

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

**FORM S-3
REGISTRATION STATEMENT**
*UNDER
THE SECURITIES ACT OF 1933*

CARTESIAN THERAPEUTICS, INC.
(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

26-1622110
(I.R.S. Employer
Identification Number)

7495 New Horizon Way
Frederick, Maryland 21703
(301) 348-8698
(Address, including zip code and telephone number, including area code, of registrant's principal executive offices)

Carsten Brunn, Ph.D.
President and Chief Executive Officer
7495 New Horizon Way
Frederick, Maryland 21703
(301) 348-8698
(Name, address, including zip code and telephone number, including area code, of agent for service)

With copies to:
Brian K. Rosenzweig
Sarah C. Griffiths
Covington & Burling LLP
One International Place, Suite 1020
Boston, Massachusetts 02110
(617) 603-8805

Approximate date of commencement of proposed sale to the public: From time to time after this registration statement becomes effective.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box:

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box:

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input checked="" type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of Securities Act.

The Registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act or until the registration statement shall become effective on such date as the Commission acting pursuant to said Section 8(a) may determine.

EXPLANATORY NOTE

On November 13, 2023, Cartesian Therapeutics, Inc., or the Company, and the Delaware corporation which was then known as Cartesian Therapeutics, Inc., or Old Cartesian, entered into an Agreement and Plan of Merger, or the Merger Agreement, pursuant to which Old Cartesian became a wholly owned subsidiary of the Company.

Concurrently with the entry into and completion of the transactions contemplated by the Merger Agreement, we entered into a Securities Purchase Agreement, or the Securities Purchase Agreement, with the selling stockholders named in this prospectus, or the Selling Stockholders, pursuant to which we sold to the Selling Stockholders an aggregate of 149,330.115 shares of our Series A Non-Voting Convertible Preferred Stock, par value \$0.0001 per share.

In connection with the Merger Agreement and the Securities Purchase Agreement, we entered into a registration rights agreement, or the 2023 RRA, with, among others, the Selling Stockholders named in this prospectus, pursuant to which we agreed to prepare and file a resale registration statement with the SEC within 90 calendar days following November 15, 2023, with respect to the shares of our common stock, par value \$0.0001 per share, or the Common Stock, that are being offered by the Selling Stockholders pursuant to this prospectus. We also agreed to use our commercially reasonable efforts to cause such registration statement to be declared effective by the SEC by March 29, 2024 (or by May 13, 2024 if the SEC reviews the registration statement). The parties to the 2023 RRA previously waived these registration requirements during the period in which we were not eligible to use Form S-3 to register resales of the shares of Common Stock that are being offered by the Selling Stockholders pursuant to this prospectus. The registration statement of which this prospectus forms a part is intended to satisfy our remaining registration obligations with respect to the Registrable Securities (as defined in the 2023 RRA) held by the Selling Stockholders pursuant to the 2023 RRA.

The information in this preliminary prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell nor does it seek an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED DECEMBER 13, 2024

PROSPECTUS

11,392,350 Shares



Cartesian Therapeutics, Inc.

Common Stock

Offered by the Selling Stockholders

This prospectus relates to the proposed resale or other disposition by the selling stockholders identified herein, or the Selling Stockholders, of up to (i) 110,123 shares, or the Merger Common Shares, of our common stock, par value \$0.0001 per share, or the Common Stock, (ii) 6,304,558 shares of Common Stock, or the Merger Conversion Shares, issued or issuable upon the conversion of 189,136.767 shares, or the Merger Preferred Shares, of our Series A Non-Voting Convertible Preferred Stock, par value \$0.0001 per share, or the Series A Preferred Stock, and (iii) 4,977,669 shares of Common Stock, or the Private Placement Conversion Shares, which were issued or are issuable upon the conversion of 149,330.115 shares, or the Private Placement Preferred Shares, of Series A Preferred Stock. Subject to certain beneficial ownership limitations, the Series A Preferred Stock are convertible into shares of Common Stock at a ratio of 33.333 shares of Common Stock per share of Series A Preferred Stock. The shares of Common Stock registered pursuant to the registration statement of which this prospectus forms a part are referred to herein as the “Resale Shares.”

The Merger Common Shares and the Merger Preferred Shares were issued to former stockholders of Old Cartesian in connection with the Merger (each as defined below). See the disclosure under the heading “*The Company*” elsewhere in this prospectus for more information regarding the Merger. The Private Placement Preferred Shares were issued and sold to accredited investors in a private placement, or the 2023 Private Placement, pursuant to a Securities Purchase Agreement, dated November 13, 2023, or the Securities Purchase Agreement, between the Company and such investors. We refer to the Merger and the 2023 Private Placement collectively as the Transactions. We are not selling any Resale Shares under this prospectus and will not receive any of the proceeds from the sale or other disposition of Resale Shares by the Selling Stockholders.

The Selling Stockholders may sell the Resale Shares on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale, on the over-the-counter market, in one or more transactions otherwise than on these exchanges or systems, such as privately negotiated transactions, or using a combination of these methods, and at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. See the disclosure under the heading “*Plan of Distribution*” elsewhere in this prospectus for more information about how the Selling Stockholders may sell or otherwise dispose of their Resale Shares hereunder.

The Selling Stockholders may sell any, all or none of the securities offered by this prospectus and we do not know when or in what amount the Selling Stockholders may sell their Resale Shares hereunder following the effective date of the registration statement of which this prospectus forms a part.

The Selling Securityholders may be deemed to be “underwriters” within the meaning of the Securities Act of 1933, as amended, or the Securities Act, of the Resale Shares that they are offering pursuant to this prospectus.

You should carefully read this prospectus and any applicable prospectus supplement before you invest in any of the securities being offered.

Our Common Stock is traded on the Nasdaq Global Market under the symbol “RNAC.” On December 12, 2024, the last reported sale price for our Common Stock was \$20.12 per share.

Investing in our securities involves a high degree of risk. Before investing in our securities, you should carefully consider the risks and uncertainties described under the caption “*Risk Factors*” beginning on page 9 of this prospectus and any similar section contained in the applicable prospectus supplement and in any free writing prospectus we have authorized for use in connection with a specific offering, and under similar headings in the documents incorporated by reference into this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is , .

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the SEC using a “shelf” registration process. Under this shelf registration process, the Selling Stockholders may, from time to time, sell the securities described in this prospectus in one or more offerings.

This prospectus contains information that you should consider when making your investment decision. Neither we nor the Selling Stockholders have authorized anyone to provide you with information that is different from or in addition to the information contained in this prospectus or in any applicable prospectus supplement or in any related free writing prospectus prepared by or on behalf of us or to which we have referred you. Accordingly, neither we nor any Selling Stockholder takes any responsibility for, or can provide any assurance as to the reliability of, any information that others may give. The Selling Stockholders are offering to sell, and seeking offers to buy, our securities only in jurisdictions where it is lawful to do so. This prospectus and any accompanying prospectus supplement do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the securities described in any accompanying prospectus supplement or an offer to sell or the solicitation of an offer to buy such securities in any circumstances in which such offer or solicitation is unlawful. You should assume that the information appearing in this prospectus, any prospectus supplement and any related free writing prospectus is accurate only as of their respective dates. Our business, financial condition, results of operations and prospects may have changed materially since those dates.

We may also provide a prospectus supplement or post-effective amendment to the registration statement to add information to, or update or change information contained in, this prospectus. You should read this prospectus and any applicable prospectus supplement or post-effective amendment to the registration statement together with the additional information to which we refer you in the section of this prospectus titled “*Where You Can Find More Information.*”

When we refer to “Cartesian,” “we,” “our,” “us” and the “Company” in this prospectus, we mean Cartesian Therapeutics, Inc. and its consolidated subsidiaries, unless otherwise specified.

This prospectus, including the documents incorporated by reference into this prospectus, also includes trademarks, tradenames and service marks of others, which are the property of their respective owners. Solely for convenience, trademarks and tradenames referred to in this prospectus may appear without the ® and ™ symbols.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein contain “forward-looking statements” within the meaning of Section 27A of the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. These forward-looking statements reflect our current views with respect to, among other things, future events and our financial performance. Any statements about our management’s expectations, beliefs, plans, predictions, forecasts, objectives, assumptions or future events or performance are not historical facts and may be forward-looking. These statements are often, but not always, made through the use of words or phrases such as “anticipate,” “believes,” “can,” “could,” “may,” “predicts,” “potential,” “should,” “will,” “estimate,” “plans,” “projects,” “continuing,” “ongoing,” “expects,” “intends” and similar words or phrases. All forward-looking statements, expressed or implied, included herewith are expressly qualified in their entirety by the cautionary statements contained or referred to herein. The inclusion of forward-looking information in this prospectus and the documents incorporated by reference herein should not be regarded as a representation by us or any other person that the future plans, estimates or expectations contemplated by us will be achieved. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our financial condition, results of operations, business strategy and financial needs. Factors that may affect our results are disclosed in “*Risk Factors*” beginning on page 9 of this prospectus, and in the documents incorporated by reference into this prospectus and included or incorporated by reference in this prospectus. Some of the risks and uncertainties that may cause our actual results, performance or achievements to differ materially from those expressed include, but are not limited to, the following:

- any future payouts under the contingent value right, or CVR, issued to our holders of record as of the close of business on December 4, 2023;
- our ability to achieve the expected benefits or opportunities and related timing with respect to the Merger (as defined below) or to monetize any of our legacy assets;
- our future results of operations and financial position, business strategy, and the length of time that we believe our existing cash resources will fund our operations;
- our market size and our potential growth opportunities;
- our preclinical and clinical development activities;
- the efficacy and safety profile of our product candidates;
- the potential therapeutic benefits and economic value of our product candidates;
- the timing and results of preclinical studies and clinical trials;
- the expected impact of macroeconomic conditions, including inflation, increasing interest rates and volatile market conditions, current or potential bank failures;
- global events, including the ongoing conflicts between Russia and Ukraine and between Hamas and Israel and geopolitical tensions in China on our operations;
- the receipt and timing of potential regulatory designations, approvals and commercialization of product candidates;
- potential litigation related to the Merger instituted against us or our directors;
- our ability to prevent or minimize the effects of litigation and other contingencies;
- our status as a preclinical and development-stage company and our expectation to incur losses in the future, and the possibility that we never achieve or maintain profitability;
- uncertainties with respect to our ability to access future capital;
- our ability to maximize the value of our pipeline of product candidates;
- our unproven approach to therapeutic intervention;
- our ability to enroll patients in clinical trials, timely and successfully complete those trials and receive necessary regulatory approvals;

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- our ability to continue to grow our manufacturing capabilities and resources;
- our ability to manufacture our product candidates, which in some cases are manufactured on a patient-by-patient basis;
- our ability to access manufacturing facilities and to receive or manufacture sufficient quantities of our product candidates;
- our ability to maintain our existing or future collaborations or licenses and to seek new collaborations, licenses or partnerships;
- the impact of resurgence of the COVID-19 pandemic on our operations, the continuity of our business, including our preclinical studies and clinical trials, and general economic conditions;
- our ability to protect and enforce our intellectual property rights;
- federal, state, and foreign regulatory requirements, including U.S. Food and Drug Administration, or FDA, regulation of our product candidates;
- our ability to obtain and retain key executives and retain qualified personnel; and
- developments relating to our competitors and our industry, including the impact of government regulation.

