company. For convenience, the responses are keyed to the numbering of the comments and the headings used in the Staff's letter. Where appropriate, the Company has responded to the Staff's comments by making changes to the disclosure in the Registration Statement as set forth in the Revised Registration Statement.

On behalf of the Company, we advise you as follows:

Notes to Financial Statements

16. Subsequent events (unaudited), Page F-34

Wilmer Cutler Pickering Hale and Dorr LLP, 60 State Street, Boston, Massachusetts 02109

Beijing Berlin Boston Brussels Denver Frankfurt London Los Angeles New York Palo Alto Washington

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1. *It appears the Subsequent Events footnote should be audited. Please revise or tell us why no revision is necessary.*

Response: In response to the Staff's comment, the Company has revised the disclosure on page F-30 of the Revised Registration Statement.

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If you have any further questions or comments, or if you require any additional information, please contact the undersigned by telephone at (617) 526-6393. Thank you for your assistance.

Very truly yours,

/s/ Cynthia T. Mazareas

Cynthia T. Mazareas

cc: Nancy Simonian, M.D., *Syros Pharmaceuticals, Inc.*
Kyle Kovalanka, *Syros Pharmaceuticals, Inc.*
Divakar Gupta, *Cooley LLP*