

PROSPECTUS

RENOVO | RX

Secondary Offering of 1,947,040 Shares of Common Stock Issuable Upon Exercise of Warrants

This prospectus relates to the resale by the selling stockholder named herein, including its transferees, pledgees or donees, or their respective successors, of up to 1,947,040 shares (the “Shares”) of our common stock, par value \$0.0001 per share, issuable upon the exercise of warrants (the “Warrants”). Armistice Capital Master Fund Ltd. is the “Selling Stockholder”. For information about the Selling Stockholder, see “Selling Stockholder” on page 11.

Our common stock offered by the Selling Stockholder will be issued pursuant to the exercise of Warrants in accordance with their terms. The Warrants were issued in connection with that certain Securities Purchase Agreement entered into by us with the Selling Stockholder. See “Private Placement of Warrants.”

We are not selling any securities under this prospectus and will not receive any of the proceeds from the sale of common stock by the Selling Stockholder, except for funds received from the exercise of Warrants held by the Selling Stockholder, if and when exercised for cash.

The Selling Stockholder may sell shares of common stock (the “Securities”) from time to time in the principal markets on which the common stock is quoted at the prevailing market price, at prices related to prevailing market prices or in negotiated transactions.

The Selling Stockholder may sell shares to or through underwriters, broker-dealers or agents, who may receive compensation in the form of discounts, concessions or commissions from the Selling Stockholder, the purchasers of the shares, or both.

We are registering the offer and sale of the Securities pursuant to certain registration rights granted to the Selling Stockholder. The timing and amount of any sale of common stock is within the sole discretion of the Selling Stockholder. We do not know when or in what amount the Selling Stockholder may offer the Securities for sale. We will pay the expenses of registering these Securities, including legal and accounting fees. All selling and other expenses incurred by the Selling Stockholder will be borne by the Selling Stockholder. See “Plan of Distribution.”

Our common stock is listed on The Nasdaq Capital Market under the symbol “RNXT.” On May 17, 2023, the last reported sale price of our common stock on The Nasdaq Capital Market was \$2.10 per share.

The purchase of the common stock offered through this prospectus involves a high degree of risk. You should carefully consider the risk factors beginning on page 7 of this prospectus before purchasing any of the securities offered by this prospectus.

We may amend or supplement this prospectus from time to time by filing amendments or supplements as required. You should read the entire prospectus and any amendments or supplements carefully before you make your investment decision.

Neither the Securities and Exchange Commission (“SEC”) 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 May 19, 2023.

Table of Contents

	<u>Page</u>
About This Prospectus	1
Forward-Looking Statements	2
Prospectus Summary	4
The Offering	6
Risk Factors	7
Use of Proceeds	9
Private Placement of Warrants	10
Selling Stockholder	11
Plan of Distribution	12
Legal Matters	14
Experts	14
Where You Can Find More Information	14
Incorporation of Certain Information by Reference	15

ABOUT THIS PROSPECTUS

The information contained in this prospectus is not complete and may be changed. You should rely only on the information provided in or incorporated by reference in this prospectus, in any prospectus supplement or in a related free writing prospectus, or documents to which we otherwise refer you. We have not authorized anyone else to provide you with different information.

We have not authorized any dealer, agent or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus and any accompanying prospectus supplement or any related free writing prospectus. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus or an accompanying prospectus supplement or any related free writing prospectus. This prospectus and any accompanying prospectus supplement and any related free writing prospectus, if any, do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate, nor do this prospectus and any accompanying prospectus supplement and any related free writing prospectus, if any, constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. You should not assume that the information contained in this prospectus and any accompanying prospectus supplement and any related free writing prospectus, if any, is accurate on any date subsequent to the date set forth on the front of such document or that any information we have incorporated by reference is correct on any date subsequent to the date

of the document incorporated by reference, even though this prospectus and any accompanying prospectus supplement and any related free writing prospectus is delivered or securities are sold on a later date.

We have not done anything that would permit this offering or possession or distribution of this prospectus or any free writing prospectus in any jurisdiction where action for that purpose is required, other than in the United States. You are required to inform yourself about and to observe any restrictions relating as to this offering and the distribution of this prospectus and any such free writing prospectus outside the United States.

We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to any document that is incorporated by reference in this prospectus were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

We own or have rights to use a number of registered and common law trademarks, service marks and/or trade names in connection with our business in the United States and/or in certain foreign jurisdictions. Solely for convenience, the trademarks, service marks, logos and trade names referred to in this prospectus are without the ® and ™ symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the rights of the applicable licensors to these trademarks, service marks and trade names. This prospectus contains additional trademarks, service marks and trade names of others, which are the property of their respective owners. All trademarks, service marks and trade names appearing in this prospectus are, to our knowledge, the property of their respective owners. We do not intend our use or display of other companies' trademarks, service marks, copyrights or trade names to imply a relationship with, or endorsement or sponsorship of us by, any other companies. We have trademarks for the names RENOVORX, RENOVOGEM, RENOVOCATH, TAMP and DELIVERING THERAPY WHERE IT MATTERS. We have a trademark pending for RenovoTAMP. In this prospectus, except as otherwise indicated, "RenovoRx," the "Company," "we," "our," and "us" refer to RenovoRx, Inc., a Delaware corporation, and its subsidiaries.