The foregoing list may not contain all of the forward-looking statements made in this prospectus.

These forward-looking statements are only predictions based on our current expectations and projections about future events and are subject to a number of risks, uncertainties and assumptions, including those described in “*Risk Factors*” and elsewhere in this prospectus. Moreover, we operate in a competitive industry, and new risks emerge from time to time. It is not possible for the management of Cartesian to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed in this prospectus may not occur, and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements in this prospectus.

The forward-looking statements included in this prospectus are made only as of the date hereof. You should not rely upon forward-looking statements as predictions of future events. Although we believe that the expectations reflected in our forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance or events and circumstances reflected in the forward-looking statements will be achieved or occur. We do not undertake any obligation to update publicly any forward-looking statements for any reason after the date of this prospectus to conform these statements to actual results or to changes in expectations, except as required by law.

You should read this prospectus, the documents that have been filed as exhibits to the registration statement of which this prospectus forms a part, any accompanying prospectus supplement, and the documents incorporated by reference herein and therein with the understanding that the actual future results, levels of activity, performance, events and circumstances of Cartesian may be materially different from what is expected.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities being offered by this prospectus. This prospectus, which constitutes part of the registration statement, does not contain all of the information in the registration statement and its exhibits. For further information with respect to us and our securities offered by this prospectus, we refer you to the registration statement and its exhibits. Statements contained in this prospectus as to the contents of any document referred to are not necessarily complete, and in each instance, we refer you to the copy of the document filed as an exhibit to the registration statement. Each of these statements is qualified in all respects by this reference. You can read our SEC filings, including the registration statement, at the SEC's website at www.sec.gov.

We are subject to the information reporting requirements of the Exchange Act, and we file reports, proxy statements and other information with the SEC. These reports, proxy statements and other information are available for review at the SEC's website at www.sec.gov. We also maintain a website at www.cartesiantherapeutics.com, at which you may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. Cartesian's website and the information contained on, or that can be accessed through, such website are not deemed to be incorporated by reference in, and are not considered part of, this prospectus.

INCORPORATION BY REFERENCE

The SEC allows us to “incorporate by reference” into this prospectus the information in certain documents we file with the SEC, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be a part of this prospectus. When we update the information contained in documents that have been incorporated by reference by making future filings with the SEC, the information incorporated by reference into this prospectus is considered to be automatically updated and superseded. In other words, in all cases, if you are considering whether to rely on information contained in this prospectus or information incorporated by reference into this prospectus, you should rely on the information contained in the document that was filed later. We incorporate by reference (other than any information furnished to, rather than filed with, the SEC, unless expressly stated otherwise therein) the documents listed below (File No. 001-37798 unless otherwise stated), which are considered to be a part of this prospectus:

- Our Annual Report on Form 10-K for the year ended December 31, 2023, filed with the SEC on [March 7, 2024](#).
- The information specifically incorporated by reference into our Annual Report on Form 10-K from our Definitive Proxy Statement on Schedule 14A relating to our 2024 Annual Meeting of Stockholders, filed with the SEC on [April 26, 2024](#).
- Our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2024, June 30, 2024, and September 30, 2024, filed with the SEC on [May 8, 2024](#), [August 8, 2024](#), and [November 7, 2024](#), respectively.
- Our Current Reports on Form 8-K (or amendments thereto) filed with the SEC on [January 19, 2024](#), [January 23, 2024](#), [March 5, 2024](#) (except for Item 7.01 and Exhibit 99.1 thereto), [March 14, 2024](#), [March 28, 2024](#) (except for Item 7.01 and Exhibit 99.1 thereto), [April 1, 2024](#), [April 9, 2024](#) (except for Item 7.01 and Exhibit 99.1 thereto), [April 22, 2024](#), [May 22, 2024](#) (except for Item 7.01 and Exhibit 99.1 thereto), [June 17, 2024](#), [July 2, 2024](#) (except for Item 7.01 and Exhibits 99.1 and 99.2 thereto), [September 23, 2024](#), [September 26, 2024](#) and [December 3, 2024](#) (except for Item 7.01 and Exhibits 99.1 and 99.2 thereto).
- The description of our Common Stock contained in our Registration Statement on Form 8-A, filed with the SEC on June 8, 2016, as amended by the description of our Common Stock contained in [Exhibit 4.14](#) to our Annual Report on Form 10-K for the year ended December 31, 2023, filed with the SEC on March 7, 2024, and any further amendment or report filed with the SEC for the purpose of updating such description.

All reports and other documents we subsequently file with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act until our offering is completed, including all such reports and other documents filed with the SEC after the date of the initial filing of the registration statement of which this prospectus forms a part and prior to the effectiveness of such registration statement, will also be incorporated by reference into this prospectus and deemed to be part hereof (other than any information furnished to, rather than filed with, the SEC, unless expressly stated otherwise therein). The information contained in any such filing will be deemed to be a part of this prospectus commencing on the date on which the document is filed.

You may request a free copy of any of the documents incorporated by reference in this prospectus by writing or telephoning us at the following address:

Cartesian Therapeutics Inc.
7495 New Horizon Way
Frederick, MD 21703
(301) 348-8698

Exhibits to the filings will not be sent, however, unless those exhibits have specifically been incorporated by reference in this prospectus or any accompanying prospectus supplement.

THE COMPANY

We are a clinical-stage biotechnology company developing mRNA cell therapies for the treatment of autoimmune diseases. We leverage our proprietary technology and manufacturing platform to introduce one or more mRNA molecules into cells to enhance their function. Unlike DNA, mRNA degrades naturally over time without integrating into the cell's genetic material. Therefore, our mRNA cell therapies are distinguished by their capacity to be dosed repeatedly like conventional drugs, administered in an outpatient setting, and given without pre-treatment chemotherapy required with many conventional cell therapies. In an open-label Phase 2 clinical trial in patients with myasthenia gravis, or MG, a chronic autoimmune disease that causes disabling muscle weakness and fatigue, we observed that our lead product candidate, Descartes-08, generated a deep and durable clinical benefit, with all seven participants maintaining improvements in MG severity scales considered clinically meaningful by expert consensus at nine months, and five of the seven participants maintaining improvements in MG severity scales considered clinically meaningful by expert consensus at 12 months. Durability of response in MG is commonly measured over a period of 26 to 52 weeks, and maintenance of response over that period is considered durable.

Our mRNA CAR-T modality is a personalized approach that collects a patient's T-cells and uses mRNA to introduce a CAR into the cell. The CAR redirects the T-cells to target and destroy pathogenic self-reactive cells. Our mRNA in situ modality is designed to deliver mRNA into a patient's lymph node to generate CAR-T cells and other proteins that target autoimmunity.

We filed our certificate of incorporation with the Secretary of State of Delaware on December 10, 2007. On November 13, 2023, the Company and the Delaware corporation which, immediately prior to the Merger, was known as Cartesian Therapeutics, Inc., or Old Cartesian, entered into an Agreement and Plan of Merger, or the Merger Agreement, by and among the Company, Sakura Merger Sub I, Inc., a Delaware corporation and a wholly owned subsidiary of the Company, or First Merger Sub, Sakura Merger Sub II, LLC, a Delaware limited liability company and wholly owned subsidiary of the Company, or Second Merger Sub, and Old Cartesian. Pursuant to the Merger Agreement, and simultaneously with execution thereof, (i) First Merger Sub merged with and into Old Cartesian, pursuant to which Old Cartesian was the surviving corporation, or the First Step Surviving Corporation, and became a wholly owned subsidiary of the Company, or the First Merger, and (ii) immediately following the First Merger, Old Cartesian (as the First Step Surviving Corporation) merged with and into Second Merger Sub, pursuant to which Second Merger Sub was the surviving company, or the Surviving Company, and continued under the name "Cartesian Bio, LLC", or the Second Merger and, together with the First Merger, the Merger. In connection with the Merger and pursuant to the Merger Agreement, the Company (which was known as Selecta Biosciences, Inc. until immediately prior to the Merger) changed its corporate name to Cartesian Therapeutics, Inc.

Our principal executive offices are located at 7495 New Horizon Way, Frederick, MD 21703, and our telephone number is (301) 348-8698.

