

PROSPECTUS

ALAUNOS™
THERAPEUTICS

Up to 327,740 Shares of Common Stock

This prospectus relates to the potential resale from time to time by Mast Hill Fund, L.P. (“Mast Hill” or the “Selling Stockholder”), at prices and on terms that will be determined at the time of any such offering, of up to 327,740 shares of our common stock, par value \$0.001 per share, which includes (1) up to 247,840 shares of our common stock (the “Purchase Shares”) that may be issued to Mast Hill Fund, L.P. (“Mast Hill”) from time to time pursuant to the Equity Purchase Agreement, dated as of May 19, 2025 (the “Purchase Agreement”), and (2) up to 79,900 shares of our common stock, upon the exercise of the common stock purchase warrant (as amended, the “Warrant”) issued to Mast Hill under the Purchase Agreement (the “Warrant Shares”).

Under the Purchase Agreement, we may elect to sell common stock to Mast Hill in an aggregate amount up to \$25,000,000, over a period of up to 24 months commencing on the Commencement Date (as defined in the Purchase Agreement) and after satisfaction of other conditions in the Purchase Agreement. The five-year Warrant is immediately exercisable and has an initial exercise price per share of \$4.00. The exercise price and number of shares of common stock issuable upon exercise is subject to appropriate adjustment in the event of certain stock dividends and distributions, stock splits, stock combinations, reclassifications or similar events affecting the common stock and anti-dilution adjustments. The Purchase Shares and the Warrant Shares being registered under this prospectus are being registered in accordance with our obligations under the Registration Rights Agreement entered into in connection with the Purchase Agreement. See “*The Equity Financing*” for a description of the Purchase Agreement and Warrant and see “*Selling Stockholder*” for additional information regarding the Selling Stockholder.

Under the applicable rules of The Nasdaq Stock Market LLC (“Nasdaq”), in no event may we issue to the Selling Stockholder shares of our common stock representing more than 19.99% of the total number of shares of common stock outstanding as of the date of the Purchase Agreement, unless (i) we obtain the approval of the issuance of such shares by our stockholders in accordance with the applicable Nasdaq rules or (ii) or unless certain exceptions apply, such as if the securities were sold at or above the price paid under the Purchase Agreement for an “at market” issuance under Nasdaq rules.

We are not selling any securities under this prospectus and will not receive any of the proceeds from the sale of the shares of our common stock by the Selling Stockholder. However, we may receive up to an aggregate of \$25 million in proceeds from the sale of our common stock to the Selling Stockholder pursuant to the Purchase Agreement and up to \$319,600 in proceeds if the Selling Stockholder exercises the Common Stock Purchase Warrant at \$4.00 per share.

The Selling Stockholder may offer, sell or distribute all or a portion of the shares of our common stock acquired under the Purchase Agreement and hereby registered publicly or through private transactions at prevailing market prices or at negotiated prices. The actual proceeds from the Selling Stockholder may be less than this amount depending on the number of shares of our common stock sold and the price at which the shares of our common stock are sold.

We will bear all costs, expenses and fees in connection with the registration of the shares of our common stock, including with regard to compliance with state securities or “blue sky” laws. The timing and amount of any sales are within the sole discretion of the Selling Stockholder. The Selling Stockholder is an underwriter under the Securities Act with respect to the resale of shares held by it. Although the Selling Stockholder is obligated to purchase shares of our common stock under the terms and subject to the conditions and limitations of the Purchase Agreement to the extent we choose to sell such shares of our common stock to it (subject to certain conditions), there can be no assurances that we will choose to sell any shares of our common stock to the Selling Stockholder, or that the Selling Stockholder will sell any or all of the shares of our common stock, if any, purchased under the Purchase Agreement pursuant to this prospectus. The Selling Stockholder will bear all commissions and discounts, if any, attributable to its sale of shares of our common stock. See “*Plan of Distribution.*”

Our common stock is listed on The Nasdaq Capital Market under the symbol “TRCT.” On December 10, 2025, the last reported sale price of our common stock on The Nasdaq Capital Market was \$4.31 per share.

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading “*Risk Factors*” beginning on page 11 of this prospectus, and under similar headings in any amendment or supplement to this prospectus or in any other 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.

This prospectus is being filed pursuant to Rule 424(b)(8) under the Securities Act of 1933, as amended, to provide the final, clean prospectus following the automatic effectiveness of the registration statement on November 10, 2025 (20 calendar days after filing on October 21, 2025).

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ABOUT THIS PROSPECTUS

The registration statement we filed with the Securities and Exchange Commission, or the SEC, includes exhibits that provide more detail of the matters discussed in this prospectus. You should read this prospectus, the related exhibits filed with the SEC, and the documents incorporated by reference herein before making your investment decision. You should rely only on the information provided in this prospectus and the documents incorporated by reference herein or any amendment thereto.

You should not assume that the information contained in this prospectus is accurate on any date subsequent to the date set forth on the front of the document or that any information we have incorporated by reference herein or therein is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus is delivered, or securities are sold, on a later date. This prospectus contains or incorporates by reference summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been or will be filed or have been or will be incorporated by reference as exhibits to the registration statement of which this prospectus forms a part, and you may obtain copies of those documents as described in this prospectus under the heading “*Where You Can Find More Information.*”

You should rely only on the information that we have included or incorporated by reference in this prospectus. Neither we nor the Selling Stockholder has authorized any other person to provide you with different information. If anyone provides you with additional, different or inconsistent information, you should not rely on it. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Unless otherwise indicated, information contained in or incorporated by reference into this prospectus concerning our business and the industry and markets in which we operate, including with respect to our business prospects, our market position and opportunity, and the competitive landscape, is based on information from our management’s estimates, as well as from industry publications, surveys, and studies conducted by third parties. Our management’s estimates are derived from publicly available information, their knowledge of our business and industry, and assumptions based on such information and knowledge, which they believe to be reasonable. In addition, while we believe that information contained in the industry publications, surveys, and studies has been obtained from reliable sources, we have not independently verified any of the data contained in these third-party sources, and the accuracy and completeness of the information contained in these sources is not guaranteed. Although we are not aware of any misstatements regarding the market and industry data presented in this prospectus and the documents incorporated herein by reference, these estimates involve risks and uncertainties and are subject to change based on various factors, including those discussed under the heading “Risk Factors” in this prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus, including in our Annual Report on Form 10-K filed on March 31, 2025, as amended on April 30, 2025, and our Quarterly Reports on Form 10-Q and Current Reports on Form 8-K. Accordingly, you should not place undue reliance on this information.

PROSPECTUS SUMMARY

This summary highlights certain information about us, this offering, and information contained elsewhere in this prospectus and in the documents we incorporate by reference. This summary is not complete and does not contain all of the information that you should consider before making an investment decision. To fully understand this offering and its consequences to you, you should read this entire prospectus carefully, including the factors described under the heading “Risk Factors” in this prospectus beginning on page 18, in our Annual Report on Form 10-K filed on March 31, 2025, as amended on April 30, 2025, our Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and the financial statements and all other information incorporated by reference in this prospectus. When used in this prospectus, except where the context otherwise requires, the terms the “Company,” “we,” “us,” “our,” “Alaunos,” or similar terms refer to Alaunos Therapeutics, Inc.

Company Overview

On October 10, 2024, we announced our continued progress and evaluation of our internally developed small molecule oral obesity program. The aim of this program is to develop a drug for obesity with a differentiated profile relative to currently marketed and in development oral and injectable products.

We have also operated as a clinical-stage oncology-focused cell therapy company developing adoptive TCR-T cell therapy, designed to treat multiple solid tumor types in large cancer patient populations with unmet clinical needs. On August 14, 2023, we announced a strategic reprioritization of our business and wind down of our TCR-T Library Phase 1/2 Trial.

In connection with the reprioritization, we reduced our workforce during the third and fourth quarters of 2023, and we continue working to reduce costs in order to extend our cash runway. We continue to explore strategic alternatives, including, but not limited to, an acquisition, merger, reverse merger, sale of assets, strategic partnerships, capital raises or other transactions.

We have not generated any product revenue and have incurred significant net losses in each year since our inception. For the six months ended June 30, 2025, we had a net loss of \$2.1 million, and as of June 30, 2025, we have incurred approximately \$922.6 million of accumulated deficit since our inception in 2003. We expect to continue to incur significant operating expenditures and net losses for the foreseeable future.

Small Molecule Oral Obesity Program

We are advancing our internally developed, preclinical small molecule program for the treatment of obesity and related metabolic disorders. This program focuses on discovering and developing novel, orally administered therapeutics with the potential for a differentiated and complementary profile compared to currently available therapies. While other pipeline therapies for obesity explore alternative hormonal pathways such as amylin or dual GIP/GLP-1 receptor agonism, our approach is focused on a non-hormonal mechanism of action. The program seeks to develop an oral therapeutic with the potential to address certain limitations of existing hormonal therapies, including the potential for preservation of lean muscle mass during weight loss and an improved tolerability profile.

During the fourth quarter of 2024, we engaged a contract development and manufacturing organization (CDMO) to synthesize active pharmaceutical ingredients (APIs) for our product candidates. We have since initiated a portfolio of preclinical studies to evaluate these product candidates. Initial in vitro characterization studies conducted by a contract research organization (CRO) encountered methodological issues related to the assay, which prevented the generation of conclusive data. This CRO has since completed the necessary method development to resolve these issues, and these studies are being repeated. In parallel, we have conducted an in vivo pharmacokinetic (PK) study of our product candidate ALN1003 and have initiated a pilot in vivo proof-of-concept (PoC) study of ALN1003 in a diet-induced obesity (DIO) mouse model.

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Collectively, these ongoing studies are designed to assess our candidates' effects on key biological pathways implicated in metabolic disease, including receptor binding, lipid accumulation, food consumption, weight loss, and the expression of genes related to thermogenesis and energy expenditure. We anticipate initial data from these ongoing in vitro and in vivo studies will be available no later than the fourth quarter of 2025. These data are intended to inform the future development strategy for our product candidates and guide indication selection.

The advancement of this program is subject to numerous risks and uncertainties inherent in early-stage drug development. Subject to favorable data from these preclinical studies and our ability to secure additional capital, we plan to advance a selected development candidate into formal investigational new drug (IND)-enabling studies. We intend to actively explore strategic financing and collaboration opportunities to fund the continued development of this program.

Obesity Market

Obesity remains one of the most pressing public health challenges globally, with rates continuing to rise across many regions, particularly in the United States, Europe, and parts of Asia. It is closely linked to a range of comorbid conditions, including type 2 diabetes, cardiovascular diseases, and certain cancers, which exacerbates the overall healthcare burden. The obesity market is seeing increased attention, driven by growing awareness, better treatment options, and emerging scientific breakthroughs.

The global obesity market is experiencing rapid growth. Globally, the market size for branded obesity drugs was \$6 billion in 2023 and is estimated that it will reach \$105.0 billion by 2030. This growth is fueled by the rising obesity prevalence, evolving patient demographics, and increasing demand for effective weight-management solutions. The shift toward more personalized treatments and the need for long-term weight management are key drivers of this growth.

The current treatment landscape for obesity consists of a combination of lifestyle interventions, pharmaceuticals, and surgical options. Lifestyle interventions—dietary changes and physical activity—are the first-line treatment for most individuals, but many struggle to achieve and maintain significant weight loss through these methods alone.

Traditional weight-loss medications (e.g., OrlistatTM) are still used, though their side effects and modest results have limited their appeal. Newer drugs, like GLP-1 receptor agonists (e.g., OzempicTM, WegovyTM), are quickly becoming the gold standard in the market. These drugs, which mimic the action of gut hormones to promote satiety and reduce appetite, have shown remarkable efficacy in clinical trials and are significantly improving patient outcomes.

The success of GLP-1s has led to a surge in interest from both pharmaceutical companies and patients. However, issues such as high cost, insurance reimbursement, and potential long-term side effects remain areas of concern.

The future of the obesity market is promising, with new therapies, enhanced patient targeting, and continued scientific breakthroughs on the horizon. As the global obesity epidemic continues to grow, demand for more effective and affordable treatments will likely continue to rise. However, success will depend on overcoming challenges related to cost, access, and patient adherence. Advancements in personalized medicine, non-invasive treatments, and innovative drug mechanisms will shape the next phase of the obesity treatment landscape.

The obesity market today is vibrant and expanding, but still in need of accessible, scalable, and sustainable solutions to effectively manage this complex and widespread health issue.

