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December 16, 2021

VIA EDGAR

U.S. Securities and Exchange Commission
Division of Corporation Finance
Office of Life Sciences
100 F Street NE
Washington, DC 20549
Attention: Christine Torney
Al Pavot
Daniel Crawford
Joe McCann

Re: Amylyx Pharmaceuticals, Inc.
Amendment No. 2 to Draft Registration Statement on Form S-1
Submitted November 24, 2021
CIK No. 0001658551

Ladies and Gentlemen:

This letter is confidentially submitted on behalf of Amylyx Pharmaceuticals, Inc. (the "**Company**") in response to the comments of the staff of the Division of Corporation Finance (the "**Staff**") of the U.S. Securities and Exchange Commission (the "**Commission**") with respect to the Company's Amendment No. 2 to the Draft Registration Statement on Form S-1, confidentially submitted on November 24, 2021 ("**Amendment No. 2**"), as set forth in the Staff's letter dated May 27, 2021 (the "**May Comment Letter**") and the Staff's letter dated December 9, 2021 (the "**December Comment Letter**" and together with the May Comment Letter, the "**Comment Letters**") addressed to Joshua B. Cohen and Justin B. Klee, the Company's Co-Chief Executive Officers. The Company is publicly filing the Registration Statement (the "**Registration Statement**"), which includes changes to reflect responses to the Staff's comments and other updates.

For reference purposes, the text of the Comment Letters has been reproduced herein with responses below each numbered comment. For your convenience, we have italicized the reproduced Staff comments from the Comment Letters. Unless otherwise indicated, page references in the descriptions of the Staff's comments refer to Amendment No. 2, and page references in the responses refer to the Registration Statement. All capitalized terms used and not otherwise defined herein shall have the meanings set forth in the Registration Statement.

The responses provided herein are based upon information provided to Goodwin Procter LLP by the Company. In addition to submitting this letter via EDGAR, we are sending via email a copy of each of this letter and the Registration Statement (marked to show changes from Amendment No. 2).

Responses to Comment Letter dated May 27, 2021

Clinical Development of AMX0035 for ALS, page 130 of the Draft Registration Statement confidentially submitted on April 26, 2021

9. *Please revise to present the full open label extension results or advise.*

RESPONSE: In response to the Staff's comment 9 from the May Comment Letter, the Company respectfully advises the Staff that the Company is continuing to collect and analyze patient follow-up data on from the open label extension, or OLE, of the CENTAUR trial. As such, the Company is not in a position at this stage to present and disclose the full OLE data. The Company advises the Staff that the results of its CENTAUR trial were published in September 2020 in the *New England Journal of Medicine* and in October 2020 in the *Journal of Muscle & Nerve*. Trial results showed that patients receiving AMX0035 experienced statistically significant benefit in function, as measured by the Revised ALS Functional Rating Scale, as well as statistically significant improvement in overall survival, when analyzing the randomized population who received at least one dose of AMX0035 or placebo through the OLE trial up to a July 20, 2020 data cutoff. The Company respectfully submits that the current disclosure provides investors with the necessary material information regarding the CENTAUR trial based on the above-referenced peer-reviewed publications of the CENTAUR trial data prior to the July 20, 2020 cutoff.

Principal Stockholders, page 193 of the Draft Registration Statement confidentially submitted on April 26, 2021

18. *Please identify the natural person(s) with voting and/or dispositive power over the shares owned by ALS Invest 1 B.V. and Morningside Venture Investments Limited.*

RESPONSE: In response to the Staff's comment, the Company respectfully advises the Staff that it has revised its disclosure on page 203 of Registration Statement.

Responses to Comment Letter dated December 9, 2021

Amendment No. 2 to Draft Registration Statement submitted November 24, 2021

Summary

Overview, page 2

1. With reference to the disclosure on page 144 concerning the PEGASUS trial, please balance the discussion on page 2 regarding topline results to explain that no differences were seen in the primary or secondary efficacy endpoints.

RESPONSE: In response to the Staff's comment, the Company respectfully advises the Staff that it has revised its disclosure on page 2 of Registration Statement to explain that no differences were seen in the secondary efficacy endpoints. The Company further advises the Staff that the PEGASUS trial did not have a primary efficacy endpoint and the Company has revised its disclosure in the Registration Statement to remove references to a primary efficacy endpoint for the PEGASUS trial.

Clinical Development of AMX0035 for AD, page 144

2. We note your revised disclosures on page 144 presenting the topline results from the PEGASUS trial. Please revise to identify the primary safety and tolerability endpoints and the trial results. Also revise to present the primary efficacy endpoint as well as the additional cognition, function, and imaging endpoints. Present the efficacy trial results so they can be compared to the established endpoints. Also, explain the newly developed composite outcome of cognitive, functional, and imaging measures.

RESPONSE: In response to the Staff's comment, the Company respectfully advises the Staff that it has revised its disclosure on pages 144, 145, and 146 of Registration Statement to identify the primary safety and tolerability endpoint and secondary efficacy endpoints as well as the biomarkers that were analyzed in the trial. The Company has also added an explanation of the newly developed composite outcome of cognitive, functional, and imaging measures named the Global Statistical Test, which is a combination of three change-from-baseline to end-of-study endpoints: Cognition (Modified Alzheimer's Disease Composite Score, or MADCOMS), Function (Functional Activities Questionnaire, or FAQ) and Total Hippocampal Brain Volume (Magnetic Resonance Imaging, or MRI).

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If you should have any questions regarding the enclosed matters, please contact me at (212) 813-8816.

Sincerely,

/s/ Benjamin K. Marsh, Esq.
Benjamin K. Marsh, Esq.

Enclosures
cc: Joshua B. Cohen, Co-Chief Executive Officer, *Amylyx Pharmaceuticals, Inc.*
Justin B. Klee, Co-Chief Executive Officer, *Amylyx Pharmaceuticals, Inc.*
James Frates, Chief Financial Officer, *Amylyx Pharmaceuticals, Inc.*
Mitchell S. Bloom, Esq., *Goodwin Procter LLP*