THE OFFERING

Shares Offered by the Selling Stockholders	Up to 11,392,350 shares of Common Stock, consisting of the Merger Common Shares, the Merger Conversion Shares and the Private Placement Conversion Shares.
Terms of the Offering	The Selling Stockholders will determine when and how they will dispose of the shares of Common Stock and shares of Common Stock issuable upon conversion of Series A Preferred Stock registered under this prospectus for resale.
Shares Outstanding	As of September 30, 2024, there were 23,896,525 shares of our Common Stock, 166,341.592 shares of Series A Preferred Stock and 437,927 shares of our Series B Non-Voting Convertible Preferred Stock, par value \$0.0001 per share, or Series B Preferred Stock, outstanding.
Use of Proceeds	We will not receive any proceeds from the sale of the Resale Shares offered by the Selling Stockholders under this prospectus. The net proceeds from the sale of the Resale Shares offered by this prospectus will be received by the Selling Stockholders. See the section titled “ <i>Use of Proceeds.</i> ”
Risk Factors	See the section titled “ <i>Risk Factors</i> ” and other information included in this prospectus for a discussion of factors that you should consider carefully before deciding to invest in our securities.
Trading Markets and Ticker Symbols	Our Common Stock is listed on the Nasdaq Global Market under the symbol “RNAC.”

The number of shares of our Common Stock outstanding is based on 23,896,525 shares of our Common Stock outstanding as of September 30, 2024. The number of shares outstanding as of September 30, 2024 excludes as of such date:

- 5,544,719 shares of Common Stock issuable upon the conversion of 166,341.592 shares of Series A Preferred Stock outstanding as of September 30, 2024;
- 437,927 shares of Common Stock issuable upon the conversion of 437,927 shares of Series B Preferred Stock outstanding as of September 30, 2024;
- 586,800 shares of Common Stock issuable upon the exercise of stock options outstanding as of September 30, 2024, at a weighted-average exercise price of \$19.66 per share under our Amended and Restated 2016 Incentive Award Plan, or the 2016 Incentive Award Plan, of which 12,386 options were vested as of September 30, 2024;
- 256,666 shares of Common Stock issuable upon the exercise of stock options outstanding as of September 30, 2024, at a weighted-average exercise price of \$20.10 per share under our Amended and Restated 2018 Employment Inducement Incentive Award Plan, or the Inducement Plan, of which no options were vested as of September 30, 2024;
- 1,128,723 shares of Common Stock issuable upon the exercise of stock options outstanding as of September 30, 2024, at a weighted-average exercise price of \$2.72 per share under the Cartesian Therapeutics, Inc. 2016 Stock Incentive Plan, or the 2016 Stock Incentive Plan, of which 964,490 options were vested as of September 30, 2024;
- 334,692 shares of Common Stock issuable upon the vesting of restricted stock units outstanding as of September 30, 2024, at a weighted-average grant price of \$19.88 under the 2016 Incentive Award Plan, of which no restricted stock units were vested as of September 30, 2024;

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- 113,519 shares of Common Stock issuable upon the vesting of restricted stock units outstanding as of September 30, 2024, at a weighted-average grant price of \$19.80 under the 2016 Stock Incentive Plan, of which no restricted stock units were vested as of September 30, 2024;
- 974,954 shares of Common Stock issuable upon the exercise of warrants outstanding as of September 30, 2024, at a weighted average exercise price of \$46.04 per share;
- 3,511,101 shares of Common Stock reserved for issuance as of September 30, 2024 under the 2016 Incentive Award Plan;
- 27,270 shares of Common Stock reserved for issuance as of September 30, 2024 under the 2016 Stock Incentive Plan;
- 253,377 shares of Common Stock reserved for issuance as of September 30, 2024 under the Inducement Plan; and
- 45,795 shares of Common Stock reserved for issuance as of September 30, 2024 pursuant to our 2016 Employee Stock Purchase Plan.

For additional information concerning the offering, see the section titled “*Plan of Distribution.*”

RISK FACTORS

Investing in securities issued by us involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully the risks described under the heading “*Risk Factors*” in any of our filings with the SEC that are incorporated by reference herein.

USE OF PROCEEDS

We are not selling any securities under this prospectus and we will not receive any proceeds from the sale of the Resale Shares covered hereby. The net proceeds from the sale of the Resale Shares offered by this prospectus will be received by the Selling Stockholders.

Subject to limited exceptions, the Selling Stockholders will pay any underwriting discounts and commissions and expenses incurred by the Selling Stockholders for brokerage, accounting, tax or legal services or any other expenses incurred by the Selling Stockholders in disposing of any of the Resale Shares. We will bear the costs, fees and expenses incurred in effecting the registration of the Resale Shares covered by this prospectus, including all registration and filing fees, listing fees of the Nasdaq Stock Market LLC and fees and expenses of our counsel and our independent registered public accounting firm.

DESCRIPTION OF CAPITAL STOCK

The following description of our capital stock is not complete and may not contain all the information you should consider before investing in our capital stock. This description is summarized from, and qualified in its entirety by reference to, our restated certificate of incorporation, as amended, or the Charter, our amended and restated by-laws, or the Bylaws, and the applicable provisions of the Delaware General Corporation Law, or the DGCL. Each of our Charter and Bylaws is filed as an exhibit to the registration statement of which this prospectus forms a part.

General

As of the date of this prospectus, our authorized capital stock consists of 360,000,000 shares, comprised of 350,000,000 shares of Common Stock and 10,000,000 shares of preferred stock, \$0.0001 par value per share. As of September 30, 2024 there were 23,896,525 shares of our Common Stock outstanding and 604,268,592 shares of preferred stock outstanding, of which (i) 166,341,592 were designated as Series A Preferred Stock, and are convertible into 5,544,719 shares of Common Stock and (ii) 437,927 were designated as Series B Preferred Stock, and are convertible into 437,927 shares of Common Stock.

Common Stock

Our Common Stock is listed on the Nasdaq Global Market under the symbol “RNAC.”

Voting Rights. Holders of our Common Stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders shall be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Subject to the supermajority votes for some matters, other matters shall be decided by the affirmative vote of our stockholders having a majority in voting power of the votes cast by the stockholders present or represented and voting on such matter. Our Charter and Bylaws also provide that our directors may be removed only for cause and only by the affirmative vote of the holders of at least two-thirds in voting power of the outstanding shares of capital stock entitled to vote thereon. In addition, the affirmative vote of the holders of at least a majority of the voting power of the outstanding shares of capital stock entitled to vote thereon is required to amend or repeal, or to adopt any provision inconsistent with, several of the provisions of our Charter.

Rights upon Liquidation. In the event of our liquidation or dissolution, the holders of Common Stock are entitled to receive proportionately our net assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock

Dividend Rights. Holders of Common Stock are entitled to receive proportionately any dividends as may be declared by our board of directors, or the Board of Directors, subject to any preferential dividend rights of outstanding preferred stock.

Other Rights. Holders of Common Stock have no preemptive, subscription, redemption or conversion rights. The rights, preferences and privileges of holders of Common Stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Preferred Stock

Pursuant to the Charter, the Board of Directors has the authority, without stockholder approval, subject to limitations prescribed by law, to provide for the issuance of up to 10,000,000 shares of preferred stock in one or more series, and by filing a certificate pursuant to the applicable law of the State of Delaware, to establish from time to time the number of shares to be included in each such series, and to fix the voting rights, if any, designations, powers, preferences and relative, participating, optional, special and other rights of the shares of each series and any qualifications, limitations or restrictions thereof.

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We will fix the voting rights, designations, preferences and rights of the preferred stock of each series, as well as the qualifications, limitations or restrictions thereof, in the certificate of designation relating to such series. We will file an exhibit to the registration statement of which any prospectus relating to offers and sales of any such preferred stock forms a part, or will incorporate by reference from reports that we file with the SEC, the form of any certificate of designation that describes the terms of the series of preferred stock we are offering before the issuance of that series of preferred stock. This description will include:

- the title and stated value;
- the number of shares offered;
- the liquidation preference per share;
- the purchase price per share;
- the dividend rate(s), period(s) and/or payment date(s) or method(s) of calculation for dividends;
- whether dividends are cumulative or non-cumulative and, if cumulative, the date from which dividends will accumulate;
- our right, if any, to defer payment of dividends and the maximum length of such deferral period;
- the procedures for auction and remarketing, if any;
- the provisions for a sinking fund, if any;
- the provision for redemption or repurchase, if applicable, and any restrictions on our ability to exercise those redemption and repurchase rights;
- any listing of the preferred stock on any securities exchange or market;
- the terms and conditions, if applicable, upon which the preferred stock will be convertible into Common Stock, including the conversion price (or manner of calculation) and conversion period;
- whether the preferred stock will be exchangeable into debt securities, and, if applicable, the exchange price, or how it will be calculated, and the exchange period;
- voting rights, if any, of the preferred stock;
- preemptive rights, if any;
- restrictions on transfer, sale or other assignment, if any;
- whether interests in the preferred stock will be represented by depositary shares;
- a discussion of any material and/or special U.S. federal income tax considerations applicable to the preferred stock;
- the relative ranking and preferences of the preferred stock as to dividend rights and rights upon the liquidation, dissolution or winding up of our affairs;
- any limitations on issuance of any class or series of preferred stock ranking senior to or on a parity with the class or series of preferred stock as to dividend rights and rights upon liquidation, dissolution or winding up of our affairs; and
- any other specific terms, preferences, rights, limitations or restrictions of the preferred stock.

Our Board of Directors could authorize the issuance of shares of preferred stock with terms and conditions that could have the effect of discouraging a takeover or other transaction that might involve a premium price for holders of the shares or which holders might believe to be in their best interests. The issuance of preferred stock could adversely affect the voting power, conversion or other rights of holders of Common Stock and reduce the likelihood that common stockholders will receive dividend payments and payments upon liquidation.

The laws of the State of Delaware provide that the holders of preferred stock will have the right to vote separately as a class on any proposal involving fundamental changes to the rights of holders of such preferred stock. This right is in addition to any voting rights that may be provided for in the applicable certificate of designations.

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The transfer agent and registrar for any series of preferred stock will be set forth in the applicable prospectus supplement.

