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

DIVISION OF
CORPORATION FINANCE

May 14, 2021

Josh Lehrer
Chief Executive Officer
Graphite Bio, Inc.
279 East Grand Avenue, Suite 430
South San Francisco, CA 94080

Re: Graphite Bio, Inc.
Draft Registration Statement on Form S-1
Submitted April 16, 2021
CIK No. 0001815776

Dear Dr. Lehrer:

We have reviewed your 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.

Draft Registration Statement on Form S-1 submitted April 16, 2021

Overview, page 1

1. Please clarify the meaning of scientific or technical terms the first time they are used in order to ensure that lay readers will understand the disclosure. For example, please briefly explain what you mean by insertional oncogenesis, XSCID, CCR5, and HbgS.

2. Given your dependence on intellectual property licensed from third parties, particularly Stanford University, please revise this section to state that your gene editing platform relies on certain patent rights and proprietary technology from third parties.

3. We note your statement that you believe your approach could enable "limitless applications." Please place this selected disclosure in its proper context by revising your Summary disclosure to make it clear, per the disclosure on page 43, that the Stanford License Agreement provides that your field of use is solely for the development of prophylactics and therapeutics for sickle cell disease, XSCID, and beta-thalassemia.

Our Pipeline, page 7

4. We note that you have combined the columns for Phase 1 and 2 trials in your pipeline table. Please revise to include a separate column for the Phase 2 trial. In addition, we note the inclusion of “Other non-HSC discovery programs” for undisclosed indications in the last row of your pipeline table. Given the status of development and limited disclosure regarding the discovery programs, it seems premature to highlight these programs prominently in your Summary pipeline table. Please remove them from the Summary table and on page 112 or advise.

5. We refer to the fourth and fifth rows in your pipeline table under the headings “Therapeutic protein production (CCR5 locus)” and “Therapeutic protein production (alpha-globin).” Given the early-stage development of these programs, please explain why these programs are sufficiently material to your business to warrant inclusion in your pipeline table. If they are material, please expand your disclosure in your Business section to provide a more fulsome discussion of these programs, including a description of preclinical studies or other development activities conducted. Alternatively, remove any programs that are not currently material from your pipeline table.

Our Strategy, page 7

6. We note your disclosure under the first bullet point on pages 8 and 113 that your strategy is to “rapidly demonstrate” clinical proof-of-concept for gene correction with your lead product candidate. Please revise these statements and any similar disclosure to remove any implication that you will be successful in advancing your product candidate in a rapid or accelerated manner as such statements are speculative.

Our Team and Investors, page 7

7. We note that your website lists Dr. Daniel Dever a co-founder and the Head of Discovery Research of the company. Please explain whether Dr. Dever remains involved in the company, and if so, in what capacity. If material, please revise the prospectus, where appropriate, to discuss Dr. Dever’s role in founding the company and describe his current role, including any compensation derived from his services.

We face significant competition in an environment of rapid technological change..., page 28

8. We note your disclosure on pages 29 and 138 that several of your competitors in preclinical or clinical development also utilize CRISPR nuclease technology in gene editing therapies. Please disclose whether any of your competitors are utilizing CRISPR technology with HDR or for the treatment of sickle cell disease, XSCID or Gaucher disease.

Our rights to develop and commercialize our gene editing platform technology and product candidates are subject..., page 42

9. We note your disclosure that the in-licensed patent rights from the Stanford License are jointly owned by Stanford University and a third party. Please identify the third party or tell us why this information is not material.

Our amended and restated by-laws will designate the Court of Chancery of the State of Delaware..., page 78

10. We note your disclosure that the forum selection provision in your amended by-laws may limit your stockholders' ability to litigate disputes with you in a different judicial forum. Please revise this risk factor and your disclosure in the Business section to disclose that there is also a risk that your forum selection provision may result in increased costs for investors to bring a claim.