1

FORWARD-LOOKING STATEMENTS

This prospectus, any accompanying prospectus supplement and the information incorporated by reference herein contain forward-looking statements. All statements other than statements of historical facts contained in this prospectus and the information incorporated by reference herein, including statements regarding our future results of operations and financial position, business strategy, product candidates, planned preclinical studies and clinical trials, results of clinical trials, research and development costs, regulatory approvals, timing and likelihood of success, as well as plans and objectives of management for future operations, are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that are in some cases beyond our control and may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "would," "expect," "plan," "anticipate," "could," "intend," "target," "project," "believe," "estimate," "predict," "potential," or "continue" or the negative of these terms or other similar expressions. Forward-looking statements contained in this prospectus and the documents incorporated by reference herein include, but are not limited to, statements about:

- the sufficiency of our existing cash, cash equivalents, and investments to fund our future operating expenses and capital expenditure requirements;
- our estimates regarding expenses, future revenue, anticipated capital requirements to fund our future operating expenses, and our need for additional financing;
- our financial performance;
- our anticipated use of our existing cash, cash equivalents, and investments;
- the ability of our clinical trials to demonstrate safety and efficacy of our product candidates, and other positive results;
- the progress and focus of our current and future clinical trials, and the timing of reporting of data from those trials;
- our continued reliance on third parties to conduct clinical trials of our product candidates, and for the manufacture of our product candidates;
- the beneficial characteristics, safety, efficacy, and therapeutic effects of our product candidates;
- our ability to advance product candidates into and successfully complete clinical trials;
- our ability to further develop and expand our therapy platform, both to use different chemotherapeutic agents and to include new indications;
- expectations relating to the timing of the provision of updates on, data readouts for, and completion of our clinical trials;
- our ability to obtain and maintain regulatory approval of our product candidates and the timing or likelihood of regulatory filings and approvals, including our expectation to seek special designations, such as orphan drug designation, for our product candidates for various diseases;

2

- existing regulations and regulatory developments in the United States and other jurisdictions;
- our plans relating to commercializing our product candidates, if approved, including the geographic areas of focus and our potential and ability to successfully commercialize our product candidates and generate revenue;
- the implementation of our strategic plans for our business and product candidates;
- the expected potential benefits of strategic collaborations with third parties and our ability to attract collaborators with relevant and complementary expertise;
- our estimates of the number of patients in the United States who suffer from the diseases we target, and enrollment timing and projections for our clinical trials;
- our estimates of potential market opportunities and our ability to successfully realize these opportunities;
- the success of competing therapies that are or may become available;
- developments relating to our competitors and our industry, including competing product candidates and therapies;

- our plans relating to the further development and manufacturing of our product candidates, including for additional indications which we may pursue;
- our plans and ability to obtain or protect intellectual property rights, including extensions of existing patent terms where available;
- the scope of protection we are able to establish and maintain for intellectual property rights, including our therapy platform and product candidates;
- our ability to successfully negotiate and enter into agreements with distribution, strategic and corporate partners;
- our potential and ability to successfully manufacture and supply our product candidates for clinical trials and for commercial use, if approved;
- our ability to retain the continued service of our key personnel and to identify, hire, and then retain additional qualified personnel; and
- our expectations regarding the impact of the ongoing COVID-19 pandemic and geopolitical events on our business.

We have based these forward-looking statements largely on our current expectations and projections about our business, the industry in which we operate and financial trends that we believe may affect our business, financial condition, results of operations and prospects, and these forward-looking statements are not guarantees of future performance or development. These forward-looking statements speak only as of the date of this prospectus and are subject to a number of risks, uncertainties and assumptions described in the section titled “Risk Factors” and elsewhere in this prospectus, each accompanying prospectus supplement, and the information incorporated by reference herein and therein. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein until after we distribute this prospectus, whether as a result of any new information, future events or otherwise.

In addition, statements that “we believe” and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this prospectus, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain, and you are cautioned not to unduly rely upon these statements.

PROSPECTUS SUMMARY

The following summary highlights information contained elsewhere in this prospectus. It does not contain all of the information you need to consider in making your investment decision. Before making an investment decision, you should read this entire prospectus carefully and you should consider, among other things, the matters set forth under “Risk Factors” and our financial statements and related notes thereto appearing elsewhere in this prospectus. In this prospectus, except as otherwise indicated, “RenovoRx,” the “Company,” “we,” “our,” and “us” refer to RenovoRx, Inc., a Delaware corporation, and its subsidiaries.