Series A Preferred Stock

Conversion. The outstanding shares of Series A Preferred Stock may convert into shares of Common Stock, subject to certain beneficial ownership limitations, including that a holder of Series A Preferred Stock (except for any holder of Series A Preferred Stock who beneficially owned greater than 19.9% of our Common Stock immediately prior to the Merger) is prohibited from converting shares of Series A Preferred Stock into shares of Common Stock if, as a result of such conversion, such holder, together with its affiliates, would beneficially own more than a specified percentage (to be established by the holder between 0% and 19.9%) of the total number of shares of Common Stock issued and outstanding immediately after giving effect to such conversion, or the Series A Beneficial Ownership Limitation. Each outstanding share of Series A Preferred Stock is convertible, at any time and from time to time, at the option of the holder thereof, into 33.333 shares of Common Stock, subject to the Series A Beneficial Ownership Limitation and only to the extent the same shall have ceased to apply.

Voting Rights. Except as otherwise required by law (e.g., voting on a change to the authorized shares of Series A Preferred Stock or the rights of such shares as required by the DGCL) and the Certificate of Designation of Preferences, Rights and Limitations of the Series A Preferred Stock, or the Series A Certificate of Designation, the Series A Preferred Stock does not have voting rights. However, as long as any shares of Series A Preferred Stock are outstanding, we will not, without the affirmative vote of the holders of a majority of the then outstanding shares of the Series A Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Series A Preferred Stock, (b) alter or amend the Series A Certificate of Designation, (c) amend the Charter or other organizational documents in any matter that adversely affects any rights of the holders of Series A Preferred Stock, (d) issue further shares of Series A Preferred Stock (other than in connection with the exercise of assumed Cartesian options to purchase shares of Series A Preferred Stock), (e) at any time while at least 30% of the originally issued Series A Preferred Stock remains issued and outstanding, consummate either (A) a Fundamental Transaction (as defined in the Series A Certificate of Designation) or (B) any merger or consolidation of the Company or other business combination in which our stockholders immediately before such transaction do not hold at least a majority of our capital stock immediately after such transaction, (f) amend or fail to comply with, in any manner that would be reasonably likely to prevent, impede or materially delay the conversion (or the stockholder approval thereof), or terminate, any of the support agreements entered into in connection with the Merger, or the Support Agreements, or agree to any transfer, sale or disposition of such shares subject to the Support Agreements (except for such transfers, sales or dispositions with respect to which the approval of the Company is not required pursuant to the applicable Support Agreement) or (g) enter into any agreement with respect to any of the foregoing.

Dividends. Holders of Series A Preferred Stock are entitled to receive non-cumulative dividends on shares of Series A Preferred Stock equal, on an as-if-converted-to-Common-Stock basis, and in the same form as dividends actually paid on shares of the Common Stock.

Liquidation and Dissolution. The Series A Preferred Stock ranks on parity with Common Stock and Series B Preferred Stock upon any liquidation, dissolution or winding-up of the Company.

Preemptive Rights. The Series A Preferred Stock does not have preemptive rights.

Transferability. The Series A Certificate of Designation does not contain any restrictions upon the transfer of the Series A Preferred Stock.

Series B Preferred Stock

Conversion. The outstanding shares of Series B Preferred Stock may convert into shares of Common Stock, subject to certain beneficial ownership limitations, including that a holder of Series B Preferred Stock (except for any holder of Series B Preferred Stock who beneficially owned greater than 19.9% of our Common Stock immediately prior to 2024 Private Placement (as defined below)) is prohibited from converting shares of Series B Preferred Stock into shares of Common Stock if, as a result of such conversion, such holder, together with its affiliates, would beneficially own more than a specified percentage (to be established by the holder between 0% and 19.9%) of the total number of shares of Common Stock issued and outstanding immediately after giving effect to such conversion, or the Series B Beneficial Ownership Limitation. Each outstanding share of Series B

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Preferred Stock is convertible, at any time and from time to time, at the option of the holder thereof, into one share of Common Stock, subject to the Series B Beneficial Ownership Limitation and only to the extent the same shall have ceased to apply.

Voting Rights. Except as otherwise required by law (e.g., voting on a change to the authorized shares of Series B Preferred Stock or the rights of such shares as required by the DGCL) and the Certificate of Designation of Preferences, Rights, and Limitations of the Series B Preferred Stock, or the Series B Certificate of Designation, the Series B Preferred Stock does not have voting rights. However, as long as any shares of Series B Preferred Stock are outstanding, we will not, without the affirmative vote of the holders of a majority of the then outstanding shares of the Series B Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Series B Preferred Stock, (b) alter or amend the Series B Certificate of Designation, or (c) amend the Charter or other organizational documents in any matter that adversely affects any rights of the holders of Series B Preferred Stock.

Dividends. Holders of Series B Preferred Stock are entitled to receive non-cumulative dividends on shares of Series B Preferred Stock equal, on an as-if-converted-to-Common-Stock basis, and in the same form as dividends actually paid on shares of the Common Stock.

Liquidation and Dissolution. The Series B Preferred Stock ranks on parity with Common Stock and Series A Preferred Stock upon any liquidation, dissolution or winding-up of the Company.

Preemptive Rights. The Series B Preferred Stock does not have preemptive rights.

Transferability. The Series B Certificate of Designation does not contain any restrictions upon the transfer of the Series B Preferred Stock.

Registration Rights

Certain holders of our Common Stock or their transferees are entitled to the following rights with respect to the registration of such shares for public resale under the Securities Act.

These registration rights are granted pursuant to (i) a registration rights agreement, or the 2024 RRA, we entered into in June 2024 in connection with the 2024 Private Placement, (ii) a registration rights agreement, or the 2023 RRA, we entered into in November 2023 in connection with the Transactions, and (iii) a registration rights agreement, or the 2020 RRA, we entered into in connection with the private placement of our Common Stock, which closed on July 31, 2020.

2024 RRA

On July 2, 2024, we entered into the 2024 RRA with the purchasers party thereto. Pursuant to the 2024 RRA, we were obligated to prepare and file a resale registration statement with the SEC within 30 days of July 3, 2024 and to use our reasonable best efforts to cause such registration statement to be declared effective by the SEC within 90 calendar days of July 3, 2024 (or within 120 calendar days of July 3, 2024 if the SEC reviews the registration statement).

We also agreed, among other things, to indemnify the purchasers party thereto and each of their respective officers, directors, agents, partners, members, managers, stockholders, affiliates, investment advisers and employees, each person who controls any such purchaser party and the officers, directors, partners, members, managers, stockholders, agents, investment advisers and employees of each such controlling person from certain liabilities and pay all fees and expenses (excluding any legal fees of the selling holder(s), and any underwriting discounts and selling commissions) incident to our obligations under the 2024 RRA.

Securities of a holder cease to be registrable securities under the 2024 RRA upon the earlier to occur of the following: (A) a sale pursuant to a registration statement or Rule 144 under the Securities Act; and (B) the time such shares become eligible for resale by such holder under Rule 144 without the requirement for the Company to be in compliance with the current public information required by Rule 144(c) and Rule 144(i)(2) and without volume or manner-of-sale restrictions, pursuant to a written opinion letter of counsel for the Company to such effect, addressed, delivered and reasonably acceptable to the Company's transfer agent.

2023 RRA

In connection with the Transactions, we entered into the 2023 RRA, pursuant to which we agreed to prepare and file a resale registration statement with the SEC within 90 calendar days following November 15, 2023, with

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respect to the Private Placement Conversion Shares, the Merger Common Shares, and the Merger Conversion Shares. We also agreed to use our commercially reasonable efforts to cause such registration statement to be declared effective by the SEC by March 29, 2024 (or by May 13, 2024 if the SEC reviews the registration statement). The parties to the 2023 RRA previously waived these registration requirements during the period in which we were not eligible to use Form S-3 to register resales of the registrable securities under the 2023 RRA, and one signatory to the 2023 RRA has irrevocably waived such registration requirements. The registration statement of which this prospectus forms a part is intended to satisfy our remaining registration obligations with respect to the Resale Shares pursuant to the 2023 RRA.

We also agreed to, among other things, indemnify the holders of Common Stock and Series A Preferred Stock signatory thereto, their officers, directors, members, employees, partners, managers, stockholders, affiliates, investment advisors and agents under such registration statement from certain liabilities and pay all fees and expenses (excluding any legal fees of the selling holder(s), and any underwriting discounts and selling commissions) incident to our obligations under the 2023 RRA.

Securities of a holder cease to be registrable securities under the 2023 RRA upon the earlier to occur of the following: (A) a sale pursuant to a registration statement or Rule 144 under the Securities Act; and (B) the time such shares become eligible for resale by such holder under Rule 144 without the requirement for the Company to be in compliance with the current public information required thereunder and without volume or manner-of-sale restrictions, pursuant to a written opinion letter of counsel for the Company to such effect, addressed, delivered and reasonably acceptable to the Company's transfer agent.

2020 RRA

Holders of registrable securities under the 2020 RRA have registration rights until the earlier of (i) such time as there are no longer any registrable securities held by the purchaser, its affiliates or permitted transferees and (ii) such time as all of the securities can otherwise be sold without regard to the volume or manner-of-sale restrictions pursuant to Rule 144. The registration of shares of Common Stock as a result of the following rights being exercised would enable holders to trade these shares without restriction under the Securities Act when the applicable registration statement is declared effective.

Piggyback Registration Rights. Any time we propose to register any shares of our Common Stock under the Securities Act, subject to certain exceptions, the holders of registrable securities are entitled to notice of the registration and to include their shares of registrable securities in the registration. If our proposed registration involves an underwriting, the managing underwriter of such offering will have the right to limit the number of shares to be underwritten for reasons related to the marketing of the shares.

Demand Registration Rights. If the holders of registrable securities request in writing that we effect a registration with respect to all of the registrable securities, we will be required to effect such registration.

Expenses. Ordinarily, other than underwriting discounts and commissions, we will be required to pay all expenses incurred by us related to any registration effected pursuant to the exercise of these registration rights. These expenses may include all registration and filing fees, printing expenses, fees and disbursements of our counsel, reasonable fees and disbursements of a counsel for the selling security holders and blue sky fees and expenses.

Termination of Registration Rights. The registration rights terminate upon the earlier of (i) such time as there are no longer any registrable securities held by the purchaser, its affiliates or permitted transferees and (ii) such time as all of the securities can otherwise be sold without regard to the volume or manner-of-sale restrictions pursuant to Rule 144.