Gene Replacement, page 111

11. We note your disclosure here and elsewhere in the prospectus that you have an agreement to investigate the potential use of a clinical-stage non-genotoxic HSC targeted conditioning regimen with GPH201. Please expand your disclosure to discuss the material terms of and the parties to the agreement. If material, please also file the agreement as an exhibit to the registration statement as required by Item 601(b)(10) of Regulation S-K or tell us why you believe you are not required to do so.

Preclinical Validation, page 128

12. We note your disclosure on pages 132 and 135 concerning the preclinical data for each of your GPH201 and GPH301 product candidates. Please revise to include more detailed descriptions of each preclinical trial conducted, including the number of tests conducted, the number of samples used in each test and the range of results observed.

13. We refer to the graphics on right panel of the figure on page 129 and the lower right panel of the figure on page 132 under the heading "IL2RG gene replacement in XSCID patient…" Please expand your disclosure, where appropriate, to discuss your results concerning the lymphoid and myeloid/erythroid cells.

14. We note that the graphics on page 135 under the heading "Figure: Insertion of the GBA gene in the CCR5 safe harbor…" contain text that is illegible. Please revise accordingly.

GPH101 Phase 1/2 Clinical Trial Design, page 130

15. Please revise this section to explain the primary and secondary endpoints of your Phase 1/2 clinical trial of GPH101, as well as for your Phase 1/2 trials for GPH201 and GPH301 on pages 133 and 135 respectively, if any. We also note that you have not yet completed IND studies for your GPH201 and GPH301 product candidates. In this regard, please also disclose in this section when you expect to complete your IND-enabling studies for each of the GPH201 and GPH301 product candidates.

Competition, page 138

16. Please revise your discussion of competitive conditions by describing in greater detail the current landscape for patent protections in your industry. In this regard, we note that across several risk factors on pages 41 to 50 you address specific risks stemming from existing third-party patents and patent applications. In your discussion of this landscape, identify specific patents and patent applications, if material, as well as their holders/applicants.

Intellectual Property, page 139

17. We note your disclosure on page 139 that you intend to obtain rights to various components of your genome editing platform through one or more licenses from third parties. To the extent known, please disclose the third parties you intend to license patent applications from. Please also clarify whether your platform is dependent upon these rights. If so, please include appropriate risk factor disclosure.

18. You disclose on page 139 that you own one provisional patent application relating to the gene editing and replacement for the treatment of beta-thalassemia. Please also disclose the type of patent protection that would be provided for this patent application.

19. We note your disclosure of seven in-licensed patent applications from Stanford. Please expand your disclosure to include the patent protections afforded to each of the seven patent applications, as well as the jurisdictions of the six ex-U.S. patent applications. We also refer to your disclosure on page 43 that your in-licensed patent rights under the Stanford License Agreement are jointly owned by Stanford University and another third party. Please disclose in this section the third party that jointly owns your in-licensed patent rights.

Exclusive License Agreement with the Board of Trustees of the Leland Stanford Junior University, page 140

20. Please disclose when the last-to-expire licensed patent is scheduled to expire and the aggregate amounts paid to date under the Stanford License Agreement.

Principal Stockholders, page 184

21. In your revised prospectus, please include footnotes to your table to identify the natural persons who are the beneficial owners of the shares held by entities affiliated with Versant Ventures and Samsara BioCapital.

General

22. Please provide us with supplemental copies of all written communications, as defined in Rule 405 under the Securities Act, that you, or anyone authorized to do so on your behalf, have presented or expect to present to potential investors in reliance on Section 5(d) of the Securities Act, whether or not you retained, or intend to retain, copies of those communications.

You may contact Kristin Lochhead at 202-551-3664 or Daniel Gordon at 202-551-3486 if you have questions regarding comments on the financial statements and related matters. Please contact Jane Park at 202-551-7439 or Jeffrey Gabor at 202-551-2544 with any other questions.

Sincerely,

Division of Corporation Finance
Office of Life Sciences

cc: Maggie Wong, Esq.