Company Overview

We are a clinical-stage biopharmaceutical company with a vision to disrupt the current paradigm of cancer treatment. Our mission is to lead a revolution in oncology therapy by delivering its innovative and targeted intra-arterial (IA) delivery of chemotherapy directly to solid tumors. The proprietary RenovoRx Trans-Arterial Micro-Perfusion (RenovoTAMP®) therapy platform aims to avoid the harsh side effects typical of the current standard of care, or systemic delivery methods, thus improving patient well-being and, potentially extension of life, so more time may be enjoyed with loved ones. RenovoTAMP utilizes approved chemotherapeutics with validated mechanisms of action and well-established safety and clinical use, with the goal of improving their safety, tolerance, and widening their therapeutic window by providing more targeted delivery at the location of the tumor tissue. RenovoRx’s lead product candidate, RenovoGem™, is a combination of gemcitabine and its patented delivery system, RenovoCath®. The FDA has determined that RenovoGem will be regulated as, and if approved we expect will be reimbursed as, a new oncology drug product. We have secured FDA Orphan Drug Designation for RenovoGem in two rare diseases: pancreatic cancer and cholangiocarcinoma (bile duct cancer, or eCCA). We have completed our RR1 Phase 1/2 and RR2 observational registry studies, with 20 and 25 patients respectively, in locally advanced pancreatic cancer, or LAPC. These studies demonstrated a median overall survival of 27.9 months in patients pre-treated with radiation followed by treatment with RenovoGem. Based on previous large randomized clinical trials, the expected survival of LAPC patients is 12 - 15 months in patients receiving only intravenous (IV) systemic chemotherapy or IV chemotherapy plus radiation (which are both considered standard of care). Unlike the randomized trials that established these standard-of-care results, our RR1 and RR2 clinical trials did not prospectively control the standard of care therapy received prior to administration of RenovoGem. Based on an FDA safety review of our Phase 1/2 study, FDA allowed us to proceed to evaluate RenovoGem within our Phase 3 registrational clinical trial.

In December 2021 we amended the protocol for this clinical trial to only allow for stereotactic body radiation therapy (SBRT) during the induction phase of the study (prior to randomization). We had previously permitted both SBRT and intensity-modulated radiation therapy (IMRT). Patients receiving IMRT must complete 25 radiation treatments in combination with oral chemotherapy during the induction phase of the study, which takes between 35 and 56 days to complete. In comparison, patients receiving SBRT during the induction phase are only required to complete 5 treatments, over 5 consecutive days, and do not receive oral chemotherapy. The decision to modify the study population was based on the observation in the Phase 3 TIGeR-PaC study that IMRT patients had a higher dropout rate during the induction phase of the study due to the high frequency of hospital visits and side effects from the required concurrent chemotherapy. As part of the pre-randomization, induction phase change made to the protocol, we initiated a review of the statistical considerations for the study and in June 2022, submitted a modified Statistical Analysis Plan (the “Modified SAP”) to FDA. As part of the Modified SAP, we now plan to (i) analyze only patients receiving SBRT, consistent with the protocol change made in December 2021, (ii) include a second interim analysis, (iii) change the total number of SBRT patients randomized in the study to 114 (a reduction from the original 200 patients) with a total of 86 deaths from SBRT patients, including all deaths from SBRT patients enrolled in the study before the submission of the Modified SAP, and (iv) repower the study from 90% to 80%, which is commonly used in clinical trials. We believe these changes will shorten the timeframe needed to complete the study and also significantly decrease our costs. We have not discussed the protocol amendment or the Modified SAP with the FDA, and we cannot provide any assurance that the FDA will agree with these modifications. The first planned interim analysis was triggered when 30%, or 26 of 86, of the total number of deaths have occurred, and the second interim analysis at 60%, or 52 of 86, of the total number of deaths have occurred and is estimated to be mid-2024. Given that the timing of the interim analysis is predicated on a specific number of deaths, it is difficult to predict the exact timing of the interim analysis or when we will be able to complete the study. As of March 20, 2023, the Phase III TIGeR-PaC trial has randomized 48 SBRT patients out of 114 total needed under the Modified SAP. At this rate, we anticipate that all patients will be enrolled and randomized in 2024, with the final study readout in 2025.

Our RenovoTAMP therapy platform is focused on optimizing drug concentration in solid tumors using approved small molecule chemotherapeutics. Our platform enables physicians to isolate segments of the vascular anatomy closest to tumors and force chemotherapy across the blood vessel wall to bathe these difficult-to-reach solid tumors in chemotherapy. Specifically, our patented approach allows physicians to combine, on the one hand, pre-treatment of the local blood vessels and tissue with standard-of-care radiation therapy to decrease chemotherapy washout and, on the other hand, local delivery via our patented RenovoCath delivery system which utilizes pressure to force small molecule chemotherapy into the tumor tissue. We believe there are many advantages to our RenovoTAMP therapy platform, including:

- Application of Approved Small Molecule Chemotherapeutic Agents: We use approved small molecule chemotherapeutic agents, such as gemcitabine, with well-known safety and efficacy profiles.