Anti-Takeover Effects of Delaware Law and Our Charter and Bylaws

Some provisions of the DGCL, our Charter and our Bylaws could make the following transactions more difficult: an acquisition of us by means of a tender offer; an acquisition of us by means of a proxy contest or otherwise; or the removal of our incumbent officers and directors. It is possible that these provisions could make it more difficult to accomplish or could deter transactions that stockholders may otherwise consider to be in their best interest or in our best interest, including transactions which provide for payment of a premium over the market price for our shares.

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These provisions, summarized below, are intended to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our Board of Directors. We believe that the benefits of the increased protection of our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us outweigh the disadvantages of discouraging these proposals because negotiation of these proposals could result in an improvement of their terms.

Undesignated Preferred Stock. The ability of our Board of Directors, without action by the stockholders, to issue up to 10,000,000 shares of undesignated preferred stock with voting or other rights or preferences as designated by our Board of Directors could impede the success of any attempt to effect a change in control of us. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of our company.

Stockholder Meetings. Our Bylaws provide that a special meeting of stockholders may be called only by our chairman of the board, chief executive officer or president (in the absence of a chief executive officer), or by a resolution adopted by a majority of our Board of Directors.

Requirements for Advance Notification of Stockholder Nominations and Proposals. Our Bylaws establish advance notice procedures with respect to stockholder proposals to be brought before a stockholder meeting and the nomination of candidates for election as directors, other than nominations made by or at the direction of the Board of Directors or a committee of the Board of Directors.

Elimination of Stockholder Action by Written Consent. Our Charter eliminates the right of stockholders to act by written consent without a meeting.

Staggered Board. Our Board of Directors is divided into three classes. The directors in each class will serve for a three-year term, one class being elected each year by our stockholders. This system of electing and removing directors may tend to discourage a third party from making a tender offer or otherwise attempting to obtain control of us, because it generally makes it more difficult for stockholders to replace a majority of the directors.

Removal of Directors. Our Charter provides that no member of our Board of Directors may be removed from office by our stockholders except for cause and, in addition to any other vote required by law, upon the approval of the holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote in the election of directors.

Stockholders Not Entitled to Cumulative Voting. Our Charter does not permit stockholders to cumulate their votes in the election of directors. Accordingly, the holders of a majority of the outstanding shares of our Common Stock entitled to vote in any election of directors can elect all of the directors standing for election, if they choose, other than any directors that holders of our preferred stock may be entitled to elect.

Delaware Anti-Takeover Statute. We are subject to Section 203 of the DGCL, which prohibits persons deemed to be “interested stockholders” from engaging in a “business combination” with a publicly held Delaware corporation for three years following the date these persons become interested stockholders unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. Generally, an “interested stockholder” is a person who, together with affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation’s voting stock. Generally, a “business combination” includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. The existence of this law may have an anti-takeover effect with respect to transactions not approved in advance by the Board of Directors.

Choice of Forum. Our Charter provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for: (1) any derivative action or proceeding brought on our behalf; (2) any action asserting a claim of breach of a fiduciary duty or other wrongdoing by any of our directors, officers, employees or agents to us or our stockholders; (3) any action asserting a claim against us arising pursuant to any provision of the General Corporation Law of the State of Delaware or our Charter or Bylaws; or (4) any action asserting a claim governed by the internal affairs doctrine. Our Charter also provides that any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock will be deemed to have notice of and to have consented to this choice of

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forum provision. It is possible that a court of law could rule that the choice of forum provision contained in our Charter is inapplicable or unenforceable if it is challenged in a proceeding or otherwise. Investors cannot waive compliance with the federal securities laws and the rules and regulations thereunder. Section 22 of the Securities Act generally creates concurrent jurisdiction for state and federal courts over suits brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder. Section 27 of the Exchange Act creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder.

Amendment of Charter. The amendment of any of the above provisions in our Charter, except for the provision making it possible for our Board of Directors to issue preferred stock and the provision prohibiting cumulative voting, would require approval by holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote thereon.

The provisions of the DGCL, our Charter and our Bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our Common Stock that often result from actual or rumored hostile takeover attempts. These provisions may also have the effect of preventing changes in the composition of our Board of Directors and management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interest.

Transfer Agent and Registrar

The transfer agent and registrar for our Common Stock, Series A Preferred Stock, and Series B Preferred Stock is Equiniti Trust Company, LLC. The transfer agent's address is 6201 15th Avenue, Brooklyn, New York 11219, and its telephone number is (800) 937-5449.

Exchange Listing

Our Common Stock is listed on the Nasdaq Global Market under the symbol "RNAC." We have not applied to list the Series A Preferred Stock or the Series B Preferred Stock on any national securities exchange.

SELLING STOCKHOLDERS

This prospectus covers the resale or other disposition from time to time by the Selling Stockholders identified in the table below of up to an aggregate of 11,392,350 shares of our Common Stock, consisting of 110,123 Merger Common Shares, 6,304,558 Merger Conversion Shares issued or issuable upon conversion of 189,136.767 Merger Preferred Shares, and 4,977,669 Private Placement Conversion Shares issued or issuable upon the conversion of 149,330.115 Private Placement Preferred Shares. The Selling Stockholders may from time to time offer and sell any or all of the Resale Shares set forth below pursuant to this prospectus and any accompanying prospectus supplement.

On November 13, 2023, we entered into the Merger Agreement, pursuant to which we issued an aggregate of 224,099 shares of our Common Stock and 384,930.724 shares of our Series A Preferred Stock, and the Securities Purchase Agreement pursuant to which we issued and sold 149,330.115 shares of our Series A Preferred Stock for an aggregate purchase price of approximately \$60.25 million. Subsequently, 413,470.437 shares of Series A Preferred Stock have been converted into 13,782,324 shares of Common Stock. Each of the remaining outstanding 120,790.402 shares of Series A Preferred Stock is convertible into 33.333 shares of Common Stock, subject to certain beneficial ownership limitations. This prospectus covers the resale or other disposition by the Selling Stockholders or their pledgees, donees, transferees or other successors-in-interest that receive their shares after the date of this prospectus of up to the total number of shares of Common Stock and shares of Common Stock issued or issuable upon the conversion of the Series A Preferred Stock issued to the Selling Stockholders pursuant to the Merger Agreement and Securities Purchase Agreement, as the case may be. Throughout this prospectus, when we refer to the “Selling Stockholders,” we are referring to the purchasers under the Securities Purchase Agreement listed in the table below.

We are registering the Resale Shares to permit the Selling Stockholders and their pledgees, donees, transferees or other successors-in interest that receive their shares after the date of this prospectus to resell or otherwise dispose of the shares in the manner contemplated under “*Plan of Distribution*” herein.

Except as otherwise disclosed herein, the Selling Stockholders do not have, and within the past three years have not had, any position, office or other material relationship with us.

The following table sets forth the names of the Selling Stockholders, the number of shares of our Common Stock owned by the Selling Stockholders (assuming the conversion of all outstanding shares of Series A Preferred Stock held by such Selling Stockholder), the number of shares of our Common Stock that may be offered under this prospectus (which reflects the assumed conversion of all outstanding shares of Series A Preferred Stock) and the number of shares of our Common Stock that will be owned after this offering by the Selling Stockholders assuming all of the Resale Shares registered for resale hereby are sold, in each case as of November 22, 2024.

The Selling Stockholders may sell some, all or none of their Resale Shares. We do not know how long the Selling Stockholders will hold the Resale Shares before selling them, and we currently have no agreements, arrangements or understandings with the Selling Stockholders regarding the sale or other disposition of any of the Resale Shares. The Resale Shares covered hereby may be offered from time to time by the Selling Stockholders, provided that Resale Shares issued upon conversion of Series A Preferred Stock may only be offered after such shares of Series A Preferred Stock are converted to Common Stock pursuant to the terms of the Series A Certificate of Designation, subject to certain beneficial ownership limitations.

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The information set forth below is based upon information obtained from the Selling Stockholders and upon information in our possession regarding the issuance or potential issuance of the Merger Common Shares, Merger Conversion Shares, and Private Placement Conversion Shares. The percentages of Common Stock owned after the offering by each Selling Stockholder below are based on 25,725,306 shares of Common Stock outstanding as of November 22, 2024, and, for each Selling Stockholder, assumes the conversion of only the Series A Preferred Stock owned by such Selling Stockholder but not the Series A Preferred Stock owned by any other Selling Stockholder. The numbers of shares of Common Stock beneficially owned before and after the offering presented in the table below do not give effect to the Series A Beneficial Ownership Limitation.