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Historical Development and Achievements in Cancer Therapeutics

We previously focused on developing TCR-T cell therapies for solid tumors using our non-viral Sleeping Beauty platform and hunTR[®] TCR discovery platform. Key milestones included:

- TCR-T Library Phase 1/2 Trial (2022-2023): Treated eight patients with solid tumors (e.g., pancreatic, colorectal, lung). The trial showed TCR-T cells were well-tolerated, with no dose-limiting toxicities or neurotoxicity. Cytokine release syndrome (grades 1-3) resolved with standard care. One non-small cell lung cancer patient achieved a partial response (13% response rate), and six others had stable disease (87% disease control rate), establishing proof-of-concept that Sleeping Beauty TCR-T cells can result in objective clinical responses and recognize established tumors *in vivo*.
- hunTR[®] Platform: Identified proprietary TCRs targeting driver mutations (KRAS, TP53, others) and various HLAs, expanding the TCR library for potential patient treatment.

In August 2023, however, due to substantial development costs and a challenging financing environment, we announced a strategic reprioritization, including the wind-down of our TCR-T Library Phase 1/2 Trial and cessation of further clinical development of TCR-T programs. This involved:

- Workforce reductions (approximately 95% by the end of 2023) and cost-cutting measures to extend cash runway.
- Termination of key licenses and agreements:
 - NCI patent license (effective December 26, 2023), after internally developing proprietary TCRs via hunTR targeting similar mutations.
 - NCI CRADA (effective October 13, 2023).
 - Precigen exclusive license (fully terminated October 4, 2024, following an amendment in April 2023 that eliminated royalty/milestone obligations).
- Trial close-out activities, including internal processes, with ongoing costs for long-term follow-up and regulatory obligations.

As a result, research and development expenses related to cancer programs have significantly declined, from \$11.7 million for the six months ended June 30, 2023, to \$0.3 million for the same period in 2025, reflecting the shift away from active oncology development.

We are actively exploring strategic alternatives to maximize stockholder value, including but not limited to acquisitions, mergers, reverse mergers, asset sales, strategic partnerships, or capital raises. These may involve monetizing cancer-related assets, such as out-licensing the TCR library or hunTR platform. We have engaged Cantor Fitzgerald & Co. as a strategic advisor for this process. However, there are no assurances that any transaction will be consummated, and failure to do so could lead to further operational curtailment or dissolution. Our primary focus has shifted to our preclinical small-molecule obesity and metabolic disorder program, with ongoing preclinical *in vitro* and *in vivo* studies.

Selected Risks Related to our Business

Our business is subject to numerous risks, including risks that may prevent us from achieving our business objectives or may adversely affect our business, financial condition, results of operations, cash flows and prospects that you should consider before making an investment decision. Some of the more significant risks and uncertainties relating to an investment in our company are listed below. These risks are more fully described in the section titled “*Risk Factors*” in this prospectus and in Part I, Item 1A of our Annual Report on Form 10-K for the year ended December 31, 2024, and in Part II, Item 1A of our Quarterly Reports on Form 10-Q for the fiscal quarters ended March 31, 2025 and June 30, 2025, which are incorporated by reference into this prospectus.

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Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations. You should be able to bear a complete loss of your investment.

- Our strategic reprioritization may not be successful, may not yield the desired results and we may be unsuccessful in identifying and implementing any strategic transaction.
- If a strategic transaction is not consummated, our board of directors (“*Board*”) may decide to pursue a dissolution and liquidation. In such an event, the amount of cash available for distribution to our stockholders will depend heavily on the timing of such liquidation as well as the amount of cash that will need to be reserved for commitments and contingent liabilities.
- We may require substantial additional financial resources to continue as a going concern, including through the strategic review process, and if we raise additional funds it may affect the value of your investment in our common stock.
- Our ability to consummate a strategic transaction depends on our ability to retain our current employees and consultants.
- Our stock price has been, and may continue to be, volatile.
- Our decreasing cash reserves had resulted in our shareholder equity falling below \$2,500,000 as required by Nasdaq Listing Rule 5550(b) (1), which resulted in our receipt of a delisting notice from Nasdaq in April of 2025. While we have reestablished compliance with the listing rule based on our Quarterly Report on Form 10-Q for the period ended June 30, 2025, evidencing stockholders’ equity of \$3.66 million, we remain at risk of future non-compliance if our cash reserves continue to decline or if we face unexpected financial challenges, which could lead to further delisting actions by Nasdaq.
- We have identified a material weakness and failed to maintain an effective internal control environment, which may result in material misstatements of our financial statements or have a material adverse effect on our business or stock price.
- Our small molecule obesity program is early stage and may encounter issues with manufacturing of the active pharmaceutical ingredient(s) or with the in vitro or in vivo studies that could preclude clinical trials or be costly to address with respect to time or money.
- For our small molecule oral obesity program or should we resume development of our TCR-T product candidates, any candidate for which we obtain marketing approval could be subject to post-marketing restrictions or withdrawal from the market and we may be subject to significant penalties if we fail to comply with regulatory requirements or if we experience unanticipated problems with our products, when and if any of them are approved.
- For our small molecule oral obesity program, or should we resume development of our TCR-T product candidates, if we fail to obtain the necessary U.S. or worldwide regulatory approvals to commercialize any product candidate, our business will suffer materially.
- We may not be able to commercialize, generate significant revenues from, or attain profitability from our small molecule oral obesity program or, should we resume development of, our TCR-T product candidates.
- The termination of our TCR-T related licenses and research and development agreements could limit our ability to resume our TCR-T clinical trial or begin new clinical trials.
- We may become involved in litigation, including securities class action litigation, that could divert management’s attention and harm our business, and insurance coverage may not be sufficient to cover all costs and damages.
- Our product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit the commercial profile of an approved label or result in significant negative consequences following any potential marketing approval.

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- The gene transfer vectors from the Sleeping Beauty system used to manufacture our TCR-T product candidates may incorrectly modify the genetic material of a patient's T cells, potentially triggering the development of a new cancer or other adverse events.
- If we are unable either to create sales, marketing and distribution capabilities or enter into agreements with third parties to perform these functions, we will be unable to commercialize our product candidates successfully.
- If physicians and patients do not accept and use our product candidates, once approved, or if we do not obtain coverage and adequate reimbursement from payors, our ability to generate revenue from sales of our products will be materially and adversely impaired.
- Our small molecule and immuno-oncology product candidates may face competition in the future from generics or biosimilars and/or new technologies and our pending patent applications may not be granted, further limiting our ability to compete with other companies.
- If we fail to adequately protect or enforce our intellectual property rights or secure rights to patents of others, the value of our intellectual property rights would diminish and our ability to successfully commercialize our products may be materially impaired.
- Third-party claims of intellectual property infringement would require us to spend significant time and money and could prevent us from developing or commercializing our products.
- We have and will rely significantly on information technology and any failure, inadequacy, interruption or security lapse of that technology or loss of data, including any cybersecurity incidents, could compromise sensitive information related to our business, prevent us from accessing critical information or expose us to liability which could harm our ability to operate our business effectively and materially and adversely affect our business and reputation.
- Anti-takeover provisions in our charter documents and under Delaware law may make an acquisition of us, which may be beneficial to our stockholders, more difficult.
- Our amended and restated bylaws provide that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.
- Because we do not expect to pay dividends, you will not realize any income from an investment in our common stock unless and until you sell your shares at a profit.
- Our ability to use net operating loss carryforwards and research tax credits to reduce future tax payments may be limited or restricted.
- The exercise of outstanding warrants, and issuance of equity awards may have a dilutive effect on our stock, and negatively and materially impact the price of our common stock.
- Our principal stockholders, executive officers and directors have substantial control over the Company, which may prevent you and other stockholders from influencing significant corporate decisions and may significantly harm the market price of our common stock.
- We are a "smaller reporting company," and the reduced disclosure requirements applicable to smaller reporting companies may make our common stock less attractive to investors.
- other risks described from time to time in periodic and current reports that we file with the SEC.

The Mast Hill Transaction

On May 19, 2025, we entered into an equity purchase agreement (the "Purchase Agreement") and a registration rights agreement (the "Registration Rights Agreement") with Mast Hill Fund, L.P., a Delaware limited

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partnership (“Mast Hill”). Pursuant to the Purchase Agreement, Mast Hill has committed to purchase up to \$25,000,000 of the Company’s newly issued shares common stock, par value \$0.001 per share (the “common stock”), from time to time during the term of the Purchase Agreement, subject to certain limitations and conditions (the “Mast Hill Offering”).

The Purchase Agreement initially precludes us from issuing and selling more than 327,740 shares of our common stock, including the Warrant Shares, which number equals 19.99% of our common stock issued and outstanding as of May 18, 2025, unless we obtain stockholder approval to issue additional shares, or unless certain exceptions apply. One such exception applies where the average price paid for all shares of common stock issued under the Purchase Agreement (including both Purchase Shares and the Warrant Shares) is equal to or greater than \$2.40, which is a price equal to the lower of (i) the Nasdaq Official Closing Price immediately preceding the execution of the Purchase Agreement and (ii) the average Nasdaq Official Closing Price of our common stock for the five trading days immediately preceding the execution of the Purchase Agreement, as calculated in accordance with the rules of Nasdaq, such that the sales of such common stock to the Selling Stockholder would not count toward such limit because they are “at market” under applicable stock exchange rules.

In addition, a beneficial ownership limitation in the agreement initially limits us from directing Mast Hill to purchase shares of common stock if such purchases would result in Mast Hill beneficially owning more than 4.99% of the then-outstanding shares of our common stock.

Upon the terms and subject to the satisfaction of the conditions set forth in the Purchase Agreement, the Company has the right, but not the obligation, to sell to Mast Hill, and Mast Hill is obligated to purchase, up to \$25,000,000 of common stock, at a purchase price per share equal to the lesser of (i) 97% of the lowest VWAP of the Company’s common stock, as listed on Nasdaq, on any trading day during the period beginning on the put date and continuing through the date that is two trading days immediately following the clearing date associated with the applicable put notice (such two trading day period is the “*Valuation Period*”), or (ii) 102% of the lowest traded price of the Company’s common stock, as listed on Nasdaq, on any trading day during the Valuation Period, on such date on which the purchase price is calculated in accordance with the terms of the Purchase Agreement. Such sales of common stock by the Company, if any, are subject to certain limitations set forth in the Purchase Agreement, and may occur from time to time, at the Company’s sole discretion, over a period of up to 24-months, commencing on the date of the Purchase Agreement, including the effectiveness of a registration statement registering under the Securities Act, the resale by Mast Hill of shares of common stock that may be issued by the Company to Mast Hill under the Purchase Agreement and upon the exercise of the Warrant (as defined below). The Company has agreed to file such registration statement with the Securities and Exchange Commission within 60 days from the date of execution of the Purchase Agreement and the Registration Rights Agreement. We will control the timing and amount of any such sales of common stock to Mast Hill. Actual sales of shares of common stock to Mast Hill will depend on a variety of factors to be determined by us from time to time, including, among other things, market conditions, the trading price of our common stock, and determinations by us as to the appropriate sources of funding for the Company and our operations.

We have the right to terminate the Purchase Agreement at any time after its commencement, at no cost or penalty, upon prior written notice to Mast Hill, except during any Valuation Period or at any time that Mast Hill holds any shares of common stock purchased by Mast Hill under the Purchase Agreement.

As consideration for Mast Hill’s commitment to purchase shares of common stock in accordance with the Purchase Agreement, the Company has issued to Mast Hill a warrant to purchase 79,900 shares of common stock (as amended, the “Warrant”) concurrently with the execution of the Purchase Agreement. The Warrant is immediately exercisable and will expire on the fifth anniversary of the original issuance date. The Warrant has an initial exercise price per share of \$4.00. The exercise price and number of shares of common stock issuable upon exercise is subject to appropriate adjustment in the event of certain stock dividends and distributions, stock splits, stock combinations, reclassifications or similar events affecting the common stock and anti-dilution adjustments. On June 9, 2025, the Company entered into an Amendment No. 1 to the common stock Purchase Warrant Issued on May 19, 2025 (the “Warrant Amendment”) with Mast Hill. The Warrant Amendment (i) added a floor price

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equal to \$0.57 per share, with respect to certain adjustment to the exercise price of the Warrant in the event of any Dilutive Issuance (as defined in the Warrant), issuance of Variable Price (as defined in the Warrant) securities and certain other events set forth in Section 2(e) of the Warrant; (ii) removed the requirement to adjust the number of shares of common stock issuable upon exercise of the Warrant in the event of a Dilutive Issuance, a Variable Price adjustment or under Section 2(e) of the Warrant; and (iii) removed certain rights of the Warrant holder in connection with fundamental transactions.