- **Targeted Approach:** In a preclinical study using our therapy platform, we demonstrated up to 100 times higher local drug concentration compared to systemic chemotherapy. We believe our RenovoTAMP therapy platform allows for a targeted approach that can decrease systemic exposure and improve patient outcomes.
- **Delivery Method Independent of Tumor Vascularity:** Our therapy platform is designed to deliver small molecule chemotherapeutic agents to solid tumors resistant to systemic chemotherapy due to lack of tumor feeder blood vessels. If approved, our product candidates have the potential to treat tumors that are not directly supported by blood vessels.
- **Broad Application for Solid Tumor Indications:** Our therapy platform is not restricted to a single small molecule chemotherapeutic agent or solid tumor type. As such, it may be applied for use in additional solid tumor indications, including in solid tumors without identifiable tumor feeder blood vessels.

Corporate Information

We were incorporated in the State of Delaware on December 17, 2012. Our principal executive offices are located at 4546 El Camino Real, Suite B1, Los Altos, CA 94022. Our telephone number is (650) 284-4433. Our website address is <https://renovorx.com>. Information contained in our website does not constitute any part of, and is not incorporated into, this prospectus.

5

THE OFFERING

Common Stock to be offered:	1,947,040 shares of our common stock issuable upon exercise of Warrants held by the Selling Stockholder.
Terms of the Offering:	The Selling Stockholder will determine when and how to sell the Shares offered in this prospectus, as described in “Plan of Distribution.”
Use of Proceeds:	We will not receive any proceeds from the sale of Shares in this offering. However, we will receive proceeds from the exercise of the Warrants by the Selling Stockholder to the extent they are exercised for cash. In the event we receive proceeds from the cash exercise of the Warrants, we intend to use the aggregate net proceeds from the exercise of the Warrants for general corporate purposes, including working capital. See the sections titled “Use of Proceeds” and “Selling Stockholder” for additional information.
Listing and Symbols:	Our common stock is listed on The Nasdaq Capital Market under the symbol “RNXT”.
Risk Factors:	Investing in our securities involves substantial risks. You should read the “Risk Factors” section of this prospectus and in the documents incorporated by reference in this prospectus for a discussion of factors to consider before deciding to purchase our securities.

Shares of our common stock that may be offered under this prospectus will be fully paid and non-assessable. Throughout this prospectus, when we refer to the shares of our common stock being registered on behalf of the selling stockholder for offer and resale, we are referring to the shares of common stock that have been issued to the selling stockholder and the shares of common stock issuable upon exercise of Warrants issued in the Private Placement described in the section titled “Private Placement.” When we refer to the Selling Stockholder in this prospectus, we are referring to the Selling Stockholder identified in this prospectus and, as applicable, its permitted transferees or other successors-in-interest that may be identified in a supplement to this prospectus or, if required, a post-effective amendment to the registration statement of which this prospectus is a part.

6

RISK FACTORS

Investing in our securities involves a high degree of risk. Before making a decision to invest in our securities, in addition to carefully considering the Risk Factors noted below and the other information contained in this prospectus and incorporated by reference herein, you should carefully consider the risks described under the caption “Risk Factors” contained in our most recent annual report on Form 10-K and in our most recent quarterly report on Form 10-Q, as well as any amendments thereto, which are incorporated by reference into this prospectus in their entirety. See “Where You Can Find More Information” and “Incorporation of Certain Information by Reference.”

Risks Relating to this Offering:

If you purchase the common stock being offered in this offering, you may experience immediate dilution as a result of this offering.

Since the price per share of our common stock being offered may be substantially higher than the net tangible book value per share of our common stock, you may suffer immediate and substantial dilution in the net tangible book value of the common stock you purchase in this offering.

You may experience future dilution as a result of future equity offerings.

In order to raise additional capital, we may in the future offer additional shares of our common stock or other securities convertible into or exchangeable for our common stock that could result in further dilution to the investor purchasing our common stock in this offering or result in downward pressure on the price of our common stock. We may sell shares of our common stock or other securities in any other offering at prices that are higher or lower than the prices paid by the investor in this offering, and the investor purchasing shares or other securities in the future could have rights superior to existing stockholders. Moreover, to the extent that we issue options or warrants to purchase, or securities convertible into or exchangeable for, shares of our common stock in the future and those options, warrants or other securities are exercised, converted or exchanged, stockholders may experience further dilution.

The trading price of our common stock has been, and is likely to continue to be highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control.

Our stock price is volatile. During the period from May 11, 2022 to May 10, 2023, the closing price of our common stock ranged from a high of \$5.25 per share to a low of \$1.52 per share. The stock market in general and the market for smaller pharmaceutical and biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, you may not be able to sell your common stock at or above the public offering price and you may lose some or all of your investment.

