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PALO ALTO SAN FRANCISCO SEOUL SHANGHAI WASHINGTON

Covington & Burling LLP
One International Place
Suite 1020
Boston, MA 02110-2600
T +1 617 603 8800

September 20, 2024

VIA EDGAR

U.S. Securities and Exchange Commission
Division of Corporation Finance
Office of Life Sciences
100 F Street, N.E.
Washington, D.C. 20549
Attn: Tracie Mariner
Kevin Vaughn
Tyler Howes
Tim Buchmiller

Re: Cartesian Therapeutics, Inc.
Amendment No. 1 to Registration Statement on Form S-1
Filed September 9, 2024
File No. 333-281204

Dear Ms. Mariner, Mr. Vaughn, Mr. Howes and Mr. Buchmiller,

On behalf of Cartesian Therapeutics, Inc. ("Cartesian" or the "Company"), we are submitting this letter in response to a letter, dated September 16, 2024, from the staff (the "Staff") of the Securities and Exchange Commission (the "Commission") with respect to the Company's Amendment No. 1 to the Registration Statement on Form S-1 filed with the Commission on September 9, 2024 ("Amendment No. 1"). The Company is concurrently filing Amendment No. 2 to the Registration Statement ("Amendment No. 2"), which includes changes to reflect responses to the Staff's comments and other updates.

The numbering of the paragraphs below corresponds to the numbering of the comments in the letter from the Staff. For the Staff's convenience, we have incorporated the text of the Staff's comments into this response letter in italics. Unless otherwise indicated, page references in the responses correspond to the page numbers in Amendment No. 2, and page references otherwise correspond to the page numbers in Amendment No. 1. Capitalized terms used in this letter but not otherwise defined herein shall have the meanings set forth in Amendment No. 2.

The responses provided herein are based on information provided to Covington & Burling LLP.

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

Prospectus Summary

Company Overview, page 3

1. *We note your response to prior comment 1 and reissue in part. Please revise your prospectus summary to define the term "durable clinical benefit" as used here and throughout the prospectus. In your revisions, please also briefly discuss the objective results underlying your conclusion that you observed a "durable clinical benefit" in your Phase 2 clinical trial in patients with myasthenia gravis.*

Response to Comment No. 1:

The Company respectfully acknowledges the Staff's comment and advises the Staff that it has revised the disclosures on pages 3, 40 and 59 of Amendment No. 2 in response to the Staff's comment.

Risk Factors

Anti-takeover provisions in our charter documents and under Delaware law..., page 34

2. *We note your response to prior comment 2 and reissue in part. Please further revise this risk factor to clearly state whether this provision applies to actions arising under the Securities Act or Exchange Act. If this provision does not apply to actions arising under the Securities Act or Exchange Act, please also ensure that the exclusive forum provision in your governing documents states this clearly, or tell us how you will inform investors in future filings that the provision does not apply to any actions arising under the Securities Act or Exchange Act.*

Response to Comment No. 2:

The Company respectfully acknowledges the Staff's comment and advises the Staff that it has revised the disclosures on page 34 of Amendment No. 2 in response to the Staff's comment to indicate that this provision applies to actions arising under the Securities Act and the Exchange Act.

Management's Discussion and Analysis of Financial Condition and Results of Operations

Results of Operations, page 42

3. *We have read your response to prior comment three. Please address the following points:*
    - *As requested in the prior comment, please expand your disclosure of research and development expenses that you do not track by program to provide a breakdown by type or nature of expense for each period presented.*
    - *You indicate in your response that the phrase "strategic reprioritization," on page 45 of the Amended Registration Statement, is being used to describe the shift in the Company's focus following the Merger to devote substantially all of its financial resources and efforts to developing its mRNA-based therapies for the treatment of autoimmune diseases. Please expand your disclosure here to include this information.*
    - *Confirm in your response that, to the extent you do track expenses by program in the future, you will separately disclose the amount of such expenses by program.*

Response to Comment No. 3:

The Company respectfully acknowledges the Staff's comment and advises the Staff that it has revised the disclosures on pages 43, 44, 45, and 46 of Amendment No. 2 in response to the Staff's comment to provide a breakdown by type or nature of expense for each period presented and to clarify that the term "strategic reprioritization" is being used to describe the shift in the Company's focus following the Merger to devote substantially all of its resources and efforts to developing its mRNA-based therapies for the treatment of autoimmune diseases.

The Company confirms that, to the extent it begins tracking expenses by program in the future, it intends to separately disclose the amount of such expenses by program.

Business

Clinical Development, page 62

4. *We note disclosure in this section stating that adverse events observed in your clinical trial of Descartes-08 were "transient and mostly mild." We also note that the table on page 64 indicates that three of the adverse events observed were reported as Serious Adverse Events. Please revise the narrative disclosure appearing in this section to clearly disclose the number of Serious Adverse Events observed in your clinical trials of Descartes-08.*

Response to Comment No. 4:

The Company respectfully acknowledges the Staff's comment and advises the Staff that it has revised the disclosures on pages 61 and 65 of Amendment No. 2 in response to the Staff's comment to clearly disclose the number of serious adverse events observed in its clinical trials of Descartes-08.

We thank the Staff for their review and comments on Amendment No. 1 to the Registration Statement. We acknowledge that it is the responsibility of the Company and its management to provide adequate and accurate disclosures in its filings.

We are committed to cooperating with the Staff and providing any additional information or clarification as needed. We respectfully request that the Staff inform us of any further comments or questions, or if the Staff is satisfied with our responses and has no further comments.

If you have any questions or need any additional information, please contact me at 617-603-8815 or sgriffiths@cov.com.

Sincerely,

/s/ Sarah C. Griffiths

Sarah C. Griffiths
Covington & Burling LLP

cc: Carsten Brunn, Cartesian Therapeutics, Inc.
Blaine Davis, Cartesian Therapeutics, Inc.
Matthew Bartholomae, Cartesian Therapeutics, Inc.
Brian K. Rosenzweig, Covington & Burling LLP