We intend to use the net proceeds, if any, from the Mast Hill Offering for working capital and general corporate purposes, including sales and marketing activities, product development and capital expenditures. We may also use a portion of the net proceeds to acquire or invest in complementary businesses, products and technologies. The Purchase Agreement and the Registration Rights Agreement contain customary representations, warranties, conditions and indemnification obligations of the parties.

Corporate Information

We originally incorporated in Colorado in September 1998 (under the name Net Escapes, Inc.) and later changed our name to “EasyWeb, Inc.” in February 1999. We re-incorporated in Delaware on May 16, 2005 under the same name. On September 13, 2005, we completed a “reverse” acquisition of privately held Ziopharm, Inc., a Delaware corporation. To effect this transaction, we caused ZIO Acquisition Corp., our wholly-owned subsidiary, to merge with and into Ziopharm, Inc., with Ziopharm, Inc. surviving as our wholly owned subsidiary. Following the merger, we caused Ziopharm, Inc. to merge with and into us and we changed our name to “Ziopharm Oncology, Inc.” As a result, Ziopharm, Inc. became the registrant with the Securities and Exchange Commission, or the SEC, and the historical financial statements of Ziopharm, Inc. became our historical financial statements. On January 25, 2022, we filed a Certificate of Amendment to our Amended and Restated Certificate of Incorporation with the Delaware Secretary of State to change our name to Alaunos Therapeutics, Inc.

Our principal executive offices are located at 501 E. Las Olas Blvd., Suite 300, Fort Lauderdale, FL 33301, and our telephone number is (346) 355-4099.

Our corporate website address is www.alaunos.com. We make available on or through our website our periodic reports that we file with the SEC. Information contained in, or accessible through, our website is not a part of this prospectus, and the inclusion of our website address in this prospectus is an inactive textual reference only. The contents of our website are not incorporated by reference into this document and shall not be deemed “filed” under the Securities Exchange Act of 1934, as amended (the “*Exchange Act*”).

THE OFFERING

The following summary contains basic information about this offering. The summary is not intended to be complete. You should read the full text and more specific details contained elsewhere in this prospectus.

Shares of common stock offering by the Selling Stockholder	327,740 shares of our common stock, par value \$0.001 per share, which includes (1) up to 247,840 Purchase Shares that may be issued to Mast Hill from time to time pursuant to the Purchase Agreement, and (2) up to 79,900 Warrant Shares, upon the exercise of the Warrant issued to Mast Hill under the Purchase Agreement.
Shares of common stock outstanding immediately prior to this offering	2,321,829 shares (as of October 20, 2025)
Terms of the offering	The Selling Stockholder will determine when and how it will dispose of any shares of our common stock that are registered under this prospectus for resale. See “Plan of Distribution.”
Use of proceeds	We will not receive any of the proceeds from the sale of shares of our common stock offered by the Selling Stockholder. However, we may receive up to an aggregate of \$25 million in proceeds from the sale of our common stock to the Selling Stockholder pursuant to the Purchase Agreement and up to \$319,600 in proceeds if the Selling Stockholder exercises the Common Stock Purchase Warrant at \$4.00 per share. However, the actual proceeds may be less than this amount depending on the number of shares of our common stock sold and the price at which the shares of our common stock are sold. We intend to use any net proceeds that we receive under the Purchase Agreement for working capital and other general corporate purposes. However, as of the date of this prospectus, we cannot specify with certainty all of the particular uses, and the respective amounts we may allocate to those uses, for any net proceeds we receive. See “Use of Proceeds.”
Risk factors	Investing in our securities is highly speculative and involves a high degree of risk. You should carefully consider the information set forth in the “Risk Factors” section beginning on page 11 of this prospectus, and in the documents incorporated herein and therein by reference.
Nasdaq Capital Market symbol	Our shares of common stock are traded on The Nasdaq Capital Market under the symbol “TCRT”.

Outstanding Shares

The number of shares of our common stock to be outstanding after this offering is based on 2,321,829 shares of our common stock outstanding as of October 20, 2025, and excludes:

- 136,327 shares of Common Stock issuable upon the exercise of outstanding warrants to purchase our Common Stock, with a weighted average exercise price of \$7.52 per share;
- 229,128 shares of Common Stock issuable upon exercise of outstanding stock options under our equity incentive plan, with a weighted average exercise price of \$29.04 per share;
- 217,390 shares of Common Stock issuable upon the conversion of the Company’s Series A-1 Convertible Preferred Stock;

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- 227,170 shares of Common Stock issuable upon the conversion of the Company's Series A-2 Convertible Preferred Stock.

Unless otherwise indicated, all information in this prospectus assumes no exercise of the outstanding Series A-1 and Series A-2 Convertible Preferred Stock, stock options or warrants described above.

RISK FACTORS

Investing in our securities involves a high degree of risk. This prospectus does not describe all of those risks. You should consider the risk factors described in this prospectus, as well as those described under the caption “Risk Factors” in the documents incorporated by reference herein, including our Annual Report on Form 10-K filed on March 31, 2025, as amended on April 30, 2025, and our subsequent Quarterly Reports on Form 10-Q and Current Reports on Form 8-K filed with the SEC, together with other information contained in or incorporated by reference in this prospectus, the information and documents incorporated by reference herein. The occurrence of any of the events or developments described below could materially and adversely affect our business, financial condition, results of operations and prospects. In such an event, the market price of our common stock could decline and you may lose all or part of your investment.

Risks Related to Our common stock and this Offering

It is not possible to predict the actual number of shares we will sell under the Purchase Agreement to Mast Hill, or the actual gross proceeds resulting from those sales.

On May 19, 2025, we entered into the Purchase Agreement with Mast Hill, pursuant to which Mast Hill committed to purchase up to \$25,000,000 in shares of our common stock, subject to certain limitations and conditions set forth in the Purchase Agreement. We generally have the right to control the timing and amount of any sales of our shares of common stock to Mast Hill under the Purchase Agreement, although we are unable to control the market price of the common stock at the time such shares are sold or the purchase price per share that Mast Hill will pay for such shares. Our decision to sell shares of common stock under the Purchase Agreement, if any, to Mast Hill will depend upon market conditions, the trading price of the common stock, determinations by us as to the appropriate sources of funding for our operations, and other factors to be determined by us. We may ultimately decide to sell to Mast Hill all, some, or none of the Purchase Shares that may be available for us to sell pursuant to the Purchase Agreement.

Moreover, although the Purchase Agreement provides that we may sell up to an aggregate of \$25,000,000 of Purchase Shares to Mast Hill, we are precluded from issuing and selling more than 327,740 shares of our common stock (including the Warrant Shares), which number equals 19.99% of the number of shares of our common stock issued and outstanding as of May 19, 2025 (the “Exchange Cap”), unless we obtain stockholder approval to issue shares of our common stock in excess of the Exchange Cap or unless another exception applies such as “at market” issuances. If, after the Commencement Date, we elect to sell to Mast Hill all of the Purchase Shares permitted under the Purchase Agreement, the actual gross proceeds from the sale of all such Mast Hill may be substantially less than the \$25,000,000 total commitment in light of the Exchange Cap limitation, which could materially adversely affect our liquidity.

Further, because the purchase price per share to be paid by Mast Hill for the Purchase Shares that we may elect to sell to them under the Purchase Agreement, if any, will fluctuate based on the market prices of our common stock during the three consecutive trading day period immediately following the exercise date for such purchase made pursuant to the Purchase Agreement, it is not possible for us to predict, as of the date of this prospectus and prior to any such sales, the number of shares of common stock that we will sell to Mast Hill thereunder, if any, the purchase price per share that Mast Hill will pay for such shares, or the aggregate gross proceeds that we will receive from those purchases, if any.

The Selling Stockholder will pay less than the then-prevailing market price for our common stock, which could cause the price of our common stock to decline.

The purchase price of our common stock to be sold to the Selling Stockholder under the Purchase Agreement is derived from the market price of our common stock on Nasdaq. Shares to be sold to the Selling Stockholder pursuant to the Purchase Agreement will be purchased at a discounted price.

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Upon the terms and subject to the satisfaction of the conditions set forth in the Purchase Agreement, the Company has the right, but not the obligation, to sell to Mast Hill, and Mast Hill is obligated to purchase, up to \$25,000,000 of common stock, at a purchase price per share equal to the lesser of (i) 97% of the lowest VWAP of the Company's common stock, as listed on Nasdaq, on any trading day during the period beginning on the put date and continuing through the date that is two trading days immediately following the clearing date associated with the applicable put notice (such two trading day period is the "Valuation Period"), or (ii) 102% of the lowest traded price of the Company's common stock, as listed on Nasdaq, on any trading day during the Valuation Period, on such date on which the purchase price is calculated in accordance with the terms of the Purchase Agreement.

As a result of this pricing structure, the Selling Stockholder may sell the shares they receive immediately after receipt of such shares, which could cause the price of our common stock to decrease.

Management has broad discretion as to the use of proceeds from our sale of the Purchase Shares and Warrant Shares under the Purchase Agreement, if any, and may invest or spend the proceeds in ways with which you do not agree and in ways that may not increase the value of your investment.

Our management has broad discretion over the use of proceeds from the sale of any shares of common stock to Mast Hill pursuant to the Purchase Agreement and from the exercise of the Warrant. You may not agree with our decisions, and our use of the proceeds may not yield any return on your investment. Our failure to effectively apply the net proceeds from such sale could compromise our ability to pursue our business strategy, and we might not be able to yield a significant return, if any, on our investment of these net proceeds. In addition, the net proceeds from such sale may not be sufficient for our anticipated uses, and we may need additional resources to progress our service offerings to the stage we expect. You will not have the opportunity to influence our decisions on how to use our net proceeds from any sale of shares of common stock to Mast Hill pursuant to the Purchase Agreement and from the exercise of the Warrant.

The sale or issuance of the securities registered for resale hereunder, or the perception that such sales may occur, could cause the price of our common stock to decrease.

The sale of shares of our common stock to Mast Hill as Purchase Shares under the Purchase Agreement will be at our sole discretion from time to time, commencing after the satisfaction of certain conditions set forth in the Purchase Agreement until May 19, 2027. The purchase price for the Purchase Shares that we may sell to Mast Hill under the Purchase Agreement will fluctuate based on the trading price of our common stock. Depending on market liquidity at the time, sales of such Purchase Shares may cause the trading price of our common stock to decrease. We generally have the right to control the timing and amount of any future sales of Purchase Shares to Mast Hill. We may ultimately decide to sell to Mast Hill all, some or none of the Purchase Shares that may be available for us to sell pursuant to the Purchase Agreement. If and when we do sell Purchase Shares to Mast Hill, after Mast Hill Mast Hill acquired the Purchase Shares, Mast Hill may resell all, some or none of those shares at any time or from time to time in its discretion. Therefore, sales to Mast Hill by us could result in substantial dilution to the interests of other holders of our common stock.

Accordingly, our existing stockholders may experience substantial dilution as a result of the sale of shares of common stock pursuant to this prospectus. The sale of these securities in the public market, or the perception that holders of a large number of securities intend to sell their securities, could reduce the market price of our common stock. However, the number of shares of our common stock ultimately offered for resale by the Buyers under this prospectus is dependent upon the number of shares of common stock ultimately issued to the Buyers.

We cannot predict if and when the Selling Stockholder may sell such shares of the common stock in the public markets.

In addition, the purchase price for the Purchase Shares under the Purchase Agreement may be below the current and/or then trading prices of shares of our common stock or below the price at which our existing shareholders

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purchased our common stock. The Selling Stockholders may potentially make a significant profit with the resale of the securities depending on the trading price of our securities at the time of a sale and the purchase price of such securities by them. While the Selling Stockholders may experience a positive rate of return based on the trading price of our securities, the existing holders of our common stock may not experience a similar rate of return on the shares of common stock they purchased due to differences in the applicable purchase price and trading price.

Additionally, the sale of a substantial number of shares of our common stock by the Selling Stockholder, or the anticipation of such sales, could make it more difficult for us to sell equity or equity-related securities in the future at a time and at a price that we might otherwise wish to effect sales.

The terms of the Purchase Agreement limit the amount of shares of common stock we may issue to Mast Hill, which may have an adverse effect on our liquidity.

The Purchase Agreement includes restrictions on our ability to sell Purchase Shares to Mast Hill, including, subject to specified limitations, if a sale would cause Mast Hill and its affiliates to beneficially own more than 4.99% of our issued and outstanding common stock. Accordingly, we cannot guarantee that we will be able to sell all \$25,000,000 shares of common stock under the Purchase Agreement. If we cannot sell the full amount of the shares that Mast Hill has committed to purchase because of these limitations, we may be required to utilize more costly and time-consuming means of accessing the capital markets, which could materially adversely affect our liquidity and cash position.