7

Risks Relating to Our Business:

We will need to raise substantial additional capital to develop and commercialize RenovoGem, and our failure to obtain funding when needed may force us to delay, reduce or eliminate our product development programs or collaboration efforts. If we do not obtain adequate and timely funding, we may not be able to continue as a going concern.

We had cash, cash equivalents and short-term marketable securities of \$3.7 million as of March 31, 2023 and \$6.4 million as of December 31, 2022. Due to our recurring operating losses and the expectation that we will continue to incur net losses in the future, we will be required to raise additional capital to complete the development and commercialization of our product candidates. We have historically financed our operations primarily through private sales of our equity, debt financing and the sale of common stock and warrants in our initial public offering, or IPO. To raise additional capital, we may seek to sell additional equity and/or debt securities, obtain a credit facility or other loan or enter into collaborations, licenses or other similar arrangements, which we may not be able to do on favorable terms, or at all. For example, we have filed an omnibus shelf registration statement on Form S-3 that provides for aggregate offerings of up to \$50.0 million of the Company's securities subject to various limitations, including limited sales in any twelve-month period while we are subject to the "baby-shelf" rules. On April 3, 2023, the Company completed a registered direct offering under its shelf registration statement on Form S-3 for the purchase and sale of 1,557,632 shares of the Company's common stock (or pre-funded common stock warrants) at a purchase price of \$3.21 per share of common stock (or pre-funded common stock warrants) to a certain institutional investor (the "Registered Direct Offering"). Additionally, in a concurrent private placement, the Company issued to the investor unregistered warrants to purchase up to 1,947,040 shares of its common stock (together with the Registered Direct Offering, the "March 2023 Offering"). The aggregate gross proceeds from the March 2023 Offering were approximately \$5 million before deducting placement fees and other offering expenses. We also have filed a registration statement on Form S-1 to register the cash exercise of our outstanding warrants, with such cash exercise only expected to occur when the trading price of our common stock is in excess of the \$10.80 per share exercise price of our outstanding warrants. Our ability to obtain additional financing will be subject to a number of factors, including market conditions, fluctuations in interest rates, our operating performance and investor sentiment. If we are unable to raise additional capital when required or on acceptable terms, we may have to significantly delay, scale back or discontinue the development and/or commercialization of our product candidates, restrict or cease our operations or obtain funds by entering into agreements on unfavorable terms. Failure to obtain additional capital on acceptable terms, or at all, would result in a material and adverse impact on our operations. As a result, there is substantial doubt about our ability to operate as a going concern.

Our financial statements as of March 31, 2023 have been prepared on a going concern basis and do not include any adjustments that may result from the outcome of this uncertainty. If we fail to raise additional working capital, or do so on commercially unfavorable terms, it would materially and adversely affect our business, prospects, financial condition and results of operations, and we may be unable to continue as a going concern. As a result, there is substantial doubt about our ability to operate as a going concern. If we seek additional financing to fund our business activities in the future and there remains substantial doubt about our ability to continue as a going concern, investors or other financing sources may be unwilling to provide additional funding to us on commercially reasonable terms, if at all. If we are unable to continue as a going concern, we might have to liquidate our assets and the value we receive for our assets in liquidation or dissolution could be significantly lower than the values reflected in our financial statements, and our shareholders may lose their entire investment in our common stock.

8

USE OF PROCEEDS

We will not receive any proceeds from the sale of the shares of common stock by the Selling Stockholder. However, we will receive proceeds from the exercise of the Warrants by the Selling Stockholder to the extent they are exercised for cash. We estimate that the maximum proceeds that we may receive from the exercise of the Warrants, assuming all the Warrants are exercised at their average exercise price of \$3.21, will be \$6,249,998. We do not know, however, whether any of the Warrants will be exercised or, if any of the Warrants are exercised, when they will be exercised. It is possible that the Warrants will expire and never be exercised. There are circumstances under which the Warrants may be exercised on a cashless basis. In these circumstances, even if the Warrants are exercised, we may not receive any proceeds, or the proceeds that we do receive may be significantly less than what we might expect.

We will retain broad discretion over the use of the net proceeds to us from the exercise of the Warrants. Unless otherwise provided in the applicable prospectus supplement, we currently expect to use the aggregate net proceeds from the exercise of the Warrants for general corporate purposes, including working capital. We may also use a portion of the net proceeds to acquire, license or invest in complementary products, technologies or businesses; however, we currently have no agreements or commitments to complete any such transaction. The expected use of net proceeds from the exercise of the Warrants represents our current intentions based on our present plans and business conditions. We cannot specify with certainty all of the particular uses for the net proceeds to be received from the exercise of the Warrants. Pending these uses, we plan to invest the net proceeds of this offering in short- and intermediate-term, interest-bearing obligations, investment-grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government. The actual allocation of proceeds realized from the exercise of the Warrants will depend upon the amount and timing of such exercises, our operating revenues and cash position at such time and our working capital requirements.

