Cooley

Eric Blanchard
+1 212 479 6565
eblanchard@cooley.com

May 17, 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. 1 to Draft Registration Statement on Form S-1
Submitted May 5, 2022
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 May 17, 2022 (the "***Comment Letter***"), relating to the Company's Amendment No. 1 to Draft Registration Statement on Form S-1, confidentially submitted on May 5, 2022 (the "***Draft Registration Statement***").

The Company is concurrently confidentially submitting Amendment No. 2 to the Draft Registration Statement on Form S-1 (the "***Amendment No. 2***"), 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. 2. Capitalized terms used but not otherwise defined in this letter shall have the meanings set forth in Amendment No. 2.

Amendment No. 1 to Draft Registration Statement on Form S-1 submitted May 5, 2022

Overview, page 1

1. *We note your disclosure here and throughout your draft registration statement that you are "utilizing [y]our modular approach that integrates clinically validated technology." Please revise to clarify what you mean by "clinically validated technology" and provide the basis for that claim.*

   Response: The Company respectfully acknowledges the Staff's comment and has revised pages 1, 99 and 119 of Amendment No. 2 to note that the Company is utilizing a modular approach that integrates a clinically validated vector. The AAVrh10 vector has been given to at least 25 patients across at least five third-party clinical trials. These trials have shown the vector to be well tolerated, and based on results many of the gene therapy candidates are continuing in clinical development.

High Transduction Efficiency and Biodistribution, page 4

2. *We note your response to prior comments 6 and 7 and your revised disclosure on page 4 and 129 and reissue in part. Please revise your disclosure to clearly discuss the specific "preclinical studies and clinical trials" you relied upon as your basis for your belief that AAVrh10 is an "optimal vector for delivery and expression of transgenes for the treatment of the cardiovascular and CNS diseases." Clarify whether you or your collaboration partners conducted these studies/trials or whether unrelated third-parties conducted them. In addition, if your basis is based on preclinical studies on non-human cells, please make that clear or otherwise advise.*

   Response: The Company respectfully acknowledges the Staff's comment and has revised pages 4, 126, 133 and 134 of Amendment No. 2.

Capitalization, page 98

3. *Please revise to remove cash from total capitalization.*

   Response: The Company respectfully acknowledges the Staff's comment and has revised page 94 of Amendment No. 2.

Management's Discussion and Analysis of Financial Condition and Results of Operations Results of operations
Comparison of the years ended December 31, 2021 and 2020, page 112

4. *Please revise to include a discussion of grant revenue for each period in your results of operations.*

   Response: The Company respectfully acknowledges the Staff's comment and has revised pages 105 and 108 of Amendment No. 2.

Equity incentive plans
2022 equity incentive plan, page 191

5. *We note your response to prior comment 21 and revised disclosure on page 192 and reissue in part. Your disclosure states that only the approval of the holders of a majority of the Company's shares is required in "certain circumstances." Please clarify the "certain circumstances" that would require stockholder approval. If certain repricing actions would not require stockholder approval, 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 or otherwise advise.*

   Response: The Company respectfully acknowledges the Staff's comment and has revised page 202 of Amendment No. 2. Specifically, the Company has revised page 202 to clarify that the 2023 Plan does not require stockholder approval to modify, through any repricing action or otherwise, outstanding awards under the 2023 Plan. Furthermore, the Company respectfully advises the Staff that it does not view the potential negative recommendation from proxy advisory firms for such an action as a material risk at this time.

* * * *

Please direct any questions or further comments concerning Amendment No. 2 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
Siavosh Salimi, Goodwin Procter LLP
William A. Magioncalda, Goodwin Procter LLP