We may issue additional equity or equity-linked securities in the future, which may result in additional dilution to you.

We expect that significant additional capital will be needed in the future to continue our planned operations. To the extent that we raise additional capital by issuing equity securities, including securities exercisable for or convertible into shares of our common stock, our existing shareholders' ownership may experience substantial dilution, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common shareholder.

Although our common stock is listed on the Nasdaq Capital Market, our shares are likely to be thinly traded for some time and an active market may never develop.

Although our common stock is listed on the Nasdaq Capital Market, it is likely that initially there will be a very limited trading market for our common stock, and we cannot ensure that a robust trading market will ever develop or be sustained. Our shares of common stock may be thinly traded, and the price, if traded, may not reflect our actual or perceived value. There can be no assurance that there will be an active market for our shares of common stock in the future. The market liquidity will be dependent on the perception of our operating business, competitive forces, state of the live stream and gaming industry, growth rate and becoming cash flow profitable on a sustainable basis, among other things. We may, in the future, take certain steps, including utilizing investor awareness campaigns, press releases, road shows, and conferences to increase awareness of our business and any steps that we might take to bring us to the awareness of investors may require we compensate financial public relations firms with cash and/or stock. There can be no assurance that there will be any awareness generated or the results of any efforts will result in any impact on our trading volume. Consequently, investors may not be able to liquidate their investment or liquidate it at a price that reflects the value of the business and trading may be at an inflated price relative to the performance of our company due to, among other things, availability of sellers of our shares. If a market should develop, the price may be highly volatile. Because there may be a low price for our shares of common stock, many brokerage firms or clearing firms may not be willing to effect transactions in the securities or accept our shares for deposit in an account. Even if an investor finds a broker willing to effect a transaction in the shares of our common stock, the combination of brokerage commissions, transfer fees, taxes, if any, and any other selling costs may exceed the selling price. Further, many lending institutions will not permit the use of low-priced shares of common stock as collateral for any loans.

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We received a notice from Nasdaq that our common stock may be delisted from trading on the Nasdaq Capital Market if we fail to comply with the continued listing requirements, including the minimum bid price requirement. A delisting of our common stock is likely to reduce the liquidity of our common stock and may inhibit or preclude our ability to raise additional financing.

We are required to comply with certain Nasdaq continued listing requirements, including a minimum bid price for our common stock, as well as a series of financial tests relating to stockholder equity, market value of listed securities and number of market makers and stockholders. If we fail to maintain compliance with any of those requirements, our common stock could be delisted from Nasdaq.

Our decreasing cash reserves has resulted in our shareholder equity falling below \$2,500,000 as required by Nasdaq Listing Rule 5550(b)(1), which resulted in our receipt of a delisting notice from Nasdaq in April of 2025. In our 2024 Annual Report, we reported stockholders' equity of \$2,063,000. While we have reestablished compliance with the listing rule based on our Quarterly Report on Form 10-Q for the period ended June 30, 2025, evidencing stockholders' equity of \$3.66 million, we remain at risk of future non-compliance if our cash reserves continue to decline or if we face unexpected financial challenges, which could lead to further delisting actions by Nasdaq.

If our common stock is delisted by Nasdaq, it could lead to a number of negative implications, including an adverse effect on the price of our common stock, deterring broker-dealers from making a market in or otherwise seeking or generating interest in our common stock, increased volatility in our common stock, reduced liquidity in our common stock, the loss of federal preemption of state securities laws and greater difficulty in obtaining financing. Delisting could also cause a loss of confidence of our customers, collaborators, vendors, suppliers and employee, which could harm our business and future prospects.

If our common stock is delisted by Nasdaq, the price of our common stock may decline, and although our common stock may be eligible to trade on the OTC Bulletin Board, another over-the-counter quotation system, or on the pink sheets, an investor may find it more difficult to dispose of their common stock or obtain accurate quotations as to the market value of our common stock. If our common stock is delisted from Nasdaq, trading in our securities may be subject to the SEC's "penny stock" rules. These "penny stock" rules will require brokers trading in our common stock to adhere to more stringent rules and possibly result in a reduced level of trading activity in the secondary trading market for our common stock. The additional burdens imposed upon broker-dealers by these requirements may discourage broker-dealers from recommending transactions in our securities, which could severely limit the liquidity of our securities and consequently adversely affect the market price for our securities. Furthermore, if our common stock is delisted, we would expect it to have an adverse impact on our ability to consummate certain strategic alternatives.

Further, if our common stock is delisted, we would incur additional costs under state blue sky laws in connection with any sales of our securities. These requirements could severely limit the market liquidity of our common stock and the ability of our stockholders to sell our common stock in the secondary market.

CAUTIONARY NOTES REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein contain forward-looking statements that involve substantial risks and uncertainties. The forward-looking statements are contained principally in the sections of this prospectus entitled “*Prospectus Summary*” and “*Risk Factors*,” as well as in those sections of our 2024 Annual Report and Quarterly Reports on Form 10-Q entitled “*Business*,” “*Risk Factors*,” and “*Management’s Discussion and Analysis of Financial Condition and Results of Operations*,” as applicable, but are also contained elsewhere in this prospectus. In some cases, you can identify forward-looking statements by the words “anticipate,” “believe,” “continue,” “could,” “estimate,” “expect,” “intend,” “may,” “might,” “objective,” “ongoing,” “plan,” “predict,” “project,” “potential,” “should,” “will,” or “would,” or the negative of these terms, or other comparable terminology intended to identify statements about the future. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from the information expressed or implied by these forward-looking statements. Although we believe that we have a reasonable basis for making each forward-looking statement contained in this prospectus, we caution you that these statements are based on a combination of facts and factors currently known by us and our expectations of the future, about which we cannot be certain. Forward-looking statements are subject to considerable risks and uncertainties, as well as other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from the information expressed or implied by these forward-looking statements, including:

- our ability to successfully implement our strategic reprioritization or realize any or all of the anticipated benefits once implemented;
- our ability to raise substantial additional capital to continue as a going concern and fund our planned operations in the near term and our strategic reprioritization in the longer term;
- our ability to successfully consummate any strategic transactions, including, but not limited to, an acquisition, merger, reverse merger, sale of assets, strategic partnerships, capital raises or other transactions;
- estimates regarding our expenses, use of cash, cash runway, timing of future cash needs and anticipated capital requirements;
- our ability to license additional intellectual property to support our strategic reprioritization or out-license our intellectual property and to comply with our existing license agreements;
- our ability to enter into partnerships or strategic collaboration agreements and our ability to achieve the results and potential benefits contemplated from relationships with collaborators;
- our ability to maintain collaborations and licenses;
- our expectation of developments and projections relating to competition from other pharmaceutical and biotechnology companies or our industry;
- our plans relating to conducting future *in vitro* testing, *in vivo* efficacy studies, and non-clinical and investigational new drug or IND-enabling activities;
- the anticipated amount, timing and accounting of contract liabilities, milestones and other payments under licensing, collaboration or acquisition agreements, research and development costs and other expenses;
- our ability to remain listed on the Nasdaq Capital Market;
- our intellectual property position, including the strength and enforceability of our intellectual property rights;
- other risks and uncertainties, including those described within the section entitled “*Risk Factors*” in our 2024 Annual Report and 2025 Quarterly Reports on Form 10-Q, and subsequent Quarterly Reports on Form 10-Q, which risk factors are incorporated herein by reference.

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This list of factors that may affect future performance and the accuracy of forward-looking statements is illustrative, but not exhaustive. New risk factors and uncertainties not described here or elsewhere in this prospectus, including in the section entitled “*Risk Factors*,” may emerge from time to time. Moreover, because we operate in a competitive and rapidly changing environment, it is not possible for our management to predict all risk factors and uncertainties, 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. The forward-looking statements are also subject to the risks and uncertainties specific to our Company, including but not limited to the fact that we have only a limited operating history as a public company. In light of these risks, uncertainties and assumptions, the future events and trends 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.

You should not rely upon forward-looking statements as predictions of future events. Although we believe the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance and events and circumstances reflected in the forward-looking statements will be achieved or occur. Moreover, neither we nor any other person assume responsibility for the accuracy and completeness of the forward-looking statements. Except as required by applicable law, including the securities laws of the United States, we do not intend and do not undertake an obligation to update any of the forward-looking statements to conform these statements to actual results.

You should read this prospectus, the accompanying prospectus and the documents incorporated herein or therein and those documents filed as exhibits to the registration statement, of which this prospectus is a part, with the understanding that our actual future results, levels of activity, performance and achievements may be materially different from what we expect.

THE EQUITY FINANCING

Description of the Purchase Agreement

On May 19, 2025, we entered into the Purchase Agreement and the Registration Rights Agreement with Mast Hill pursuant to which we have the right, but not the obligation, to sell to Mast Hill up to \$25,000,000 of shares of common stock (the “Total Commitment” and shares of common stock sold pursuant to the Purchase Agreement, the “Purchase Shares”), subject to certain limitations and conditions set forth therein.

This prospectus covers the resale by Mast Hill of up to \$594,816 of our common stock (up to 247,840 shares), all of which are shares of common stock that we may sell to Mast Hill under the Purchase Agreement from time to time over the 24-month period from and after the date of the Purchase Agreement.

The following is a description of the material terms of the issuance and sale of securities pursuant to the Purchase Agreement. It does not purport to be complete. This summary is subject to and is qualified by reference to all the provisions of the Purchase Agreement, the Registration Rights Agreement and the Warrant, including the definitions of certain terms used therein. We urge you to read these documents because they, and not this description, define your rights as the investor thereunder. You may request copies of these agreements, and related ancillary documents, as set forth under the section titled “*Where You Can Find Additional Information.*”

As consideration for Mast Hill’s commitment to purchase shares of common stock in accordance with the Purchase Agreement, the Company has issued to Mast Hill the Warrant to purchase 79,900 shares of common stock concurrently with the execution of the Purchase Agreement. The Warrant is immediately exercisable and will expire on the fifth anniversary of the original issuance date. The Warrant has an initial exercise price per share of \$4.00. The exercise price and number of shares of common stock issuable upon exercise is subject to appropriate adjustment in the event of certain stock dividends and distributions, stock splits, stock combinations, reclassifications or similar events affecting the common stock and anti-dilution adjustments. We also agreed to reimburse Mast Hill for certain out-of-pocket expenses incurred in connection with the transactions contemplated under the Purchase Agreement (including its legal fees and expenses), in an aggregate amount of approximately \$17,500.

On June 9, 2025, the Company entered into the Warrant Amendment with Mast Hill. The Warrant Amendment (i) added a floor price equal to \$0.57 per share, with respect to certain adjustment to the exercise price of the Warrant in the event of any Dilutive Issuance (as defined in the Warrant), issuance of Variable Price (as defined in the Warrant) securities and certain other events set forth in Section 2(e) of the Warrant; (ii) removed the requirement to adjust the number of shares of common stock issuable upon exercise of the Warrant in the event of a Dilutive Issuance, a Variable Price adjustment or under Section 2(e) of the Warrant; and (iii) removed certain rights of the Warrant holder in connection with fundamental transactions.

Purchase and Sale of Common Stock

Upon the initial satisfaction of the conditions to our right to commence sales of Purchase Shares to Mast Hill set forth in the Purchase Agreement (such event, the “Commencement”), we will have the right, but not the obligation, from time to time at our sole discretion over the 24-month period from and after the date of the Purchase Agreement (the “Commencement Date”), subject to earlier termination as set forth in the Purchase Agreement, to direct Mast Hill to make purchases of Purchase Shares, as further described in the Purchase Agreement (each, a “Purchase”) by delivering a Put Notice (as such term is defined in the Purchase Agreement) on any trading day (the trading day during the Commitment Period that a Put Notice is deemed delivered is, the “Put Date”), so long as the lowest traded price of the common stock in the 10 trading days immediately preceding the Put Date exceeds \$0.01 per share. Such sales of common stock by the Company, if any, are subject to certain limitations set forth in the Purchase Agreement, including the effectiveness of a registration statement registering under the Securities Act, the resale by Mast Hill of shares of common stock that may be issued by the

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Company to Mast Hill under the Purchase Agreement and underlies upon the exercise of the Warrant. The Company has agreed to file such registration statement with the Securities and Exchange Commission within 60 days from the date of execution of the Purchase Agreement and the Registration Rights Agreement.