Name of Selling Stockholders ⁽¹⁾	Common Stock Beneficially Owned Before Offering ⁽²⁾	Common Stock that May Be Offered Pursuant to Prospectus	Common Stock Beneficially Owned After Offering ⁽²⁾	
			Number	Percentage (%)
Entities affiliated with Timothy A. Springer, Ph.D. ⁽³⁾	9,481,816	4,957,015	4,524,801	17.5%
Seven One Eight Three Four Irrevocable Trust ⁽⁴⁾	6,435,335	6,435,335	—	—%

- (1) To our knowledge, unless otherwise indicated, all persons named in the table above have sole voting and investment power with respect to their shares of Common Stock. Unless otherwise indicated, the address of each beneficial owner listed below is 7495 New Horizon Way, Frederick, Maryland 21703.
- (2) “Beneficial ownership” is a term broadly defined by the SEC in Rule 13d-3 under the Exchange Act, and includes more than the typical form of stock ownership, that is, stock held in the person’s name. The term also includes what is referred to as “indirect ownership,” meaning ownership of shares as to which a person has or shares investment power. Notwithstanding the foregoing, the beneficial ownership amounts assume the sale of all Common Stock that may be offered pursuant to this prospectus without taking into account certain limitations, including the Series A Beneficial Ownership Limitation, of the total number of shares of Common Stock issued and outstanding immediately after giving effect to such conversion.
- (3) Based on information known to us, and consists of (i) 8,449,773 shares of Common Stock held directly by Timothy A. Springer, Ph.D., a member of our Board of Directors, (ii) 113,587 shares of Common Stock issuable upon exercise of underlying warrants exercisable within 60 days of November 22, 2024 held directly by Timothy A. Springer, Ph.D., (iii) 2,533 shares of Common Stock issuable upon exercise of outstanding options within 60 days of November 22, 2024 and held directly by Timothy A. Springer, Ph.D., (iv) 1,977 shares of Common Stock underlying restricted stock units vesting within 60 days of November 22, 2024, (v) 529,798 shares of Common Stock held by TAS Partners LLC, or TAS, an affiliate of Dr. Springer, directly, (vi) 33,408 shares of Common Stock issuable upon exercise of underlying warrants exercisable within 60 days of November 22, 2024 held by TAS directly, (vii) 330,695 shares of Common Stock held by Dr. Chafen Lu, Dr. Springer’s wife, and (viii) 20,045 shares of Common Stock issuable upon exercise of underlying warrants exercisable within 60 days of November 22, 2024 held by Dr. Chafen Lu. Dr. Springer is the sole managing member of TAS. Dr. Springer exercises sole voting and dispositive power over the shares held by him directly and the shares held by TAS. Dr. Springer disclaims beneficial ownership of the shares held by TAS. Dr. Lu exercises sole voting and dispositive power over the shares held by her directly. The principal business address of each of Dr. Springer, TAS, and Dr. Lu is 36 Woodman Road, Newton, MA, 02467.
- (4) Based on information known to us, and consists of (i) 4,555,260 shares of Common Stock held by the Seven One Eight Three Four Irrevocable Trust, or the Trust, and (ii) 1,880,075 shares of Common Stock underlying 56,402.254 shares of Series A Preferred Stock held by the Trust. The trustees of the Trust are Elizabeth Hoge and Sinan Kalayoglu, each of whom has shared voting and dispositive control over the shares of Common Stock and Series A Preferred Stock held by the Trust. Murat Kalayoglu, a member of our Board of Directors, has the power to remove and appoint new trustees of the Trust and, pursuant to a right of substitution, to acquire from the Trust the shares of Common Stock and Series A Preferred Stock held by the Trust in exchange for assets with an equal value to such shares. Accordingly, Dr. Kalayoglu may be deemed to have sole voting and dispositive power of the shares of Common Stock and Series A Preferred Stock held by the Trust. The ability of the shares of Series A Preferred Stock held by the Trust to convert into shares of Common Stock is subject to a beneficial ownership limitation, such that neither the Trust may convert shares of Series A Preferred Stock into Common Stock to the extent that doing so would result in Dr. Kalayoglu or the Trust beneficially owning greater than 19.9% of the Company’s outstanding Common Stock after giving effect to such conversion.

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Relationship with the Selling Stockholders

2024 Private Placement

Dr. Timothy A. Springer, TAS, and Dr. Springer's spouse, Dr. Chafen Lu, purchased shares of our Series B Preferred Stock in a private placement, which closed on July 3, 2024, or the 2024 Private Placement. The following table sets forth the number of shares of Series B Preferred Stock purchased in the 2024 Private Placement by such parties:

Name	Shares of Series B Preferred Stock Purchased	Total Aggregate Purchase Price
Timothy A. Springer, Ph.D.	1,636,832	\$32,736,640
TAS Partners LLC (affiliate of Timothy A. Springer, Ph.D.)	721,361	\$14,427,220
Chafen Lu, Ph.D.	1,307	\$ 26,140

In connection with the 2024 Private Placement, we entered into the 2024 RRA with Dr. Springer, TAS, Dr. Lu and the purchasers of shares of Series B Preferred Stock and Common Stock.

Warrant Exercise

On March 26, 2024, TAS exercised 65,681 warrants originally issued in 2019 (and amended in December 2022), paid the per-share exercise price of \$43.80 in cash for an aggregate exercise price of \$2.9 million, and received 65,681 shares of Common Stock and 1,970,443 CVRs.

2023 Private Placement

In the 2023 Private Placement, we entered into the Securities Purchase Agreement pursuant to which we issued and sold an aggregate of 149,330.115 shares of Series A Preferred Stock, each of which was converted or is convertible into 33.333 shares of Common Stock, for an aggregate purchase price of approximately \$60.25 million. Timothy A. Springer, Ph.D., one of the Selling Stockholders and a member of our Board of Directors, participated in the 2023 Private Placement and was party to the 2023 RRA. TAS is affiliated with Dr. Springer and TAS also participated in the 2023 Private Placement and was party to the 2023 RRA. The Trust is affiliated with Murat Kalayoglu, M.D., Ph.D., a member of our Board of Directors, and participated in the 2023 Private Placement and was party to the 2023 RRA. The following table sets forth the number of shares of Series A Preferred Stock purchased in the 2023 Private Placement by such parties:

Name	Shares of Series A Preferred Stock Purchased	Total Aggregate Purchase Price
Timothy A. Springer, Ph.D.	123,925.407	\$50,000,000
TAS Partners LLC (affiliate of Timothy A. Springer, Ph.D.)	24,785.081	\$10,000,000
Seven One Eight Three Four Irrevocable Trust (affiliate of Murat Kalayoglu, M.D., Ph.D.)	619.627	\$ 250,000

In the 2023 Private Placement, Dr. Timothy A. Springer agreed to settle his purchases in three tranches of shares of Series A Preferred Stock, the first for a purchase price of \$10.0 million and each thereafter for a purchase price of approximately \$20.0 million, with the three tranches settling 30, 60, and 90 days, respectively, following the closing of the transaction. TAS agreed to settle its purchase for approximately \$10.0 million within 30 days following the closing of the transaction. The first, second and third tranches were settled on December 13, 2023, January 12, 2024 and February 11, 2024, respectively, under which (i) 24,785.081 shares of Series A Preferred Stock were issued to each of TAS and Dr. Timothy A. Springer in the first tranche, (ii) 49,570.163 shares of Series A Preferred Stock were issued to Dr. Timothy A. Springer in the second tranche, and (iii) 49,570.163 shares of Series A Preferred Stock were issued to Dr. Timothy A. Springer in the third tranche. On November 15, 2023, we issued 619.627 shares of Series A Preferred Stock to Seven One Eight Three Four Irrevocable Trust for a purchase price of \$0.25 million.

Merger with Old Cartesian

On November 13, 2023, we acquired Old Cartesian, in accordance with the terms of the Merger Agreement. Under the terms of the Merger Agreement, following the consummation of the Merger, in exchange for the outstanding shares of capital stock of Old Cartesian immediately prior to the effective time of the First Merger,

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we issued to the stockholders of Old Cartesian that are “accredited investors,” as defined in Regulation D promulgated under the Securities Act, (A) 224,099 shares of Common Stock and (B) 384,930.724 shares of our Series A Preferred Stock. Each of the remaining outstanding 120,790.402 shares of Series A Preferred Stock is convertible into 33.333 shares of Common Stock, subject to certain beneficial ownership limitations.

As consideration in the Merger, Dr. Kalayoglu, together with his affiliated entities (including the Trust), collectively received an aggregate of 118,714 shares of Common Stock and 203,892.376 shares of Series A Preferred Stock.

In addition to the Securities Purchase Agreement, in connection with the Transactions, we entered into the 2023 RRA with the Selling Stockholders.

April 2022 Offering

In April 2022, we completed an SEC-registered securities offering pursuant to which we issued and sold an aggregate of 914,285 shares of our Common Stock and accompanying warrants to purchase 685,712 shares of our Common Stock, at a combined purchase price of \$42.30, for aggregate net proceeds to us of approximately \$36.9 million. In this offering, TAS purchased 222,720 shares of Common Stock and warrants to purchase 167,040 shares of Common Stock for a total purchase price of approximately \$9.4 million.

Support Agreements

In connection with the execution of the Merger Agreement, we and Old Cartesian entered into the Support Agreements with certain of our pre-Merger officers, directors and stockholders, including Dr. Springer and TAS. Pursuant to the Support Agreements, among other things, each of our pre-Merger stockholder parties thereto agreed to vote or cause to be voted all of the shares of Common Stock owned by such stockholder in favor of the proposals we submitted for stockholder approval at our March 2024 special meeting of stockholders.

Indemnification Agreements

We have entered into indemnification agreements with each of our directors and executive officers, including Drs. Springer and Kalayoglu. These agreements, among other things, require us or will require us to indemnify each director (and in certain cases their related venture capital funds) and executive officer to the fullest extent permitted by Delaware law, including indemnification of expenses such as attorneys’ fees, judgments, fines and settlement amounts incurred by a director or an executive officer in any action or proceeding, including any action or proceeding by or in right of us, arising out of such person’s services as a director or executive officer.

PLAN OF DISTRIBUTION

We are registering resales of Resale Shares to permit the sale, transfer or other disposition of the Resale Shares by the Selling Stockholders or their donees, pledgees, transferees or other successors-in-interest from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the Selling Stockholders of the Resale Shares. We will, or will procure to, bear all fees and expenses incident to our obligation to register the Resale Shares.

The Selling Stockholders may sell all or a portion of the Resale Shares beneficially owned by them and offered hereby from time to time, and in the case of shares of Common Stock issuable upon the conversion of the Series A Preferred Stock, may only be offered after such shares are converted to shares of Common Stock pursuant to the terms of the Series A Certificate of Designation, directly or through one or more underwriters, broker-dealers or agents. If the Resale Shares are sold through underwriters or broker-dealers, the Selling Stockholders will be responsible for underwriting discounts (it being understood that the Selling Stockholders shall not be deemed to be underwriters solely as a result of their participation in this offering) or commissions or agent's commissions. The Resale Shares may be sold on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale, in the over-the-counter market or in transactions otherwise than on these exchanges or systems or in the over-the-counter market and in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions. The Selling Stockholders may use any one or more of the following methods when selling Resale Shares:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- to or through underwriters or purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- settlement of short sales entered into after the effective date of the registration statement of which this prospectus is a part;
- broker-dealers may agree with the Selling Stockholders to sell a specified number of such Resale Shares at a stipulated price per share;
- through the writing or settlement of options or other hedging transactions, whether such options are listed on an options exchange or otherwise;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The Selling Stockholders also may resell all or a portion of the Resale Shares in open market transactions in reliance upon Rule 144 under the Securities Act, as permitted by that rule, or Section 4(a)(1) under the Securities Act, if available, rather than under this prospectus, provided that they meet the criteria and conform to the requirements of those provisions.

