Cooley

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August 15, 2023

U.S. Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, DC 20549
Attn: Tim Buchmiller
Jason Drory
Eric Atallah
Lynn Dicker

Re: Lexeo Therapeutics, Inc.
Amendment No. 2 to Draft Registration Statement on Form S-1
Submitted May 17, 2023
CIK No. 0001907108

Ladies and Gentlemen:

On behalf of Lexeo Therapeutics, Inc. (the "***Company***"), we are providing this letter in response to the comments of the staff (the "***Staff***") of the U.S. Securities and Exchange Commission (the "***Commission***") Division of Corporation Finance contained in its letter, dated June 13, 2023 (the "***Comment Letter***"), relating to the Company's Amendment No. 2 to the Draft Registration Statement on Form S-1, confidentially submitted on May 17, 2023 (as amended, the "***Draft Registration Statement***").

The Company is concurrently confidentially submitting Amendment No. 3 to the Draft Registration Statement on Form S-1 ("***Amendment No. 3***"), which reflects changes made in response to certain of the comments contained in the Comment Letter.

The numbering of the paragraphs below corresponds to the numbering of the comments contained in the Comment Letter, which for your convenience we have incorporated into this response letter in italics. Page references in the text of this response letter correspond to the page numbers of Amendment No. 3. Capitalized terms used but not otherwise defined in this letter shall have the meanings set forth in Amendment No. 3.

Amendment No. 2 to Draft Registration Statement on Form S-1 submitted May 17, 2023

Cover Page

1. *Please disclose, if accurate, that the closing of this offering is contingent upon a Nasdaq Listing, or otherwise advise. Please ensure the disclosure is consistent in your underwriting agreement.*

Response: The Company respectfully acknowledges the Staff's comment and has revised page 78 of Amendment No. 3 to disclose that the closing of this offering is contingent upon a Nasdaq Listing.

Prospectus summary
Overview, page 1

2. *We note your response to prior comment 1, including your revised disclosure stating that you are using a "clinically validated vector," and reissue. We further note your risk factor disclosure on page 19 that, "very few products that utilize gene transfer have been approved in the United States or Europe. There have been a limited number of clinical trials using AAVrh10." Given your current stage of development and your risk factor disclosure on page 19, it appears to be premature to make the claim your vector is "clinically validated." Please revise this disclosure to remove this statement.*

Response: The Company respectfully acknowledges the Staff's comment and has revised pages 1, 100 and 120 of Amendment No. 3 to remove this statement.

Our manufacturing approach, page 129

3. *We note your disclosure that you believe your manufacturing process "has an improved safety profile over traditional adherent HEK manufacturing." Please revise your disclosure to clarify and describe traditional "HEK manufacturing." In addition, we note you reference that you "have observed reduced incorporation of non-transgene DNA plasmid DNA impurities, from 15% observed in some HEK systems to 0.2% in [y]our process." Please revise your disclosure to discuss the specific studies you are referencing.*

Response: The Company respectfully acknowledges the Staff's comment and has revised pages 6 and 131 of Amendment No. 3.

4. *We note your graphic at the bottom of page 130 appears to measure "MOI" on the x-axis. Please revise your narrative disclosure to explain and define MOI.*

Response: The Company respectfully acknowledges the Staff's comment and has revised page 131 of Amendment No. 3.

5. *We note your disclosure that "[b]ased on [y]our estimates, [you] believe [y]our manufacturing process is approximately 10 times more cost efficient than traditional adherent HEK manufacturing." Please update your disclosure to further explain your basis for this claim.*

Response: The Company respectfully acknowledges the Staff's comment and has revised pages 7 and 131 of Amendment No. 3.

Preclinical safety studies, page 143

6. *We note your disclosure discussing a "hypothetical model" and a graphic at the bottom of page 146. Please update your disclosure to clarify what "NHP PKP2 background subtracted" means and how it was modeled. Please update your disclosure to clarify the material assumptions and discuss any limitations underlying such projections by your "hypothetical model" or otherwise advise.*

Response: The Company respectfully acknowledges the Staff's comment and has revised page 146 of Amendment No. 3 to remove this disclosure and graphic.

2023 equity incentive plan, page 201

7. *We note your response to prior comment 5 and your disclosure that the administrator under the 2023 Plan has the power to modify outstanding awards under your 2023 Plan, including the authority to reprice any outstanding option or stock appreciation right, cancel and re-grant any outstanding option or stock appreciation right in exchange for new stock awards, cash or other consideration, or take any other action that is treated as a repricing under generally accepted accounting principles, with the consent of any materially adversely affected participant. Please clearly disclose if any such repricings could be implemented without stockholder approval. If so, please include appropriate risk factor disclosure, including whether proxy advisory firms could find such repricing without stockholder approval contrary to a performance-based pay philosophy.*

   Response: The Company respectfully acknowledges the Staff's comment and has revised page 78 of Amendment No. 3.

General

8. *Many of your tables and graphics include print that is not legible. For example only, your graphic at the top of page 141 and your graphic at the bottom of page 142 contain text that is too small to be legible. Please revise your graphics throughout your prospectus as applicable to ensure that the text is legible.*

   Response: The Company respectfully acknowledges the Staff's comment and has revised the tables and graphics throughout Amendment No. 3 to ensure that the text is legible.

* * * *

Please direct any questions or further comments concerning Amendment No. 3 or this response letter to either the undersigned at (212) 479-6565 or Dayne Brown of Cooley LLP at (212) 479-6712.

Sincerely

/s/ Eric Blanchard
Eric Blanchard

cc: R. Nolan Townsend, Lexeo Therapeutics, Inc.
Jenny Robertson, Lexeo Therapeutics, Inc.
Dayne Brown, Cooley LLP
Peter Byrne, Cooley LLP
Divakar Gupta, Cooley LLP
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