The purchase price of the Purchase Shares that we elect to sell to Mast Hill pursuant to a Purchase (the “Purchase Price”) will be the lesser of (i) 97% of the lowest VWAP of the Company’s common stock, as listed on Nasdaq, on any trading day during the Valuation Period (such price, the “Market Price”), or (ii) 102% of the lowest traded price of the Company’s common stock, as listed on Nasdaq, on any trading day during the Valuation Period (such price, the “Market Alternative Price”), on such date on which the Purchase Price is calculated in accordance with the terms of the Purchase Agreement. The Company may at its option specify a minimum share price with respect to the common stock (the “Minimum Price”) in such Put Notice. If a Minimum Price is specified by the Company in the Put Notice and the common stock trades at a price per share that is less than the Minimum Price during the respective Valuation Period (the “Minimum Price Trigger”), then the number of Purchase Shares with respect to such Purchase shall automatically be reduced to the number of Purchase Shares sold by Mast Hill prior to the first time that the common stock traded below the Minimum Price during the respective Valuation Period.

The Company may direct Mast Hill, by its delivery of a Put Notice, to purchase Purchase Shares: (i) in a minimum amount not less than \$5,000 (calculated using 97% of the VWAP of the common stock, as reported on Nasdaq, on the trading date immediately preceding the applicable Put Date (the “Initial Purchase Price”) and (ii) in a maximum amount up to the lesser of (a) \$500,000 (calculated using the Initial Purchase Price) or (b) 20% of the average trading volume of the common stock, as reported on Nasdaq, during the five trading days immediately preceding the applicable Put Date *multiplied* by the VWAP of the common stock as reported on Nasdaq on the trading date immediately preceding the applicable Put Date.

From and after Commencement, we will control the timing and amount of any sales of Purchase Shares to Mast Hill. Actual sales of Purchase Shares to Mast Hill under the Purchase Agreement will depend on a variety of factors to be determined by us from time to time, including, market conditions, the trading price of the common stock, and determinations by us as to the appropriate sources of funding for our operations. We may ultimately decide to sell to Mast Hill all, some, or none of the Purchase Shares that may be available for us to sell pursuant to the Purchase Agreement.

Beneficial Ownership Limitation

The Purchase Agreement prohibits us from directing Mast Hill to purchase any Purchase Shares if those shares, when aggregated with all other shares of our common stock then beneficially owned by Mast Hill (as calculated pursuant to Section 13(d) of the Exchange Act, and Rule 13d-3 thereunder) would result in Mast Hill beneficially owning more than 4.99% of our issued and outstanding common stock (the “Beneficial Ownership Limitation”).

Exchange Cap

Under applicable Nasdaq rules, in no event may we issue to Mast Hill under the Purchase Agreement more than 327,740 shares of our common stock (including the Warrant Shares), which number of shares equals the Exchange Cap, unless we obtain stockholder approval to issue shares of common stock in excess of the Exchange Cap or unless another exception applies such as “at market” issuances.

Proceeds

Because the purchase price per share to be paid by Mast Hill for the Purchase Shares that we may elect to sell under the Purchase Agreement, if any, will fluctuate based on the market prices of our common stock during the Valuation Period for each Purchase made, as of the date of this prospectus it is not possible for us to predict the number of shares of common stock that we will sell to Mast Hill thereunder, the actual purchase price per share to be paid by Mast Hill for such shares, or the actual gross proceeds to be raised by us from those sales, if any.

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As of October 20, 2025, there were 2,321,829 shares of our common stock issued and outstanding, which excludes both the Warrant Shares issuable to Mast Hill and the Purchase Shares we may, in our sole discretion, sell to Mast Hill from time to time from and after the date of the Purchase Agreement pursuant to the Purchase Agreement. Further, although the Purchase Agreement provides that we may issue and sell up to an aggregate of \$25,000,000 of Purchase Shares to Mast Hill, only 327,740 shares of our common stock (representing the maximum number of shares we may issue and sell under the Purchase Agreement in light of the Exchange Cap limitation) may be sold to Mast Hill and are being registered for resale under this prospectus, which includes the Warrant Shares. If all of the shares offered hereunder were issued and outstanding as of October 20, 2025, such shares would represent approximately 12.37% of the total number of shares of our common stock outstanding as of October 20, 2025.

If, after the Commencement Date, we elect to sell to Mast Hill all of the Purchase Shares (in addition to the Warrant Shares) that are available for sale by us to Mast Hill under the Purchase Agreement and that are being registered for resale under this prospectus, depending on the market prices of our common stock during the applicable Valuation Period for each Purchase made pursuant to the Purchase Agreement, the actual gross proceeds to us from the sale of all such shares may be substantially less than the \$25,000,000 Total Commitment.

If it becomes necessary for us to issue and sell to Mast Hill more shares of our common stock than are being registered for resale under this prospectus, we must first (i) obtain stockholder approval to issue shares of our common stock in excess of the Exchange Cap in accordance with applicable Nasdaq rules, and (ii) file with the SEC one or more additional registration statements to register under the Securities Act the resale by Mast Hill of any such additional shares of our common stock we wish to sell from time to time under the Purchase Agreement, which the SEC must declare effective, in each case before we may elect to sell any additional shares of our common stock to Mast Hill under the Purchase Agreement. Any issuance and sale by us under the Purchase Agreement of a substantial amount of shares of our common stock in addition to the 327,740 shares being registered for resale hereunder could cause additional substantial dilution to our stockholders. The number of shares of our common stock ultimately offered for sale by Mast Hill is dependent upon the number of Purchase Shares, if any, we ultimately sell to Mast Hill under the Purchase Agreement.

The proceeds from sales of Purchase Shares, if any, under the Purchase Agreement will depend on the frequency and prices at which we sell Purchase Shares to Mast Hill. To the extent we sell Purchase Shares under the Purchase Agreement, we plan to use any proceeds therefrom for working capital and general corporate purposes, including sales and marketing activities, product development and capital expenditures.

Conditions Precedent to Commencement and For Delivery of Purchase Notices

Our right to deliver Purchase Notices to Mast Hill under the Purchase Agreement, and Mast Hill's obligation to accept Put Notices delivered by us, are subject to (i) the initial satisfaction, at the Commencement, and (ii) the satisfaction, on the applicable Put Date for each Purchase after the Commencement Date, of the conditions precedent thereto set forth in the Purchase Agreement, which conditions include the following:

- the accuracy in all material respects of our representations and warranties included in the Purchase Agreement;
- the registration statement that includes this prospectus (and any one or more additional registration statements filed with the SEC that include shares of common stock that may be issued and sold by us to Mast Hill under the Purchase Agreement and upon exercise of the Warrant) shall continue to be effective under the Securities Act, and Mast Hill is able to utilize this prospectus to resell all of the shares of common stock included in this prospectus (and included in any such additional prospectuses);
- the SEC shall not have issued any stop order suspending the effectiveness of the registration statement that includes this prospectus (or any one or more additional registration statements filed with the SEC that include shares of common stock that may be issued and sold by us to Mast Hill under the Purchase Agreement and upon exercise of the Warrant) or prohibiting or suspending the use of this prospectus;

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- both us and Mast Hill shall have performed, satisfied and complied in all material respects with all covenants, agreements and conditions required by the Purchase Agreement to be performed, satisfied or complied with by such party;
- trading in our common stock shall not have been suspended by the SEC, Nasdaq, or the Financial Industry Regulatory Authority (“FINRA”), or otherwise halted for any reason, and our common stock shall have been approved for listing on and shall not have been delisted from Nasdaq;
- there shall be the absence of any statute, rule, regulation, executive order, decree, ruling or injunction by any court or governmental authority of competent jurisdiction that prohibits or directly and materially adversely affects the transactions contemplated by the Purchase Agreement, the Registration Rights Agreement or the Warrant (collectively, the “*Transaction Documents*”), and no proceeding shall have been commenced that may have the effect of prohibiting or materially adversely affecting any of the transactions contemplated by the Transaction Documents;
- since the date of filing of the Company’s most recent filing required under the Securities Act and the Exchange Act, no event that had or is reasonably likely to have a material adverse effect has occurred;
- the number of Purchase Shares that Mast Hill is obligated to purchase under the Purchase Agreement, when aggregated with all other shares of common stock then owned by Mast Hill beneficially or deemed beneficially owned by Mast Hill, shall not exceed the Beneficial Ownership Limitation;
- the Company shall not effect any sales of the Purchase Shares under the under the Purchase Agreement to the extent that such issuance would exceed the Exchange Cap, unless the Company first obtains stockholder approval to issue shares of common stock in excess of the Exchange Cap in accordance with applicable Nasdaq listing rules;
- the Company shall have no knowledge of any event more likely than not to have the effect of causing the registration statement that includes this prospectus (or any one or more additional registration statements filed with the SEC that include shares of common stock that may be issued and sold by us to Mast Hill under the Purchase Agreement and upon exercise of the Warrant) to be suspended or otherwise ineffective;
- the issuance of the Purchase Shares shall not violate the shareholder approval requirements of Nasdaq;
- on the date of delivery of each Put Notice, Mast Hill shall have received the closing certificate executed by an executive officer of the Company and to the effect that all the conditions to such closing shall have been satisfied as of the date of each such certificate;
- the common stock must be DWAC eligible and not subject to a “DTC chill”;
- all reports, schedules, registrations, forms, statements, information and other documents required to have been filed by the Company with the SEC pursuant to the reporting requirements of the Exchange Act shall have been filed with the SEC within the applicable time periods prescribed for such filings under the Exchange Act;
- the Company shall have reserved the minimum number of shares of common stock required to be reserved for the Mast Hill’s benefit pursuant to the Purchase Agreement;
- the lowest traded price of the common stock in the 10 trading days immediately preceding the respective Put Date must exceed \$0.01 per share; and
- Bankruptcy, insolvency, reorganization or liquidation proceedings or other proceedings, voluntary or involuntary, for relief under any bankruptcy law or any law for the relief of debtors shall not be instituted by or against the Company or any subsidiary of the Company, and the Company shall have no knowledge of any event more likely than not to have the effect of causing such bankruptcy proceedings to arise.

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Covenants

The Purchase Agreement contains customary representations, warranties, covenants and indemnification obligations of the parties. The representations, warranties and covenants contained in the Purchase Agreement were made only for purposes of such agreement and as of specific dates, were solely for the benefit of the parties to such agreement, and may be subject to limitations agreed upon by the contracting parties.

Restrictions

There are no restrictions on future financings, rights of first refusal, participation rights, penalties or liquidated damages in the Purchase Agreement, other than a prohibition on entering into certain “Equity Line of Credit” or “Variable Rate Transactions,” as defined in the Purchase Agreement. Mast Hill has agreed not to cause, or engage in any manner whatsoever in, any direct or indirect short selling of our common stock during the term of the Purchase Agreement.

Termination

The Purchase Agreement will automatically terminate upon the earliest of (i) the expiration of the 24-month period following the Commencement Date, (ii) Mast Hill’s purchase of the Purchase Shares equal to Total Commitment, or (iii) the occurrence of certain other events set forth in the Purchase Agreement.

We have the right to terminate the Purchase Agreement at any time after Commencement, at no cost or penalty, upon prior written notice to Mast Hill, provided that Mast Hill no longer holds any Purchase Shares and such notice is not delivered during a Valuation Period.

Existing Stockholders; Dilution

All shares of common stock registered in this offering which have been or may be issued or sold by us to Mast Hill under the Purchase Agreement are expected to be freely tradable. It is anticipated that shares of common stock registered in this offering may be issued and sold by us to Mast Hill from time to time at our discretion over a period of up to 24 months commencing on the Commencement Date. The issuance of shares of our common stock to Mast Hill pursuant to the Purchase Agreement will not affect the rights or privileges of our existing common stockholders, except that the economic and voting interests of each of our existing common stockholders will be diluted. Although the number of shares of our common stock that our existing stockholders own will not decrease, the shares of our common stock owned by our existing stockholders will represent a smaller percentage of our total outstanding shares of common stock after any such issuance. There are substantial risks to our stockholders as a result of the sale and issuance of common stock to Mast Hill under the Purchase Agreement. For additional information, refer to the sections of this prospectus titled “*Risk Factors*” and “*Dilution*.”

Effect of Performance of the Purchase Agreement on Our Stockholders

All 327,740 shares of common stock registered in this offering which have been or may be issued or sold by us to Mast Hill under the Purchase Agreement are expected to be freely tradable. It is anticipated that Common Shares registered in this offering will be sold over a period starting on the date that the registration statement of which this prospectus is a part is declared effective and ending on the first day of the month immediately following the 24 month anniversary of the execution date of the Purchase Agreement.

The sale by Mast Hill of a significant amount of Common Shares registered in this offering at any given time could cause the market price of Common Shares to decline and to be highly volatile. Sales of common stock to Mast Hill, if any, will depend upon market conditions and other factors to be determined by us. We may ultimately decide to sell to Mast Hill all, some or none of the additional Common Shares that may be available for us to sell pursuant to the Purchase Agreement.