In addition, a Selling Stockholder that is an entity may elect to make an in-kind distribution of Resale Shares to its members, partners or stockholders pursuant to the registration statement of which this prospectus is a part by delivering a prospectus. Such members, partners or stockholders would thereby receive freely tradeable securities pursuant to the distribution through a registration statement. To the extent a distributee is an affiliate of ours (or to the extent otherwise required by law), we may file a prospectus supplement in order to permit the distributees to use the prospectus to resell the securities acquired in the distribution.

Broker-dealers engaged by the Selling Stockholders may arrange for other broker-dealers to participate in sales. If the Selling Stockholders effect such transactions by selling Resale Shares to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of

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discounts, concessions or commissions from the Selling Stockholders or commissions from purchasers of the Resale Shares for whom they may act as agent or to whom they may sell as principal. Such commissions will be in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction will not be in excess of a customary brokerage commission in compliance with FINRA Rule 2121; and in the case of a principal transaction a markup or markdown in compliance with FINRA IM-2121.01.

In connection with sales of the Resale Shares or otherwise, the Selling Stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the Resale Shares in the course of hedging in positions they assume. The Selling Stockholders may also sell Resale Shares short and if such short sale takes place after the date that this Registration Statement is declared effective by the SEC, the Selling Stockholders may deliver Resale Shares covered by this prospectus to close out short positions and to return borrowed Resale Shares in connection with such short sales. The Selling Stockholders may also loan or pledge Resale Shares to broker-dealers that in turn may sell such Resale Shares, to the extent permitted by applicable law. The Selling Stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction). Notwithstanding the foregoing, the Selling Stockholders have been advised that they may not use Resale Shares the resale of which has been registered on this registration statement to cover short sales of our Common Stock made prior to the date the registration statement, of which this prospectus forms a part, has been declared effective by the SEC.

The Selling Stockholders may, from time to time, pledge or grant a security interest in some or all of the Resale Shares owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the Resale Shares from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act, amending, if necessary, the list of Selling Stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The Selling Stockholders also may transfer and donate the Resale Shares in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

The Selling Stockholders and any broker-dealer or agents participating in the distribution of the Resale Shares may be deemed to be “underwriters” within the meaning of Section 2(11) of the Securities Act in connection with such sales. In such event, any commissions paid, or any discounts or concessions allowed to, any such broker-dealer or agent and any profit on the resale of the shares purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Selling Stockholders who are “underwriters” within the meaning of Section 2(11) of the Securities Act will be subject to the applicable prospectus delivery requirements of the Securities Act including Rule 172 thereunder and may be subject to certain statutory liabilities of, including but not limited to, Sections 11, 12 and 17 of the Securities Act and Rule 10b-5 under the Exchange Act.

Each Selling Stockholder has informed the Company that it is not a registered broker-dealer and does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the Resale Shares. Upon the Company being notified in writing by a selling stockholder that any material arrangement has been entered into with a broker-dealer for the sale of Common Stock through a block trade, special offering, exchange distribution or secondary distribution or a purchase by a broker or dealer, a supplement to this prospectus will be filed, if required, pursuant to Rule 424(b) under the Securities Act, disclosing (i) the name of each such selling stockholder and of the participating broker-dealer(s), (ii) the number of Resale Shares involved, (iii) the price at which such the Resale Shares were sold, (iv) the commissions paid or discounts or concessions allowed to such broker-dealer(s), where applicable, (v) that such broker-dealer(s) did not conduct any investigation to verify the information set out in this prospectus, and (vi) other facts material to the transaction. In no event shall any broker-dealer receive fees, commissions and markups, which, in the aggregate, would exceed eight percent (8.0%).

Under the securities laws of some U.S. states, the Resale Shares may be sold in such states only through registered or licensed brokers or dealers. In addition, in some U.S. states the Resale Shares may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

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There can be no assurance that any Selling Stockholder will sell any or all of the Resale Shares registered pursuant to the shelf registration statement of which this prospectus forms a part.

Each Selling Stockholder and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including, without limitation, to the extent applicable, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the Resale Shares by the Selling Stockholder and any other participating person. To the extent applicable, Regulation M may also restrict the ability of any person engaged in the distribution of the Resale Shares to engage in market-making activities with respect to the Resale Shares. All of the foregoing may affect the marketability of the Resale Shares and the ability of any person or entity to engage in market-making activities with respect to the Resale Shares.

We will pay all expenses of the registration of the Resale Shares pursuant to the registration rights agreement, including, without limitation, SEC filing fees and expenses of compliance with state securities or “blue sky” laws; provided, however, that each Selling Stockholder will pay all underwriting discounts and selling commissions, if any and any related legal expenses incurred by it. We will indemnify the Selling Stockholders against certain liabilities, including some liabilities under the Securities Act, in accordance with the 2023 RRA, or the Selling Stockholders will be entitled to contribution. We may be indemnified by the Selling Stockholders against certain civil liabilities set forth in the 2023 RRA, including liabilities under the Securities Act, that may arise from any written information furnished to us by the Selling Stockholders specifically for use in this prospectus, in accordance with the related 2023 RRA, or we may be entitled to contribution.

LEGAL MATTERS

Unless otherwise indicated in the applicable prospectus supplement, the validity of the securities will be passed upon for us by Covington & Burling LLP, New York, New York. If legal matters are passed upon by counsel for the underwriters, dealers or agents, if any, such counsel will be named in the prospectus supplement relating to such offering.

EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our consolidated financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2023 and the effectiveness of our internal control over financial reporting as of December 31, 2023, as set forth in their reports, which are incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on Ernst & Young LLP's reports, given on their authority as experts in accounting and auditing.

The financial statements of Cartesian Therapeutics, Inc. as of and for the years ended December 31, 2022 and 2021 appearing in the Current Report on Form 8-K/A filed on January 23, 2024 of Cartesian Therapeutics, Inc. (formerly known as Selecta Biosciences, Inc.) incorporated by reference in this Prospectus and in the Registration Statement have been so incorporated in reliance on the report of BDO USA, P.C., independent auditors, given on the authority of said firm as experts in auditing and accounting.

PART II
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The following is an estimate, other than with respect to the SEC registration fee, of the expenses (all of which are to be paid by the registrant) that we may incur in connection with the securities being registered hereby.

SEC registration fee	\$ 36,436
Printing expenses	\$ 4,000
Legal fees and expenses	\$ 50,000
Accounting fees and expenses	\$ 55,000
Miscellaneous	\$ 4,564
Total	<u>\$ 150,000</u>

Item 15. Indemnification of Directors and Officers

Subsection (a) of Section 145 of the General Corporation Law of the State of Delaware, or the DGCL, empowers a corporation to indemnify any person who was or is a party or who is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe the person's conduct was unlawful.

Subsection (b) of Section 145 empowers a corporation to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that the person acted in any of the capacities set forth above, against expenses (including attorneys' fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Section 145 further provides that to the extent a director or officer of a corporation has been successful on the merits or otherwise in the defense of any action, suit or proceeding referred to in subsections (a) and (b) of Section 145, or in defense of any claim, issue or matter therein, such person shall be indemnified against expenses (including attorneys' fees) actually and reasonably incurred by such person in connection therewith; that indemnification provided for by Section 145 shall not be deemed exclusive of any other rights to which the indemnified party may be entitled; and the indemnification provided for by Section 145 shall, unless otherwise provided when authorized or ratified, continue as to a person who has ceased to be a director, officer, employee or agent and shall inure to the benefit of such person's heirs, executors and administrators. Section 145 also empowers the corporation to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any such capacity, or arising out of his status as such, whether or not the corporation would have the power to indemnify such person against such liabilities under Section 145.

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Section 102(b)(7) of the DGCL provides that a corporation's certificate of incorporation may contain a provision eliminating or limiting the personal liability of a director to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, provided that such provision shall not eliminate or limit the liability of a director (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the DGCL, or (iv) for any transaction from which the director derived an improper personal benefit.

Any underwriting agreement or distribution agreement that the registrant enters into with any underwriters or agents involved in the offering or sale of any securities registered hereby may require such underwriters or dealers to indemnify the Company, some or all of its directors and officers and its controlling persons, if any, for specified liabilities, which may include liabilities under the Securities Act of 1933, as amended, or the Securities Act.

The Company's restated certificate of incorporation, as amended, or the Charter, provides that to the fullest extent permitted by the DGCL, none of the Company's directors shall be liable to the Company or its stockholders for monetary damages arising from a breach of fiduciary duty owed to the Company or its stockholders. In addition, the Company's amended and restated by-laws, or the Bylaws, provide that the Company must indemnify its directors and officers to the fullest extent authorized by the DGCL and must also pay expenses incurred in defending any such proceeding in advance of its final disposition upon delivery of an undertaking, by or on behalf of an indemnified person, to repay all amounts so advanced if it should be determined ultimately that such person is not entitled to be indemnified under this section or otherwise.

The Company has entered into indemnification agreements with each of our directors and executive officers in which we have agreed to indemnify, defend and hold harmless, and also advance expenses as incurred, to the fullest extent permitted under applicable law, from damage arising from the fact that such person is or was an officer or director of the Company or its subsidiaries.

The indemnification rights set forth above shall not be exclusive of any other right which an indemnified person may have or hereafter acquire under any statute, the Company's Charter, the Company's Bylaws, any agreement, any vote of stockholders or disinterested directors or otherwise.

The Company expects to maintain standard policies of insurance that provide coverage (1) to its directors and officers against loss rising from claims made by reason of breach of duty or other wrongful act and (2) to the Company with respect to indemnification payments that it may make to such directors and officers.