The Selling Stockholder will pay any expenses incurred by the Selling Stockholder for brokerage, accounting, tax or legal services or any other expenses incurred by the Selling Stockholder in disposing of its shares of common stock. We will bear all other costs, fees and expenses incurred in effecting the registration of the shares covered by this prospectus, including, without limitation, all registration fees and fees and expenses of our counsel and our accountants.

9

PRIVATE PLACEMENT OF WARRANTS

On March 30, 2023, we entered into a securities purchase agreement ("Securities Purchase Agreement") with the Selling Stockholder. Pursuant to the Securities Purchase Agreement, we agreed to sell in a registered direct offering ("Registered Direct Offering") 1,000,000 Shares of our common stock, and purchase contracts issued as pre-funded warrants ("Pre-Funded Warrants") to purchase up to 557,632 shares of common stock to the extent that the Selling Stockholder determines, in its sole discretion, that the Selling Stockholder would beneficially own in excess of 4.99% (or at the Selling Stockholder's election, 9.99%). The Pre-Funded Warrants have an exercise price of \$0.0001 per share and are immediately exercisable and can be exercised at any time after their original issuance until such Pre-Funded Warrants are exercised in full. Each Share was sold at an offering price of \$3.21 and each Pre-Funded Warrant was sold at an offering price of \$3.2099 (equal to the purchase price per Share minus the exercise price of the Pre-Funded Warrant). Pursuant to the Securities Purchase Agreement, in a concurrent private placement, the Company also agreed to issue to the Selling Stockholder unregistered Warrants to purchase up to 1,947,040 shares of Common Stock. Each Common Warrant has an exercise price of \$3.21 per share, is exercisable at any time after their original issuance and will expire five and a half years from the original issuance date. The Warrants will not be registered nor listed on any exchange. However, pursuant to the Securities Purchase Agreement, the Company agreed to file a registration statement providing for the resale by the Selling Stockholder of the Shares issuable upon exercise of the Warrants.

10

SELLING STOCKHOLDER

We have prepared this prospectus to allow the Selling Stockholder we have identified herein, including its transferees, pledgees, donees and successors in interest, to offer for resale up to 1,947,040 shares of our common stock (assuming exercise of all Warrants).

The common stock being offered by the Selling Stockholder is that issuable to the Selling Stockholder upon exercise of the Warrants. For additional information regarding the issuances of those shares of common stock and Warrants, see "Private Placement of Warrants" above. We are registering the shares of common stock in order to permit the Selling Stockholder to offer the common stock for resale from time to time.

The registration of the sale of shares of common stock held by the Selling Stockholder does not mean that they will sell or otherwise dispose of all or any of those shares of common stock. The Selling Stockholder may sell or otherwise dispose of all, a portion or none of such shares from time to time. See "Plan of Distribution." We do not

know the number of shares, if any, that will be offered for sale or other disposition by the Selling Stockholder under this prospectus. Furthermore, the Selling Stockholder may have sold, transferred or disposed of the shares of common stock covered hereby in transactions exempt from the registration requirements of the Securities Act since the date on which we filed this prospectus. As a result, we cannot estimate the number of shares of common stock the Selling Stockholder will beneficially own after termination of sales under this prospectus. In addition, the Selling Stockholder may have sold, transferred or otherwise disposed of all or a portion of its shares of common stock since the date on which it provided information for the table below.

In accordance with the terms of the Securities Purchase Agreement with the Selling Stockholder, this prospectus generally covers the resale of the maximum number of shares of common stock issuable upon exercise of the Warrants issued pursuant to such Securities Purchase Agreement, determined as if the outstanding Warrants were exercised in full as of the trading day immediately preceding the date this registration statement was initially filed with the SEC, without regard to any limitations on the exercise of the Warrants.

Except as otherwise described in this prospectus, the Selling Stockholder has not, or within the past three years has not had, any position, office or other material relationship with us or any of our affiliates. The Selling Stockholder is not a broker-dealer or an affiliate of a broker-dealer.

The table below sets forth certain information with respect to the Selling Stockholder, including (i) the name of the Selling Stockholder; (ii) the number of shares of our common stock beneficially owned by the Selling Stockholder before this offering; (iii) the maximum number of shares being offered by the Selling Stockholder pursuant to this prospectus; and (iv) the Selling Stockholder's beneficial ownership after completion of this offering, assuming that all of the shares covered hereby (but no other shares, if any, held by the Selling Stockholder) are sold.

The table is based on information supplied to us by the Selling Stockholder or in Schedules 13G or 13D and other public documents filed with the SEC, with beneficial ownership and percentage ownership determined in accordance with the rules and regulations of the SEC, and includes information with respect to voting or investment power with respect to shares of stock. This information does not necessarily indicate beneficial ownership for any other purpose.

The percentage of the Selling Stockholder's ownership before and after this offering is based on 10,131,798 shares of common stock outstanding as of May 10, 2023.