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If and when we do sell shares to Mast Hill, after Mast Hill has acquired the Common Shares, Mast Hill may resell all, some or none of those Common Shares at any time or from time to time in its discretion. Therefore, sales to Mast Hill by us under the Purchase Agreement may result in substantial dilution to the interests of other holders of Common Shares. In addition, if we sell a substantial number of Common Shares to Mast Hill under the Purchase Agreement, or if investors expect that we will do so, the actual sales of Common Shares or the mere existence of our arrangement with Mast Hill may make it more difficult for us to sell equity or equity-related securities in the future at a time and at a price that we might otherwise wish to effect such sales. However, we have the right to control the timing and amount of any additional sales of Common Shares to Mast Hill and the Purchase Agreement may be terminated by us at any time at our discretion without any cost to us.

USE OF PROCEEDS

We will not receive any of the proceeds from the sale of shares of our common stock offered by the Selling Stockholder. However, we may receive up to an aggregate of \$25 million in proceeds from the sale of our common stock to the Selling Stockholder pursuant to the Purchase Agreement and up to \$319,600 in proceeds if the Selling Stockholder exercises the Common Stock Purchase Warrant at \$4.00 per share. However, the actual proceeds may be less than this amount depending on the number of shares of our common stock sold and the price at which the shares of our common stock are sold.

We intend to use any net proceeds that we receive under the Purchase Agreement for working capital and other general corporate purposes, including sales and marketing activities, product development and capital expenditures.

We may also use a portion of the net proceeds from this offering to in-license, acquire or invest in complementary businesses, technologies, products or assets. Although we currently have no agreements, commitments or obligations to do so, we evaluate such opportunities and engage in related discussions with third parties from time to time.

Our expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the net proceeds to be received upon the completion of this offering or the amounts that we will actually spend on the uses set forth above. The amounts and timing of our actual expenditures and the extent of our preclinical, clinical and future development activities may vary significantly depending on numerous factors, including the progress of our development efforts, the status of and results from our planned clinical trials, our ability to take advantage of expedited programs or to obtain regulatory approval for product candidates, the timing and costs associated with the manufacture and supply of product candidates for clinical development or commercialization and any unforeseen cash needs. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering.

Pending the uses described above, we plan to invest the net proceeds from this offering in short-term, interest-bearing obligations, investment-grade instruments or other securities.

MARKET INFORMATION

Our common stock is listed on The Nasdaq Capital Market (“Nasdaq”) under the symbol “TCRT.”

As of October 20, 2025, we had approximately 130 holders of record of our common stock, one of which was Cede & Co., a nominee for Depository Trust Company, or DTC. Shares of common stock that are held by financial institutions as nominees for beneficial owners or in “street name” are deposited into participant accounts at DTC and are considered to be held of record by Cede & Co. as one stockholder.

DIVIDEND POLICY

We do not expect to pay any cash dividends to our stockholders in the foreseeable future. Payment of future cash dividends, if any, will be at the discretion of our board of directors and will depend on a number of factors, including our results of operations, financial condition, future prospects, contractual restrictions, restrictions imposed by applicable law, and other factors our board of directors deems relevant.

DILUTION

The sale of our common stock to the Selling Stockholder pursuant to the Purchase Agreement will have a dilutive impact on our stockholders. In addition, the lower our stock price is at the time we exercise our right to sell shares to the Selling Stockholder, the more shares of our common stock we will have to issue to the Selling Stockholder pursuant to the Purchase Agreement, and our existing stockholders would experience greater dilution.

After giving effect to (i) the sale of up to 247,840 shares of our common stock to the Selling Stockholder pursuant to the Purchase Agreement at an assumed sale price of \$3.07 per share of our common stock and (ii) the issuance of an additional 79,900 shares of our common stock upon the exercise of warrants at \$4.00 per share, and after deducting estimated offering expenses payable by us, our as-adjusted net tangible book value as of June 30, 2025 would have been approximately \$4.7 million, or \$1.79 per share. This represents an immediate increase in net tangible book value of \$0.21 per share to existing stockholders and an immediate dilution of \$1.28 per share to new investors. The table below illustrates this per share dilution:

Assumed offering price per share	\$3.07
Historical net tangible book value per share as of June 30, 2025	\$1.58
Increase per share attributable to this offering	<u>\$0.21</u>
As adjusted net tangible book value per share after this offering	<u>\$1.79</u>
Dilution per share to new investors	<u>\$1.28</u>

The number of shares of our common stock to be outstanding immediately after this offering in the table above is based on 2,321,829 shares of our common stock outstanding as of June 30, 2025, and excludes:

- 136,327 shares of Common Stock issuable upon the exercise of outstanding warrants to purchase our Common Stock, with a weighted average exercise price of \$7.52 per share;
- 55,455 shares of Common Stock issuable upon exercise of outstanding stock options under our equity incentive plan, with a weighted average exercise price of \$92.21 per share;
- 217,390 shares of Common Stock issuable upon the conversion of the Company's Series A-1 Convertible Preferred Stock;
- 227,170 shares of Common Stock issuable upon the conversion of the Company's Series A-2 Convertible Preferred Stock.

Unless otherwise indicated, all information in this prospectus assumes no exercise of the outstanding Series A-1 and Series A-2 Convertible Preferred Stock, stock options or warrants described above.

SELLING STOCKHOLDER

This prospectus relates to the possible resale from time to time by Mast Hill of any or all of the shares of our common stock that have been or may be issued or sold by us to Mast Hill under the Purchase Agreement and an additional 79,900 shares of our common stock, upon the exercise of the Warrant. All such shares of common stock that are being registered under the Securities Act for resale by the Selling Stockholder in this offering are expected to be freely tradable. The resale by the Selling Stockholder of a significant number of shares of our common stock that are registered for resale in this offering at any given time, or the perception that these sales may occur, could cause the market price of our common stock to decline and to be highly volatile. We are filing the registration statement of which this prospectus forms a part to satisfy the registration rights granted to Mast Hill pursuant to the provisions of the Registration Rights Agreement.

Sales of Purchase Shares, if any, to Mast Hill under the Purchase Agreement will depend upon market conditions, the trading price of the common stock, determinations by us as to the appropriate sources of funding for our operations, and other factors to be determined by us. We may ultimately decide to sell Mast Hill all, some, or none of the Purchase Shares that may be available for us to sell to Mast Hill pursuant to the Purchase Agreement. If and when we do elect to sell Purchase Shares to Mast Hill, Mast Hill may resell all, some, or none of those shares at any time or from time to time in its discretion, and such resales may be at different prices. As a result, investors who purchase shares of our common stock from Mast Hill in this offering at different times will likely pay different prices for those shares, and so may experience different levels of dilution and different outcomes in their investment results. Investors may experience a decline in the value of the shares of our common stock they purchase from Mast Hill as a result of future sales made by us to Mast Hill at prices lower than the prices such investors paid for their shares of our common stock in this offering. In addition, if we sell a substantial number of Purchase Shares to Mast Hill, or if investors expect that we will do so, the actual sales of those shares, or the mere existence of our arrangement with Mast Hill, may make it more difficult for us to sell equity or equity-related securities in the future at a time and at a price that we might otherwise wish to effect such sales.

Although the Purchase Agreement provides that we may sell up to an aggregate of \$25,000,000 of Purchase Shares to Mast Hill, only 327,740 shares of our common stock (representing the maximum number of shares we may issue and sell under the Exchange Cap limitation) are being registered for resale under this prospectus, which includes the 79,900 Warrant Shares. If, after the Commencement Date, we elect to issue and sell to Mast Hill all shares of common stock being registered for resale under this prospectus, the actual gross proceeds from the sale of all such shares may be substantially less than the \$25,000,000 available to us under the Purchase Agreement, depending on the market prices of our common stock during each applicable Valuation Period. If it becomes necessary for us to issue and sell to Mast Hill more shares than are being registered for resale under this prospectus in order to receive aggregate gross proceeds equal to \$25,000,000, we must first obtain stockholder approval to issue shares of common stock in excess of the Exchange Cap in accordance with applicable Nasdaq rules or find an exception to the requirement. The number of shares of our common stock ultimately offered for sale by Mast Hill is dependent upon the number of Purchase Shares, if any, we ultimately sell to Mast Hill under the Purchase Agreement.

The table below presents information regarding the Selling Stockholder and the shares of common stock that it may from time to time offer for resale under this prospectus. The table is prepared based on information supplied to us by the Selling Stockholder, and reflects its holdings as of October [*], 2025. The number of shares in the column “Maximum Number of Shares of Common Stock to be Offered Pursuant to this Prospectus” represents all of the shares of common stock that the Selling Stockholders may offer for resale under this prospectus, and is comprised of the Warrant Shares upon exercise of the Warrant we have issued to Mast Hill, the additional shares of Common Stock we may sell to Mast Hill from time to time as Purchase Shares under the Purchase Agreement, subject to the Exchange Cap limitation. The Selling Stockholder may sell some, all or none of the shares it receives in this offering. We do not know how long the Selling Stockholder will hold the shares before selling them, and we currently have no agreements, arrangements or understandings with the Selling Stockholder regarding the sale of any of the shares.

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Beneficial ownership is determined in accordance with Rule 13d-3(d) promulgated by the SEC under the Exchange Act, and includes shares of our common stock with respect to which the Selling Stockholder has voting and investment power. Because the purchase price of the shares of common stock issuable under the Purchase Agreement is determined on the date of each Put Notice, the number of shares that we may actually sell under the Purchase Agreement may be fewer than the number of shares being offered by this prospectus.

Name of Selling Stockholder	Number of Shares of Common Stock Owned Prior to Offering		Maximum Number of Shares of Common Stock to be Offered Pursuant to this Prospectus (1)	Number of Shares of Common Stock Owned After Offering	
	Number	Percent		Number(2)	Percent(3)
Mast Hill Fund, L.P.	—	—%	327,740 (4)	327,740	12.37%

- (1) Represents all of the shares of common stock that the Selling Stockholder may offer for resale under this prospectus, and is comprised of the Warrant Shares upon exercise of the Warrant we have issued to Mast Hill, the additional shares of common stock we may sell to Mast Hill from time to time as Purchase Shares under the Purchase Agreement, subject to the Exchange Cap limitation. The amounts set forth in this column do not reflect the application of the Beneficial Ownership Limitation.
- (2) Assumes the issuance and sale of all shares of our common stock being offered for resale pursuant to this prospectus.
- (3) Applicable percentage ownership is based 2,321,829 shares of our common stock outstanding as of October 20, 2025;
- (4) Consists of the Warrant Shares upon exercise of the Warrant we issued to Mast Hill on May 19, 2025, as well as the maximum number of Purchase Shares we may sell to Mast Hill pursuant to the Purchase Agreement under the Exchange Cap limitation. The Purchase Agreement also prohibits us from issuing and selling any Purchase Shares to Mast Hill to the extent such shares, when aggregated with all other shares of our common stock then beneficially owned by Mast Hill, would cause Mast Hill's beneficial ownership of our common stock to exceed the Beneficial Ownership Limitation. The Purchase Agreement also prohibits us from issuing or selling more than 327,740 shares of our common stock under the Purchase Agreement, including warrants, without obtaining stockholder approval to issue additional shares in accordance with applicable rules of The Nasdaq Capital Market. The business address of Mast Hill Fund, L.P. is 150 Grossman Dr, Suite 205, Braintree, MA 02184. Lane Murphy and Patrick Hassani have voting control and investment discretion of shares held by Mast Hill Fund, LP by way of Mast Hill Management, LLC, the fund manager. As a result, Lane Murphy and Patrick Hassani may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act")) of the securities reported herein that are held by Hudson.

DESCRIPTION OF CAPITAL STOCK

The following is a summary of the material terms and provisions of our common stock and preferred stock. This summary is subject to and qualified in its entirety by our Third Amended and Restated Certificate of Incorporation, as amended, or our certificate of incorporation, our Amended and Restated Bylaws, as amended, or our bylaws, the Series A-1 Certificate of Designation and the Series A-2 Certificate of Designation, copies of which are included as exhibits to the registration statement of which this prospectus forms a part, and certain provisions of Delaware law. Prospective investors should carefully review the terms and provisions of our certificate of incorporation, our Bylaws, the Series A-1 Certificate of Designation and the Series A-2 Certificate of Designation.

General

As of the date of this prospectus, our authorized capital stock consists of 80,000,000 shares, comprised of 50,000,000 shares of common stock, par value \$0.001 per share, and 30,000,000 shares of preferred stock, par value \$0.001 per share. As of October 20, 2025, there were 2,321,829 shares of common stock, 500 shares of Series A-1 Preferred Stock and 850 shares of Series A-2 Preferred Stock issued and outstanding. Our common stock is traded on the Nasdaq Capital Market under the symbol “TCRT”.

