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VIA EDGAR

May 29, 2020

U.S. Securities and Exchange Commission  
Division of Corporation Finance  
100 F Street, N.E.  
Washington, D.C. 20549

Attn: Ms. Tracey McKoy  
Ms. Kate Tillan  
Mr. Tim Buchmiller  
Ms. Celeste Murphy

Re: **Repare Therapeutics Inc.**  
**Amendment No. 1 to Draft Registration Statement on Form S-1**  
**Submitted May 12, 2020**  
**CIK No. 0001808158**

Ladies and Gentlemen:

On behalf of our client, Repare Therapeutics Inc. (the “**Company**”), we are responding to the comments of the staff (the “**Staff**”) of the Securities and Exchange Commission (the “**Commission**”) contained in its letter dated May 18, 2020 (the “**Comment Letter**”), relating to the above referenced Amendment No. 1 to Confidential Draft Registration Statement on Form S-1 (the “**Amended Draft Registration Statement**”). The Company is concurrently publicly filing its Registration Statement on Form S-1 (the “**Registration Statement**”), which reflects changes made in response to the comments set forth in the Comment Letter (the “**Comments**”) and certain other changes. We are also sending a copy of this letter, along with copies of the Registration Statement in typeset format, including a version that is marked to show changes to the Amended Draft Registration Statement, to the Staff.

Set forth below are the Company’s responses to the Comments. The numbering of the paragraphs below corresponds to the numbering of the Comments, which for your convenience we have incorporated into this response letter. Page references in the text of this response letter correspond to the page numbers of the Registration Statement. Capitalized terms used in this letter but otherwise not defined herein shall have the meanings ascribed to such terms in the Registration Statement.

Amendment No.1 to Draft Registration Statement on Form S-1 submitted May 12, 2020

Intellectual Property, page 127

1. We note your response to prior comment 11. As indicated in your response, please revise your disclosure to clarify that the SL pairs that you may identify would not be patent-eligible.

**Response to Comment 1:**

**In response to the Staff's comment, the Company has revised the disclosure on page 54 of the Registration Statement.**

Principal Shareholders, page 172

2. We note your disclosure in footnote 2 that Todd Foley may, collectively with the other members of such entities, be deemed to share voting and investment power with respect to the shares held by each of the MPM Entities. Please ensure that you have identified all natural persons who have or share beneficial ownership of the securities held by each of the MPM Entities. Please also expand your disclosure in footnotes 4 and 5 to provide the disclosure requested by prior comment 15.

**Response to Comment 2:**

**In response to the Staff's comment, the Company has revised the disclosure on page 180 of the Registration Statement.**

\* \* \* \*

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Please direct any questions or further comments concerning the Registration Statement or this response letter to either the undersigned at +1 212 479 6474 or Courtney Thorne of Cooley LLP at +1 617 937 2318.

Very truly yours,

/s/ Divakar Gupta

Divakar Gupta

cc: Lloyd M. Segal, Repare Therapeutics Inc.  
Steve Forte, Repare Therapeutics Inc.  
Marc A. Recht, Cooley LLP  
Ryan S. Sansom, Cooley LLP  
Courtney T. Thorne, Cooley LLP  
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