Name and Address of the Selling Stockholder	No. of Shares of Common Stock Beneficially Owned Prior to this Offering ⁽¹⁾	Percentage of Outstanding Shares of Common Stock Beneficially Owned Prior to this Offering	No. of Shares of Common Stock Offered by Selling Stockholders ⁽¹⁾	No. and Percentage of Outstanding Shares of Common Stock Beneficially Owned Subsequent to this Offering ⁽²⁾
Armistice Capital Master Fund Ltd.	3,733,295 ⁽³⁾	28.79%	1,947,040	1,786,255; 13.77%

(1) Assumes all Warrants are exercised.

(2) We have assumed that the Selling Stockholder will not acquire beneficial ownership of any additional securities issued by us during the Offering.

(3) Consists of: (1) 895,623 shares of common stock; (2) 557,632 shares of common stock underlying the Pre-funded Warrants; (3) 1,947,040 shares of common stock underlying the Warrants and (4) 333,000 shares of common stock underlying the warrants issued in our initial public offering. The securities directly held by Armistice Capital Master Fund Ltd., a Cayman Islands exempted company (the "Master Fund"), may be deemed to be indirectly beneficially owned by (i) Armistice Capital, LLC ("Armistice Capital"), as the investment manager of the Master Fund; and (ii) Steven Boyd, as the Managing Member of Armistice Capital. Armistice Capital and Steven Boyd disclaim beneficial ownership of the securities except to the extent of their respective pecuniary interests therein. The Pre-funded Warrants and the Warrants are subject to a 9.99% and 4.99% beneficial ownership limitation, respectively, that prohibits the Master Fund from exercising any portion of them if, following such exercise, the Master Fund's ownership of our common shares would exceed that ownership limitation. The address of the Master Fund is c/o Armistice Capital, LLC, 510 Madison Avenue, 7th Floor, New York, NY 10022.

PLAN OF DISTRIBUTION

We are registering the shares of common stock issuable to the Selling Stockholder upon the exercise of the Selling Stockholder's Warrants purchased in the Private Placement to permit the resale of these shares of common stock by the holders of the shares of common stock from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the Selling Stockholder of the shares of common stock. We will bear all fees and expenses incident to our obligation to register the shares of common stock.

The Selling Stockholder, which may include donees, pledgees, transferees or other successors-in-interest selling shares of common stock or interests in shares of common stock received after the date of this prospectus from a Selling Stockholder as a gift, pledge, partnership distribution or other transfer, may sell all or a portion of the shares of common stock beneficially owned by them and offered hereby from time to time on any stock exchange, market or trading facility on which the shares are traded or in private transactions.

A Selling Stockholder may use any one or more of the following methods when disposing of shares or interests therein:

- 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;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its own account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- through agreements between broker-dealers and the Selling Stockholder to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted by applicable law.

The Selling Stockholder may, from time to time, pledge or grant a security interest in some or all of the shares of common stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of common stock, from time to time, under this prospectus, or under an amendment to this prospectus under Rule 424(b) or other applicable provision of the Securities Act amending the list of selling stockholders to include the pledgee,

transferee or other successors in interest as selling stockholders under this prospectus. The Selling Stockholder also may transfer the shares of common stock in other circumstances, in which case the pledgees, transferees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

The Selling Stockholder also may resell all or a portion of the 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 connection with the sale of our common stock or interests therein, the Selling Stockholder may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the common stock in the course of hedging the positions they assume. The Selling Stockholder may also sell shares of our common stock short and deliver these securities to close out their short positions, or loan or pledge the common stock to broker-dealers that in turn may sell these securities. The Selling Stockholder may also enter into options or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to each 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).

The aggregate proceeds to the Selling Stockholder from the sale of the common stock offered by them will be the purchase price of the common stock less discounts or commissions, if any. The Selling Stockholder reserves the right to accept and, together with its agents from time to time, to reject, in whole or in part, any proposed purchase of common stock to be made directly or through agents. We will not receive any of the proceeds from this offering.

The Selling Stockholder and any underwriters, broker-dealers or agents that participate in the sale of the common stock or interests therein may be “underwriters” within the meaning of Section 2(11) of the Securities Act. Any discounts, commissions, concessions or profit they earn on any resale of the shares may be underwriting discounts and commissions under the Securities Act. If the Selling Stockholder is an “underwriter” within the meaning of Section 2(11) of the Securities Act, it will be subject to the prospectus delivery requirements of the Securities Act.

To the extent required, the shares of our common stock to be sold, the name of the selling stockholder, the respective purchase prices and public offering prices, the names of any agents, dealer or underwriter, and any applicable commissions or discounts with respect to a particular offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

If underwriters are used in the sale, the shares of common stock will be acquired by the underwriters for their own account and may be resold from time to time in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. In connection with any such underwritten sale of shares of common stock, underwriters may receive compensation from the selling stockholder, for whom they may act as agents, in the form of discounts, concessions or commissions. If the selling stockholder uses an underwriter or underwriters to effectuate the sale of shares of common stock, we and/or it will execute an underwriting agreement with those underwriters at the time of sale of those shares of common stock.