Common Stock

Voting Rights. The holders of our common stock are entitled to one vote for each outstanding share of common stock owned by such stockholder on every matter properly submitted to the stockholders for their vote. Stockholders are not entitled to vote cumulatively for the election of directors. Because of this, the holders of a majority of the shares of common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they should so choose. At any meeting of the stockholders, a quorum as to any matter shall consist of the holders of a majority of the votes entitled to be cast on the matter, except where a larger quorum is required by law, by our certificate of incorporation or by our bylaws.

Dividend Rights. Holders of our common stock are entitled to receive ratably dividends and other distributions of cash or any other right or property as may be declared by our Board out of our assets or funds legally available for such dividends or distributions. The dividend rights of holders of common stock are subject to the dividend rights of the holders of any series of preferred stock that may be issued and outstanding from time to time.

Liquidation Rights. In the event of any voluntary or involuntary liquidation, dissolution or winding up of our affairs, holders of our common stock would be entitled to share ratably in our assets that are legally available for distribution to stockholders after payment of liabilities. If we have any preferred stock outstanding at such time, the holders of such preferred stock may be entitled to distribution and/or liquidation preferences that require us to pay the applicable distribution to the holders of preferred stock before paying distributions to the holders of common stock.

Rights and Preferences. Holders of our common stock have no preemptive, conversion or subscription rights, and there are no redemption or sinking fund provisions applicable to our common stock. The rights, preferences and privileges of the holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of our preferred stock.

The transfer agent and registrar for our common stock is Equiniti Group.

See “Certain Provisions of Delaware Law, the Certificate of Incorporation and Bylaws” for a description of provisions in our certificate of incorporation and bylaws which may have the effect of delaying, deferring or preventing changes in control.

Preferred Stock

Pursuant to our certificate of incorporation, our Board has the authority, without stockholder approval, subject to limitations prescribed by law, to provide for the issuance of up to 30,000,000 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 designation, powers, preferences and rights of the shares of each series and any qualifications, limitations or restrictions thereof, and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding. We have designated 250,000 shares of our preferred stock as our Series 1 Preferred Stock, none of which are outstanding, 1,000 shares of our preferred stock as our Series A-1 Preferred Stock, 500 shares of which are outstanding, and 1,000 shares of our preferred stock as our Series A-2 Preferred Stock, 850 shares of which are outstanding.

Our board of directors may authorize preferred shares of stock and to divide the authorized shares of our preferred stock into one or more series, each of which must be so designated as to distinguish the shares of each series of preferred stock from the shares of all other series and classes. Our board of directors is authorized, within any limitations prescribed by law and our certificate of incorporation, to fix and determine the designations, rights, qualifications, preferences, limitations and terms of the shares of any series of preferred stock including, but not limited to, the following:

- 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 any such deferral period;
- the procedures for any 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;

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- 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 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, the state of our incorporation, provide that the holders of preferred stock will have the right to vote separately as a class on any proposal involving fundamental changes in 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 designation.

Series A-1 Preferred Stock

General

On April 11, 2025, the Company entered into the Series A-1 Subscription Agreement, by and among the Company and Water Mill, pursuant to which the Company agreed to issue and sell, in a private offering to Water Mill, shares of the Series A-1 Preferred Stock, at a price per share of \$1,000 for an aggregate purchase price of \$500,000. The Preferred Offering also relates to the offering of the Series A-1 Conversion Shares issuable upon the conversion of or otherwise pursuant to the terms of the Series A-1 Preferred Stock. The Series A-1 Preferred Offering closed on April 11, 2025.

The shares of our Series A-1 Preferred Stock, when issued or paid as a dividend, and our common stock issuable upon conversion of or otherwise pursuant to the terms of the Series A-1 Preferred Stock, will be fully paid and nonassessable. The holders of the Series A-1 Preferred Stock will have no preemptive or preferential rights to purchase or subscribe for any class of our stock, obligations, warrants or other securities.

Dividends

Holders of shares of issued and outstanding Series A-1 Preferred Stock are entitled to receive, whether or not declared by our Board and whether or not there are funds legally available for the payment of dividends, cumulative dividends accrued on a daily basis in arrears at the rate of 10% per annum per share on the sum of the Series A-1 Stated Value (as defined below) thereof plus all unpaid accrued and accumulated dividends thereon; provided, that to the extent not paid on the last day of March, June, September, and December of each calendar year (each, a “Series A-1 Dividend Payment Date”), all accrued dividends on any share of Series A-1 Preferred Stock shall accumulate and compound on the applicable Series A-1 Dividend Payment Date whether or not declared by the Board and shall remain accumulated, compounding dividends until paid pursuant thereto or conversion of the Series A-1 Preferred Stock. The initial stated value per share (the “Series A-1 Stated Value”) shall be \$1,000, subject to appropriate adjustment in the event of stock splits, stock dividends, recapitalizations, or similar transaction with respect to the Series A-1 Preferred Stock. Dividends will be payable in kind through the issuance of additional shares of Series A-1 Preferred Stock.

In addition, the holders of Series A-1 Preferred Stock, to the extent any other dividends or distributions are declared for holders of the common stock, the holders of Series A-1 Preferred Stock will be entitled to participate in such dividends or distributions on an as-converted basis, subject to certain limitations set forth in the Series A-1 Certificate of Designation.

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Liquidation

Upon any liquidation, dissolution or winding-up of the Company, whether voluntary or involuntary, or certain deemed liquidation events, the holders of the Series A-1 Preferred Stock will be entitled to receive out of our assets, an amount equal to the aggregate Series A-1 Stated Value of all shares of Series A-1 Preferred Stock held by such holder, plus all unpaid accrued and accumulated dividends on all such shares of Series A-1 Preferred Stock (whether or not declared), before any distribution or payment shall be made to the holders of the common stock and any other class of securities that is specifically designated as junior to the Series A-1 Preferred Stock, and if the our assets shall be insufficient to pay in full such amounts, then the entire assets to be distributed to the holders of Series A-1 Preferred Stock shall be ratably distributed among the holders in accordance with the respective amounts that would be payable on such shares if all amounts payable thereon were paid in full.

Voting Rights

The holders of Series A-1 Preferred Stock are entitled to vote alongside holders of common stock on an as-converted basis on a 1:1 ratio as common stock, voting together as a single class, with respect to any and all matters presented to the stockholders of the Company for their action; provided, however, that, except as otherwise required by law, holders of common stock, as such, shall not be entitled to vote on any amendment to the Series A-1 Certificate of Designation. In any such vote, each holder of Series A-1 Preferred Stock shall be entitled to a number of votes equal to the number of shares of common stock into which such holder's shares of Series A-1 Preferred Stock are convertible pursuant to the Series A-1 Certificate of Designation as of the record date of such vote or written consent (or as otherwise required by applicable law).

Conversions

Subject to the provisions of the Series A-1 Certificate of Designation, the holder of Series A-1 Preferred Stock may, at its option, at any time and from time to time, convert all or any portion of outstanding shares of Series A-1 Preferred Stock then held by such holder, along with the aggregate accrued or accumulated and unpaid dividends thereon, into shares of common stock. Each share of Series A-1 Preferred Stock is convertible into such number of shares of common stock equal to (i) the sum of the Series A-1 Stated Value plus all accrued and accumulated and unpaid dividends thereon, divided by (ii) the conversion price in effect immediately prior to such conversion. The initial conversion price per share of Series A-1 Preferred Stock shall be \$2.76. The conversion price is subject to adjustment in the event of (a) payment of dividend or other distribution upon the common stock or any other capital stock of the Company payable in shares of common stock or in options or convertible securities of the Company, (b) subdivision or combination of the Company's outstanding shares of common stock, or (c) reorganization, reclassification, consolidation, or merger involving the Company.

In addition, each share of Series A-1 Preferred Stock shall automatically convert into fully paid and nonassessable shares of the common stock, at the conversion price, without any action required by the holder of the Series A-1 Preferred Stock, upon the occurrence of a Change of Control (as defined in the Series A-1 Certificate of Designation).

Limitations on Conversion

No party may convert any shares of Series A-1 Preferred Stock or otherwise issue shares on account of such shares of Series A-1 Preferred Stock if, as a result of the conversion or issuance, a holder and its affiliates would beneficially own in excess of 4.99% of the shares of our common stock. However, upon 61 days' advance notice to us, a holder may increase the limit of beneficially owned shares of our common stock from 4.99% to any amount up to 9.99% of the shares of our common stock. In the event that the issuance of shares of Common Stock to a holder upon conversion of, or otherwise on account, the shares of Series A-1 Preferred Stock results in such holder and its affiliates being deemed to beneficially own, in the aggregate, more than the maximum percentage described in the preceding sentence of the number of outstanding shares of our Common Stock (as determined

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under Section 13(d) of the Exchange Act), the number of shares so issued by which the holder's and its affiliates' aggregate beneficial ownership exceeds such maximum percentage will be deemed null and void and will be cancelled ab initio, and the holder will not have the power to vote or to transfer such excess shares.

Exchange Listing

There is no established public trading market for the Series A-1 Preferred Stock, and we do not expect a market to develop. In addition, we do not intend to list the Series A-1 Preferred Stock on any securities exchange or nationally recognized trading system. Without an active trading market, the liquidity of the Series A-1 Preferred Stock will be limited.

Series A-2 Preferred Stock

General

On June 24, 2025, the Company entered into the Series A-2 Subscription Agreement, by and among the Company and the Buyers, pursuant to which the Company agreed to issue and sell, in a private offering to the Buyers, shares of the Series A-2 Preferred Stock, at a price per share of \$1,000 for an aggregate purchase price of \$850,000. The Preferred Offering also relates to the offering of the Series A-2 Conversion Shares issuable upon the conversion of or otherwise pursuant to the terms of the Series A-2 Preferred Stock. The Series A-2 Preferred Offering closed on June 24, 2025. The shares of our Series A-2 Preferred Stock, when issued or paid as a dividend, and our common stock issuable upon conversion of or otherwise pursuant to the terms of the Series A-2 Preferred Stock, will be fully paid and nonassessable. The holders of the Series A-2 Preferred Stock will have no preemptive or preferential rights to purchase or subscribe for any class of our stock, obligations, warrants or other securities.

Dividends

Holders of shares of issued and outstanding Series A-2 Preferred Stock are entitled to receive, whether or not declared by our Board and whether or not there are funds legally available for the payment of dividends, cumulative dividends accrued on a daily basis in arrears at the rate of 10% per annum per share on the sum of the Stated Value (as defined below) thereof plus all unpaid accrued and accumulated dividends thereon; provided, that to the extent not paid on the last day of March, June, September, and December of each calendar year (each, a "Series A-2 Dividend Payment Date"), all accrued dividends on any share of Series A-2 Preferred Stock shall accumulate and compound on the applicable Series A-2 Dividend Payment Date whether or not declared by the Board and shall remain accumulated, compounding dividends until paid pursuant thereto or conversion of the Series A-2 Preferred Stock. The initial stated value per share (the "Stated Value") shall be \$1,000, subject to appropriate adjustment in the event of stock splits, stock dividends, recapitalizations, or similar transaction with respect to the Series A-2 Preferred Stock. Dividends will be payable in kind through the issuance of additional shares of Series A-2 Preferred Stock.

In addition, the holders of Series A-2 Preferred Stock, to the extent any other dividends or distributions are declared for holders of the common stock, the holders of Series A-2 Preferred Stock will be entitled to participate in such dividends or distributions on an as-converted basis, subject to certain limitations set forth in the Series A-2 Certificate of Designation.

Liquidation

Upon any liquidation, dissolution or winding-up of the Company, whether voluntary or involuntary, or certain deemed liquidation events, the holders of the Series A-2 Preferred Stock will be entitled to receive out of our assets, an amount equal to the aggregate Series A-2 Stated Value of all shares of Series A-2 Preferred Stock held by such holder, plus all unpaid accrued and accumulated dividends on all such shares of Series A-2 Preferred

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Stock (whether or not declared), before any distribution or payment shall be made to the holders of the common stock and any other class of securities that is specifically designated as junior to the Series A-2 Preferred Stock, and if the our assets shall be insufficient to pay in full such amounts, then the entire assets to be distributed to the holders of Series A-2 Preferred Stock shall be ratably distributed among the holders in accordance with the respective amounts that would be payable on such shares if all amounts payable thereon were paid in full.

