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

DIVISION OF
CORPORATION FINANCE

May 1, 2020

Lloyd M. Segal
Chief Executive Officer
Repare Therapeutics Inc.
7210 Frederick-Banting, Suite 100
St-Laurent, Québec, Canada H4S 2A1

Re: Repare Therapeutics Inc.
Draft Registration Statement on Form S-1
Submitted April 6, 2020
CIK No. 0001808158

Dear Mr. Segal:

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 submitted April 6, 2020

Prospectus Summary, page 1

1. Based on your disclosure under "Intellectual Property" on page 124, it does not appear that you currently have patent protection for your leading product candidate or for any aspect of your SNIPRx platform. Please include a brief disclosure regarding the current status of your intellectual property rights in your prospectus summary and enhance the risk factor disclosure in the last bullet point on page 8 to more prominently disclose the risks to your business if you are not able to obtain such rights.

Our Clinical Program, RP-3500, page 5

2. Please revise your statements in your prospectus that RP-3500 has the potential to be a

"best-in-class" inhibitor. These statements could be interpreted as implying an expectation of regulatory approval and, if approved, favorable comparability to competitive products in terms of safety and efficacy, which would appear to be premature given the length of time and uncertainty with respect to securing marketing approval.

Risks Associated with Our Business, page 7

3. If you believe that you will be classified as a passive foreign investment company, or PFIC, for the taxable year ending December 31, 2020, please revise the summary to briefly indicate your anticipated PFIC status and the risks to U.S. investors, including the adverse U.S. federal income tax consequences disclosed on page 70 such as ineligibility for any preferential tax rates for individuals on capital gains.

Use of Proceeds, page 79

4. Please expand your disclosure regarding the proceeds to be used for your leading product candidate to describe how far in the development process you estimate the allocated proceeds from this offering will enable you to reach.

Critical Accounting Policies and Significant Judgments and Estimates
Share-Based Compensation, page 99

5. Once you have an estimated offering price or range, please explain to us how you determined the fair value of the common stock underlying your equity issuances and 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 stock compensation and beneficial conversion features.

Our Corporate History and Team, page 106

6. Please clarify, here or in the appropriate section of your filing, how members of the scientific advisory board are compensated.

Mechanism of Action, page 113

7. Given your disclosure that "[w]hen ATR is inhibited, cells with DNA damage or incomplete DNA replication can undergo cell division," please expand your disclosure to clarify how ATR inhibition leads to cell death as shown in your illustration on page 114.

Preclinical Data: Monotherapy, page 117

8. We note your disclosure that you observed RP-3500 to have a favorable safety profile in your preclinical studies. Since this disclosure may imply that your product candidate is safe, and safety determinations are solely within the authority of the U.S. Food and Drug Administration and comparable regulatory bodies, please revise your disclosure to remove this implication.

Proposed Design of Phase 1/2 Clinical Trial of RP-3500, page 121

9. Please define the term ORR which is indicated as one of your key endpoints for your Phase 1/2 clinical trials.

Intellectual Property, page 124

10. Please briefly explain the process for a PCT application and how that application can mature into a patent application in the United States. Additionally, please discuss the potential consequences for you if you are unable to obtain patent protection for RP-3500, your lead product candidate.

11. Please clarify if any of the new SL pairs that you identify would be protectable through intellectual property rights or otherwise. If competitors could develop inhibitors based on the SL pairs that you identify that would not be protected by any intellectual property rights that you obtain, please include appropriate risk factor disclosure.

Research Services, License and Collaboration Agreement with Ono Pharmaceutical Co., page 125

12. We note your reference in the third paragraph to "low double-digit" percentages. Please revise your disclosure to narrow the royalty range to no more than a ten percentage point range.

License Agreement with New York University, page 126

13. We note your disclosure in the fifth paragraph that you will be required to pay New York University a "specified percentage" of any future milestone payments received under the Ono Agreement from Ono for pre-IND development milestones, and a "specified percentage" of any future milestone payments received from Ono for post-IND development, regulatory and commercial milestones. Please revise your disclosure to narrow the specified percentages to no more than a ten percentage point range.

Potential Payments and Benefits upon Termination or Change in Control, page 154

14. Please file the change in control and severance agreements described in this section as exhibits.

Principal Shareholders, page 168

15. Please ensure that you have identified the natural persons who have or share beneficial ownership of the securities held by each of the entities listed in your table.

Description of Share Capital, page 170

16. We note your disclosure that you have an unlimited number of common shares and an unlimited number of preferred shares. Please include risk factor disclosure addressing the risks associated with your authorized capital or tell us why such disclosure would not

be appropriate.

Lock-Up Agreements, page 175

17. Given your disclosure on page 165 that the second amended and restated unanimous shareholders' agreement will terminate upon the completion of your offering, please clarify how the market-standoff provisions described in the second paragraph of this section will apply for a period of 180 days following the date of your prospectus.

General

18. Please provide us with 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, present to potential investors in reliance on Section 5(d) of the Securities Act, whether or not they retain copies of the communications.

You may contact Tracey McKoy at (202) 551-3772 or Kate Tillan at (202) 551-3604 if you have questions regarding comments on the financial statements and related matters. Please contact Tim Buchmiller at (202) 551-3635 or Celeste Murphy at (202) 551-3257 with any other questions.

Sincerely,

Division of Corporation Finance
Office of Life Sciences

cc: Divakar Gupta, Esq.