The Company has purchased and intends to maintain insurance on behalf of Cartesian Therapeutics, Inc. and any person who is or was a director or officer against any loss arising from any claim asserted against him or her and incurred by him or her in that capacity, subject to certain exclusions and limits of the amount of coverage.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or persons controlling the registrant pursuant to the foregoing provisions, the registrant has been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

Item 16. Exhibits

Exhibit Number	Description
2.1	Agreement and Plan of Merger, dated November 13, 2023, by and among Selecta Biosciences, Inc. Sakura Merger Sub I, Inc., Sakura Merger Sub II, LLC and Cartesian Therapeutics, Inc. (incorporated herein by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K (File No. 001-37798) filed on November 13, 2023).
3.1	Restated Certificate of Incorporation of Selecta Biosciences, Inc. (incorporated herein by reference to Exhibit 3.1 of the Registrant's Current Report on Form 8-K (File No. 001-37798) filed on June 29, 2016).
3.2	Certificate of Amendment to the Restated Certificate of Incorporation of Selecta Biosciences, Inc., dated June 21, 2022 (incorporated herein by reference to Exhibit 3.1 of the Registrant's Current Report on Form 8-K (File No. 001-37798) filed on June 21, 2022).

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Exhibit Number	Description
3.3	Certificate of Amendment to the Restated Certificate of Incorporation of Selecta Biosciences, Inc., dated November 13, 2023 (incorporated herein by reference to Exhibit 3.3 of the Registrant's Current Report on Form 8-K (File No. 001-37798) filed on November 13, 2023).
3.4	Certificate of Amendment to the Restated Certificate of Incorporation, as amended, of Cartesian Therapeutics, Inc., dated March 28, 2024 (incorporated herein by reference to Exhibit 3.2 of the Registrant's Current Report on Form 8-K (File No. 001-37798) filed on March 28, 2024).
3.5	Amended and Restated By-laws of Cartesian Therapeutics, Inc. (incorporated herein by reference to Exhibit 3.2 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-37798) filed on November 13, 2023).
3.6	Certificate of Designation of Preferences, Rights and Limitations of Series A Non-Voting Convertible Preferred Stock (incorporated herein by reference to Exhibit 3.4 of the Registrant's Current Report on Form 8-K (File No. 001-37798) filed on November 13, 2023).
3.7	Certificate of Amendment to the Certificate of Designation of Series A Non-Voting Convertible Preferred Stock, dated March 26, 2024 (incorporated herein by reference to Exhibit 3.1 of the Registrant's Current Report on Form 8-K (File No. 001-37798) filed on March 28, 2024).
3.8	Certificate of Designation of Preferences, Rights and Limitations of Series B Non-Voting Convertible Preferred Stock (incorporated herein by reference to Exhibit 3.1 of the Registrant's Current Report on Form 8-K (File No. 001-37798) filed on July 2, 2024).
4.1	Form of Specimen Certificate Representing Common Stock (incorporated herein by reference to Exhibit 4.2 of the Registrant's Registration Statement on Form S-1 (File No. 333-211555) filed on May 24, 2016).
4.2	Form of Registration Rights Agreement, dated as of November 13, 2023, by and among the Registrant and the certain purchasers party thereto (incorporated herein by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K (File No. 001-37798) filed on November 13, 2023).
5.1	Opinion of Covington & Burling LLP.
23.1	Consent of Covington & Burling LLP (included in Exhibit 5.1).
23.2	Consent of Ernst & Young LLP, independent registered public accounting firm.
23.3	Consent of BDO USA, P.C., independent registered public accounting firm.
24.1	Powers of Attorney (incorporated by reference to the signature page hereto).
107	Filing Fee Table.

Item 17. Undertakings

- (a) The undersigned registrant hereby undertakes:
- (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:
 - (i) To include any prospectus required by Section 10(a)(3) of the Securities Act;
 - (ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Filing Fee Tables" or "Calculation of Registration Fee" table, as applicable, in the effective registration statement; and
 - (iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

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provided, however, that paragraphs (a)(1)(i), (a)(1)(ii), and (a)(1)(iii) above do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to section 13 or section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is a part of the registration statement.

- (2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.
 - (3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.
 - (5) That, for the purpose of determining liability under the Securities Act to any purchaser:
 - (A) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and
 - (B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by section 10(a) of the Securities Act shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.
 - (b) That, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.
 - (h) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.
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<u>SIGNATURE</u>	<u>TITLE</u>	<u>DATE</u>
<u>/S/ KEMAL MALIK, MBBS</u> Kemal Malik, MBBS	Director	December 13, 2024
<u>/S/ MICHAEL SINGER, M.D., PH.D.</u> Michael Singer, M.D., Ph.D.	Director	December 13, 2024
<u>/S/ TIMOTHY SPRINGER, PH.D.</u> Timothy Springer, Ph.D.	Director	December 13, 2024
<u>/S/ PATRICK ZENNER</u> Patrick Zenner	Director	December 13, 2024

COVINGTON

BEIJING BOSTON BRUSSELS DUBAI FRANKFURT
JOHANNESBURG LONDON LOS ANGELES NEW YORK
PALO ALTO SAN FRANCISCO SEOUL SHANGHAI WASHINGTON

Covington & Burling LLP
The New York Times Building
620 Eighth Avenue
New York, NY 10018-1405
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December 13, 2024

Cartesian Therapeutics, Inc.
7495 New Horizon Way
Frederick, Maryland 21703

Ladies & Gentlemen:

We have acted as counsel to Cartesian Therapeutics, Inc., a Delaware corporation (the “*Company*”), in connection with the registration by the Company under the Securities Act of 1933, as amended (the “*Act*”), of the resale of up to (i) 9,512,275 shares (the “*Issued Shares*”) of the Company’s common stock, par value \$0.0001 per share (“*Common Stock*”) and (ii) 1,880,075 shares (the “*Underlying Shares*”) of the Company’s Common Stock issuable upon the conversion of 56,402.254 shares (the “*Preferred Shares*”) of the Company’s Series A Non-Voting Convertible Preferred Stock, par value \$0.0001 per share, pursuant to the registration statement on Form S-3 filed with the Securities and Exchange Commission (the “*Commission*”) on the date hereof (such registration statement, as amended to the date hereof, is herein referred to as the “*Registration Statement*”).

We have reviewed such corporate records, certificates and other documents, and such questions of law, as we have considered necessary or appropriate for the purposes of this opinion. We have assumed that all signatures are genuine, that all documents submitted to us as originals are authentic and that all copies of documents submitted to us conform to the originals.

Based upon the foregoing, we are of the opinion that the Issued Shares have been duly authorized and validly issued and are fully paid and non-assessable, and the Underlying Shares initially issuable upon conversion of the Preferred Shares have been duly authorized and reserved for issuance, and, when the Preferred Shares have been duly converted into the Underlying Shares in accordance with the terms of the Preferred Shares, the Underlying Shares will be validly issued, fully paid and non-assessable.

We are members of the bar of the State of New York. We do not express any opinion herein on any laws other than the Delaware General Corporation Law.

We hereby consent to the filing of this opinion as Exhibit 5.1 to the Registration Statement. We also hereby consent to the reference to our firm under the heading "Legal Matters" in the prospectus constituting part of the Registration Statement. In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act.

Very truly yours,

/s/ Covington & Burling LLP

Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption “Experts” in the Registration Statement (Form S-3) and related Prospectus of Cartesian Therapeutics, Inc. for the registration of 11,392,350 shares of its common stock and to the incorporation by reference therein of our reports dated March 7, 2024, with respect to the consolidated financial statements of Cartesian Therapeutics, Inc. and the effectiveness of internal control over financial reporting of Cartesian Therapeutics, Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2023, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP
Boston, Massachusetts

December 13, 2024

Consent of Independent Auditor

We hereby consent to the incorporation by reference in the Prospectus constituting a part of this Registration Statement of Cartesian Therapeutics, Inc. (formerly known as Selecta Biosciences, Inc.) of our report dated January 23, 2024, relating to the financial statements of Cartesian Therapeutics, Inc., appearing in Cartesian Therapeutics, Inc.'s (formerly known as Selecta Biosciences, Inc.) Current Report on Form 8-K/A filed January 23, 2024.

We also consent to the reference to us under the caption "Experts" in the Prospectus.

/s/ BDO USA, P.C.
Potomac, Maryland

December 13, 2024

Calculation of Filing Fee Tables

Form S-3
(Form Type)

Cartesian Therapeutics, Inc.

(Exact Name of Registrant as Specified in its Charter)

Table 1: Newly Registered Securities

	Security Type	Security Class Title	Fee Calculation Rule	Amount Registered	Proposed Maximum Offering Price Per Share	Maximum Aggregate Offering Price	Fee Rate	Amount of Registration Fee
Fees to Be Paid	Equity	Common stock, par value \$0.0001 per share(1)	Rule 457(c)	11,392,350(2)	\$ 20.89(3)	\$ 237,986,191.50(3)	0.0001531	\$ 36,435.69
Fees Previously Paid	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Offering Amounts						\$ 237,986,191.50		\$ 36,435.69
Total Fees Previously Paid								—
Total Fee Offsets								—
Net Fee Due								\$ 36,435.69

(1) Pursuant to Rule 416 under the Securities Act of 1933, as amended (the “Securities Act”), this registration statement also covers such an indeterminate amount of shares of common stock, par value \$0.0001 per share (“Common Stock”), as may become issuable to prevent dilution resulting from stock splits, stock dividends and similar events.

(2) The amount registered consists of up to (i) 9,512,275 shares of Common Stock, (ii) 1,880,075 shares of Common Stock issuable upon the conversion of 56,402.254 shares of Series A Non-Voting Convertible Preferred Stock, par value \$0.0001 per share (“Series A Preferred Stock”).

(3) Estimated solely for the purpose of calculating the registration fee, based on the average of the high and low prices of the shares of Common Stock on the Nasdaq Global Market on December 12, 2024 (such date being within five business days of the date that this registration statement was first filed with the Securities and Exchange Commission, in accordance with Rule 457(c) under the Securities Act).