UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

DIVISION OF
CORPORATION FINANCE

August 18, 2023

R. Nolan Townsend
Chief Executive Officer
Lexeo Therapeutics, Inc.
345 Park Avenue South, Floor 6
New York, NY 10010

Re: Lexeo Therapeutics, Inc.
Amendment No. 3 to
Draft Registration Statement on Form S-1
Submitted August 16, 2023
CIK No. 0001907108

Dear R. Nolan Townsend:

We have reviewed your amended draft registration statement and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by providing the requested information and either submitting an amended draft registration statement or publicly filing your registration statement on EDGAR. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing the information you provide in response to these comments and your amended draft registration statement or filed registration statement, we may have additional comments.

Amendment No. 3 to Draft Registration Statement on Form S-1

Cover Page

1. We note your response to prior comment 1 and revised disclosure on page 78. Please revise your cover page disclosure to clarify your proposed offering is contingent upon Nasdaq Listing.

Prospectus Summary
Overview, page 1

2. We note your statement that you have “best in class science in the discovery and development of any next generation genetic medicine candidates.” Given the development

stage of product candidates and length of the drug approval process, it is premature and inappropriate to speculate or imply that your science is “best-in-class.” Please remove this statement.

Our Pipeline, page 2

3. We note the revisions to the pipeline table on pages 2 and 121.The point of the arrow for each product candidate should end at its current status. For example only, where the LX2020 study has not yet commenced Phase 1, the arrow should end in preclinical until your Phase 1 trial begins. In addition, it appears that you have not completed the discovery of LX2022 as you state you "plan to complete candidate selection for LX2022 in 2024," the arrow should not go all the way to the end of "discovery."

Our manufacturing approach, page 130

4. We note your response to prior comments 3 and 5 and reissue in part. Please revise your disclosure to clarify the "next-generation sequencing analysis" that was preformed. Your disclosure should clarify which "HEK systems" you compared your process to. For example only, to the extent your analysis evaluated more than one HEK system, your disclosure should state the percentage of impurities observed for each system. In addition, we note your disclosure that "[b]ased on information from a third-party contract development and manufacturing organization and internal estimates, we believe our manufacturing process is approximately 10 times more yield efficient than an HEK process to manufacture AAVrh10." Please revise your disclosure to clarify the specific types of information and estimates you relied upon to support your belief that your process is "10 times more efficient" or otherwise advise.

You may contact Eric Atallah at 202-551-3663 or Lynn Dicker at 202-551-3616 if you have questions regarding comments on the financial statements and related matters. Please contact Jason Drory at 202-551-8342 or Tim Buchmiller at 202-551-3635 with any other questions.

Sincerely,

Division of Corporation Finance
Office of Life Sciences

cc: Dayne Brown, Esq.