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June 11, 2021

VIA EDGAR

Office of Life Sciences
Division of Corporation Finance
United States Securities and Exchange Commission
100 F Street N.E.
Washington, D.C. 20549
Attn: Kristin Lochhead
Daniel Gordon
Jane Park
Jeffrey Gabor

**Re: Graphite Bio, Inc.
Amendment No. 1 to Draft Registration Statement on Form S-1
Submitted on May 21, 2021
CIK No. 0001815776**

Ladies and Gentlemen:

This letter is being submitted on behalf of Graphite Bio, Inc. (the "**Company**") in response to comments contained in the letter dated June 7, 2021 (the "**Letter**") from the Staff (the "**Staff**") of the Securities and Exchange Commission (the "**Commission**") to Josh Lehrer, Chief Executive Officer of the Company, with respect to the Company's confidential submission of Amendment No. 1 to the Draft Registration Statement on Form S-1 that was submitted on May 21, 2021 (the "**Amended Draft Registration Statement**"). The Company is concurrently filing an Amendment No. 1 to the Registration Statement on Form S-1 (the "**Amended Registration Statement**") that was filed on June 4, 2021, including changes in response to the Staff's comments.

The responses set forth below have been organized in the same manner in which the Commission's comments were organized and, unless otherwise indicated, all page references in the recitations of the Staff's comments refer to the Amended Draft Registration Statement and page references in the Company's response refer to the Amended Registration Statement as marked. Copies of this letter and its attachments will also be provided to Kristin Lochhead, Daniel Gordon, Jane Park and Jeffrey Gabor of the Commission.

Stanford Exclusive License Agreement and Option Agreement, page 96

1. *We note your disclosure on page 97 of the First Option Agreement with Stanford. Please expand your disclosure to include discussion of the Second Option Agreement with Stanford, including whether you have exercised this option. We refer to your disclosure of the Second Option Agreement on page 146.*

RESPONSE: The Company respectfully acknowledges the Staff's comment and has expanded the disclosure on pages 97-98 of the Amended Registration Statement to include discussion of the Second Option Agreement with Stanford, and disclose that this option has not yet been exercised.

Management's Discussion and Analysis of Financial Condition and Results of Operations Critical Accounting Policies and Significant Judgments and Estimates, Stock-Based Compensation Expense, page 107

2. *Once you have an estimated offering price or range, please tell us the fair value of the common stock underlying your issuances of share based compensation for the most recent period and explain the reasons for any differences between the recent valuations of your common stock leading up to the initial public offering and the estimated offering price. This information will help facilitate our review of your accounting for equity issuances, including share based compensation. Please discuss with the staff how to submit your response.*

RESPONSE: The Company respectfully acknowledges the Staff's comment and notes that the Company has provided the additional requested information in our letter to the Commission dated June 10, 2021.

Exhibits

3. *We refer to the exclusive license agreements (including the amendments thereto) and option agreements filed as Exhibits 10.12, 10.13, 10.14 and 10.15 to your registration statement. We note that certain identified information has been redacted in these exhibits because it is not material. Please revise the statement on the first page of each exhibit to note that certain identified information has been excluded from such exhibit because it is both not material and is the type that you treat as private or confidential. Refer to Item 601(b) of Regulation S-K.*

RESPONSE: The Company respectfully acknowledges the Staff's comment and has revised the statements on the first page of each of the indicated exhibits to include the noted language and re-filed such exhibits with the Amended Registration Statement.

If you require additional information, please telephone the undersigned at (415) 733-6071.

Sincerely,

/s/ Maggie Wong

Maggie Wong

Enclosures:

cc: Josh Lehrer, Graphite Bio, Inc.
Shoaib Ghias, Goodwin Procter LLP
Mitchell S. Bloom, *Goodwin Procter LLP*
Charlie Kim, *Cooley LLP*
Kristin VanderPas, *Cooley LLP*
Denny Won, *Cooley LLP*
David Peinsipp, *Cooley LLP*