To the extent required by law, the names of the underwriters will be set forth in a prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes the prospectus supplement and the accompanying prospectus used by the underwriters to sell those securities. The obligations of the underwriters to purchase those shares of common stock will be subject to certain conditions precedent, and unless otherwise specified in a prospectus supplement, the underwriters will be obligated to purchase all the shares of common stock offered by such prospectus supplement if any of such shares of common stock are purchased. Any public offering price and any discounts or concessions allowed or re-allowed or paid to dealers may be changed from time to time.

We have advised the Selling Stockholder that the anti-manipulation rules of Regulation M under the Exchange Act may apply to sales of shares in the market and to the activities of the Selling Stockholder and its affiliates. The Selling Stockholder may indemnify any broker-dealer that participates in transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act.

We have agreed to indemnify the Selling Stockholder and certain of its affiliates against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

We have agreed with the Selling Stockholder to keep the registration statement of which this prospectus forms a part effective until the date on which the Selling Stockholder no longer owns the Warrants or the shares of common stock issuable upon exercise thereof, which are covered by such registration statement.

Listing

Our common stock is listed on The Nasdaq Capital Market under the trading symbol “RNXT.”

LEGAL MATTERS

The validity of the issuance of the Securities offered hereby will be passed upon for us by Wilson Sonsini Goodrich & Rosati, Professional Corporation, Palo Alto, California.

EXPERTS

The financial statements of RenovoRx, Inc. as of and for the year ended December 31, 2022 and 2021 incorporated by reference in this registration statement, have been audited by Baker Tilly US, LLP, an independent registered public accounting firm, as set forth in their report thereon incorporated by reference in this registration statement, in reliance upon such report and upon the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-3 (File No. 333-271882), of which this prospectus is a part, under the Securities Act, to register the shares of common stock offered by this prospectus. However, this prospectus does not contain all of the information contained in the Registration Statement. We have omitted from this prospectus some parts of the Registration Statement as permitted by the rules and regulations of the SEC. Statements in this prospectus concerning any document we have filed as an exhibit to the Registration Statement or that we otherwise filed with the SEC are not intended to be comprehensive and are qualified in their entirety by reference to these filings. In addition, we file annual, quarterly and other reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC’s website at www.sec.gov. Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, and Current Reports on Form 8-K, including any amendments to those reports, and other information that we file with or furnish to the SEC pursuant to Section 13(a) or 15(d) of the Exchange Act can also be accessed free of charge through the Internet. These filings will be available as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, including any amendments to those reports, and other information that we file with or furnish to the SEC pursuant to Section 13(a) or 15(d) of the Exchange Act, can also be accessed free of charge from our website at <http://www.renovorx.com>. These filings will be available as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. Information

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC's rules allow us to "incorporate by reference" information into this prospectus, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is deemed to be part of this prospectus, and subsequent information that we file with the SEC will automatically update and supersede that information. Any statement contained in a previously filed document incorporated by reference will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus modifies or replaces that statement.

This prospectus and any accompanying prospectus supplement incorporate by reference the documents set forth below that have previously been filed with the SEC:

- our Annual Report on [Form 10-K](#) for the year ended December 31, 2022, filed with the SEC on March 31, 2023;
- our Quarterly Reports on [Form 10-Q](#) for the quarter ended March 31, 2023, filed with the SEC on May 12, 2023;
- our Current Reports on Form 8-K, which were filed with the SEC on [April 3, 2023](#) and [April 27, 2023](#); and
- the description of our common stock set forth in our registration statement on [Form 8-A](#), filed with the SEC on August 11, 2021, including any amendments thereto or reports filed for the purposes of updating this description.

Any documents we file with the SEC pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of the initial registration statement of which this prospectus forms a part and prior to effectiveness of the registration statement, as well as subsequent to the effectiveness of the registration statement and prior to the termination of the offering of our securities to which this prospectus relates, will automatically be deemed to be incorporated by reference into this prospectus and to be part hereof from the date of filing those documents. We are not, however, incorporating by reference any documents or portions thereof that are not deemed "filed" with the SEC, including any information furnished pursuant to Item 2.02 or Item 7.01 of Form 8-K or related exhibits furnished pursuant to Item 9.01 of Form 8-K. Any statements in any such future filings will automatically be deemed to modify and supersede any information in any document we previously filed with the SEC that is incorporated or deemed to be incorporated herein by reference to the extent that statements in the later filed document modify or replace such earlier statements.

You can request a copy of these filings, at no cost, by writing or telephoning us at the following address or telephone number:

RenovoRx, Inc.
Attn: Investor Relations
4546 El Camino Real, Suite B1
Los Altos, California 94022
650-284-4433

The information accessible through any website referred to in this prospectus or any document incorporated herein is not, and should not be deemed to be, a part of this prospectus.

RENOVO | RX

1,947,040 SHARES OF COMMON STOCK

Offered by the Selling Stockholder

PROSPECTUS

May 19, 2023
