

February 10, 2016

BY COURIER AND EDGARMs. Suzanne Hayes
Assistant Director
Division of Corporation Finance
Securities and Exchange Commission
100 F Street, N.E.
Washington, D.C. 20549**Re: Syndax Pharmaceuticals, Inc.
Registration Statement on Form S-1
Filed January 4, 2016, and as amended January 11, 2016 and February 10, 2016
File No. 333-208861**

Dear Ms. Hayes:

On behalf of Syndax Pharmaceuticals, Inc. (the “**Company**”), this letter is in response to the letter from the Staff (the “**Staff**”), dated January 13, 2016 (the “**Comment Letter**”), to Briggs W. Morrison, M.D., relating to the Company’s registration statement on Form S-1 (the “**Registration Statement**”), as filed with the Securities and Exchange Commission (the “**Commission**”) on January 4, 2016, and as amended on January 11, 2016. The Company is concurrently filing Amendment No. 2 to the Registration Statement (“**Amendment No. 2**”), which incorporates responses to the Comment Letter. For the convenience of the Staff, we are supplementally providing a copy of Amendment No. 2 marked to show changes from the Registration Statement as Amendment No. 1 to the Registration Statement was an exhibit only filing.

For ease of reference, each of the Staff’s comments is set forth in italic type immediately before the corresponding response submitted on behalf of the Company, and the numbering below corresponds to the numbering in the Comment Letter. References to page numbers in the Company’s responses refer to page numbers in Amendment No. 2.

BusinessClinical Development Programs of Entinostat, page 84

1. *The table displaying your pipeline product candidates should reflect the actual, and not the anticipated, status of your pipeline candidates as of the latest practicable date. The footnotes to your pipeline table indicate that the Phase 1 clinical trials for ENCORE 602, ENCORE 603 and NCI-9844 are “still in the planning phase” and that “an IND has not yet been filed” for these product candidates. Accordingly, you should revise your pipeline table on this page and the corresponding*

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table on page 3 so that the relevant bars reflecting the stage of development for each of these candidates extend only to the end of the preclinical column. If the trial for NCI-9844 began enrollment in the fourth quarter of 2015, as you indicated it would on page 96, you may leave the bar unchanged but you should revise the accompanying footnote and any other disclosure about this product candidate to reflect the current status of the trial.

The Company respectfully acknowledges the Staff's comment and has revised the pipeline table on page 3 and page 79 and footnotes to the pipeline table on page 79 of Amendment No. 2.

Business

Our Development of Entinostat in NSCLC and Melanoma, page 93

2. We note your disclosure on page 93 concerning the serious immune-mediated adverse event experienced by one of three patients in your Phase 1b trial for Entinostat in NSCLC and Melanoma. Please further describe the adverse events experienced and discuss how the subsequent "thorough safety review" resulted in the conclusion that the 3mg dosing was tolerable.

The Company respectfully acknowledges the Staff's comment and has revised its disclosure on page 88 of Amendment No. 2 to further describe the adverse events experiences and to discuss how the subsequent "through safety review" resulted in the conclusion that the 3mg dosing was tolerable.

* * *

The Company respectfully requests the Staff's assistance in completing the review of this response letter. Please advise us if we can provide any further information or assistance to facilitate your review. If the Staff should have any questions, or would like further information, concerning any of the responses above, please do not hesitate to contact the undersigned at (202) 637-5457 or Laura Berezin at (650) 463-4194. We thank you in advance for your attention to the above.

Sincerely,

/s/ Jaime L. Chase

Jaime L. Chase

cc: Briggs W. Morrison, M.D., Syndax Pharmaceuticals, Inc.
Michael A. Metzger, Syndax Pharmaceuticals, Inc.
John S. Pallies, Syndax Pharmaceuticals, Inc.
Laura A. Berezin, Esq., Hogan Lovells US LLP
Divakar Gupta, Esq., Cooley LLP
Joshua A. Kaufman, Esq., Cooley LLP
David G. Peinsipp, Esq., Cooley LLP