Voting Rights

The holders of Series A-2 Preferred Stock are entitled to vote alongside holders of common stock on an as-converted basis on a 1:1 ratio as common stock, voting together as a single class, with respect to any and all matters presented to the stockholders of the Company for their action; provided, however, that, except as otherwise required by law, holders of common stock, as such, shall not be entitled to vote on any amendment to the Series A-2 Certificate of Designation. In any such vote, each holder of Series A-2 Preferred Stock shall be entitled to a number of votes equal to the number of shares of common stock into which such holder's shares of Series A-2 Preferred Stock are convertible pursuant to the Series A-2 Certificate of Designation as of the record date of such vote or written consent (or as otherwise required by applicable law).

Conversions

Subject to the provisions of the Series A-2 Certificate of Designation, the holder of Series A-2 Preferred Stock may, at its option, at any time and from time to time, convert all or any portion of outstanding shares of Series A-2 Preferred Stock then held by such holder, along with the aggregate accrued or accumulated and unpaid dividends thereon, into shares of common stock. Each share of Series A-2 Preferred Stock is convertible into such number of shares of common stock equal to (i) the sum of the Series A-2 Stated Value plus all accrued and accumulated and unpaid dividends thereon, divided by (ii) the conversion price in effect immediately prior to such conversion. The initial conversion price per share of Series A-2 Preferred Stock shall be \$4.49. The conversion price is subject to adjustment in the event of (a) payment of dividend or other distribution upon the common stock or any other capital stock of the Company payable in shares of common stock or in options or convertible securities of the Company, (b) subdivision or combination of the Company's outstanding shares of common stock, or (c) reorganization, reclassification, consolidation, or merger involving the Company.

In addition, each share of Series A-2 Preferred Stock shall automatically convert into fully paid and nonassessable shares of the common stock, at the conversion price, without any action required by the holder of the Series A-2 Preferred Stock, upon the occurrence of a Change of Control (as defined in the Series A-2 Certificate of Designation).

Exchange Listing

There is no established public trading market for the Series A-2 Preferred Stock, and we do not expect a market to develop. In addition, we do not intend to list the Series A-2 Preferred Stock on any securities exchange or nationally recognized trading system. Without an active trading market, the liquidity of the Series A-2 Preferred Stock will be limited.

PLAN OF DISTRIBUTION

The common stock offered by this prospectus are being offered by the Selling Stockholder. The shares may be sold or distributed from time to time by the Selling Stockholder directly to one or more purchasers or through brokers, dealers, or underwriters who may act solely as agents at market prices prevailing at the time of sale, at prices related to the prevailing market prices, at negotiated prices, or at fixed prices, which may be changed. The sale of our common stock offered by this prospectus could be effected in one or more of the following methods:

- ordinary brokers' transactions;
- transactions involving cross or block trades;
- through brokers, dealers, or underwriters who may act solely as agents;
- "at the market" into an existing market for our common stock;
- in other ways not involving market makers or established business markets, including direct sales to purchasers or sales effected through agents;
- in privately negotiated transactions; or
- any combination of the foregoing.

The Selling Stockholder may also sell shares of common stock under Rule 144 promulgated under the Securities Act, if available, rather than under this prospectus. In addition, the Selling Stockholder may transfer the shares of common stock by other means not described in this prospectus. If the Selling Stockholder effects such transactions by selling shares of common stock to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the Selling Stockholders or commissions from purchasers of the shares of common stock for whom they may act as agent or to whom they may sell as principal (which discounts, concessions or commissions as to particular underwriters, broker-dealers or agents may be in excess of those customary in the types of transactions involved). In connection with sales of the shares of common stock or otherwise, the Selling Stockholder may enter into hedging transactions with broker-dealers, which may in turn engage in short sales of the shares of common stock in the course of hedging in positions they assume. If the Company elects to waive, in whole or in part, the restrictions on short sales by the Selling Stockholder in the Purchase Agreement, the Selling Stockholders would be permitted to also sell shares of common stock short and deliver shares of common stock, as applicable, covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The Selling Stockholder may also loan or pledge shares of common stock to broker-dealers that in turn may sell such shares.

The Selling Stockholder may pledge or grant a security interest in securities 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 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 Stockholder to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The Selling Stockholder also may transfer and donate the shares of common stock 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.

Under the securities laws of some states, the shares of common stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the shares of common stock 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.

There can be no assurance that the Selling Stockholder will sell any or all of the shares of common stock registered pursuant to the registration statement, of which this prospectus forms a part.

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The Selling Stockholder, Mast Hill, is an “underwriter” within the meaning of Section 2(a)(11) of the Securities Act. As an underwriter, Mast Hill is required to comply with certain requirements of the Securities Act and the Exchange Act, including Regulation M. With certain exceptions, Regulation M precludes Mast Hill, any affiliated purchasers, and any broker-dealer or other person who participates in the distribution, from bidding for or purchasing, or attempting to induce any person to bid for or purchase, any security that is the subject of the distribution until the entire distribution is complete. Regulation M also prohibits any bids or purchases made in order to stabilize the price of a security in connection with the distribution of that security.

Except as disclosed in this prospectus, we know of no existing arrangements between Mast Hill or any other stockholder, broker, dealer, underwriter or agent relating to the sale or distribution of the shares of our common stock offered by this prospectus. Mast Hill has informed us that it intends to use one or more registered broker-dealers to effectuate all sales, if any, of our common stock that it has acquired and may in the future acquire from us pursuant to the Purchase Agreement. Each such registered broker-dealer will be an underwriter within the meaning of Section 2(a)(11) of the Securities Act. Mast Hill has informed us that each such broker-dealer will receive commissions from Mast Hill that will not exceed customary brokerage commissions. Except as disclosed in this prospectus, we know of no existing arrangements between Mast Hill or any other stockholder, broker, dealer, underwriter or agent relating to the sale or distribution of the shares of our common stock offered by this prospectus.

To the extent required by the Securities Act and the rules and regulations thereunder, any broker-dealer participating in the distribution of the shares of common stock may be deemed to be “underwriters” within the meaning of the Securities Act, and any commission paid, or any discounts or concessions allowed to, any such broker-dealer may be deemed to be underwriting commissions or discounts under the Securities Act. At the time a particular offering of the shares of common stock is made, a prospectus supplement, if required, will be distributed, which will set forth the aggregate amount of shares of common stock being offered and the terms of the offering, including the name or names of any broker-dealers or agents, any discounts, commissions and other terms constituting compensation from the selling stockholders and any discounts, commissions or concessions allowed or re-allowed or paid to broker-dealers.

The Selling Stockholders and any other person participating in distribution of the shares of common stock will be subject to applicable provisions of the Securities Exchange, 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 shares of common stock by the Selling Stockholders 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 shares of common stock to engage in market-making activities with respect to the shares of common stock. All of the foregoing may affect the marketability of the common stock and the ability of any person or entity to engage in market-making activities with respect to the shares of common stock.

LEGAL MATTERS

The validity of the issuance of our common stock offered in this prospectus will be passed upon for us by The Doney Law Firm, Las Vegas, Nevada.

EXPERTS

The financial statements of Alaunos Therapeutics, Inc. as of and for the year ended December 31, 2024, incorporated in this prospectus by reference from our Annual Report on Form 10-K as of and for the year ended December 31, 2024, have been audited, along with the adjustments described in Note 3 therein which were applied retroactively to reflect the July 2024 one-for-ten reverse stock split in the 2023 financial statements as of and for the year ended December 31, 2023, audited by Cherry Bekaert LLP, an independent registered public accounting firm, as set forth in their report thereon (which report expresses an unqualified opinion and includes an explanatory paragraph relating to the entity's ability to continue as a going concern), and have been incorporated in this prospectus and registration statement in reliance upon the report of such firm given their authority as experts in accounting and auditing.

The financial statements of Alaunos Therapeutics, Inc. as of and for the year ended December 31, 2023, incorporated in this Prospectus by reference from our Annual Report on Form 10-K for the year ended December 31, 2024, have been audited, except for the adjustments to retroactively apply the July 2024 one-for-ten reverse stock split in the 2023 financial statements, by RSM US LLP, an independent registered public accounting firm, as stated in their report thereon (which report expresses an unqualified opinion and includes an explanatory paragraph relating to the entity's ability to continue as a going concern) incorporated herein by reference, and have been incorporated in this Prospectus and Registration Statement in reliance upon such report and upon the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

Our common stock is registered with the SEC under Section 12 of the Exchange Act and, accordingly, we are subject to the information and periodic reporting requirements of the Exchange Act, and we file periodic reports, proxy statements and other information with the SEC. These periodic reports, proxy statements and other information are available at the website of the SEC at www.sec.gov.

We maintain a website at www.alaunos.com. You may access our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports, proxy statements and other information filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act with the SEC free of charge at our website as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC. We have not incorporated by reference into this prospectus or any accompanying prospectus supplement the information on our website, and you should not consider it to be a part of this prospectus or any accompanying prospectus supplement.

We have filed with the SEC a registration statement under the Securities Act, relating to the securities being offering by the Selling Stockholder. The registration statement, including the attached exhibits, contains additional relevant information about us and the securities. This prospectus does not contain all of the information set forth in the registration statement. You can obtain a copy of the registration statement for free at the website of the SEC referenced above.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to “incorporate by reference” information that we file with them. Incorporation by reference allows us to disclose important information to you by referring you to those other documents. The information incorporated by reference is an important part of this prospectus, and information that we file later with the SEC will automatically update and supersede this information. This prospectus omits certain information contained in the registration statement, as permitted by the SEC. You should refer to the registration statement, including the exhibits, for further information about us and the securities we may offer pursuant to this prospectus. Statements in this prospectus regarding the provisions of certain documents filed with, or incorporated by reference in, the registration statement are not necessarily complete and each statement is qualified in all respects by that reference. Copies of all or any part of the registration statement, including the documents incorporated by reference or the exhibits, may be obtained upon payment of the prescribed rates at the offices of the SEC listed above in “Where You Can Find More Information.” The following documents filed by us with the Commission are incorporated by reference in this prospectus:

- our Annual Report on [Form 10-K](#) for the year ended December 31, 2024, filed with the SEC on March 31, 2025, as amended on [April 30, 2025](#);
- our Quarterly Report on Form 10-Qs for the quarter ended March 31, 2025, filed with the SEC on [May 15, 2025](#), for the quarter ended June 30, 2025, filed with the SEC on [August 14, 2025](#), and for the quarter ended September 30, 2025, filed with the SEC on [November 14, 2025](#);
- our Current Reports on Form 8-K filed with the SEC on [April 11, 2025](#), [April 14, 2025](#), [April 15, 2025](#), [April 18, 2025](#), [May 23, 2025](#), [June 10, 2025](#), [June 26, 2025/June 26, 2025](#) (two reports), [July 2, 2025](#), [July 10, 2025](#), [July 17, 2025](#), and [July 22, 2025](#), to the extent the information in such reports is filed and not furnished; and
- the description of our common stock set forth in [Exhibit 4.7](#) to our Annual Report on Form 10-K for the fiscal year ended December 31, 2021, which was filed with the SEC on March 30, 2022, including any amendment or reports filed for the purposes of updating this description.

We also incorporate by reference all documents we file pursuant to Section 13(a), 13(c), 14 or 15 of the Exchange Act (other than any portions of filings that are furnished rather than filed pursuant to Items 2.02 and 7.01 of a Current Report on Form 8-K) after the date of the initial registration statement of which this prospectus is a part and prior to effectiveness of such registration statement. All documents we file in the future pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus and prior to the termination of the offering are also incorporated herein by reference and are an important part of this prospectus.

Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for the purposes of this registration statement to the extent that a statement contained herein or in any other subsequently filed document which also is or deemed to be incorporated by reference herein modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this registration statement.

We will provide upon request to each person, including any beneficial owner, to whom a prospectus is delivered, a copy of any or all of the information that has been incorporated by reference in the prospectus but not delivered with the prospectus. You may request a copy of these filings, excluding the exhibits to such filings which we have not specifically incorporated by reference in such filings, at no cost, by writing to or calling us at:

Alaunos Therapeutics, Inc.
501 E. Las Olas Blvd., Suite 300
Fort Lauderdale, FL 33301
(346) 355-4099

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You can also find these filings on our website at www.alaunos.com. We are not incorporating the information on our website other than these filings into this prospectus or any accompanying prospectus supplement.

This prospectus is part of a registration statement we filed with the SEC. You should only rely on the information or representations contained in this prospectus, in any accompanying prospectus supplement or any related free writing prospectus, or incorporated by reference herein or therein. Neither we nor the Selling Stockholders have authorized anyone to provide information other than that provided in this prospectus, any accompanying prospectus supplement or any free writing prospectus we have prepared. Neither we nor the Selling Stockholders are making an offer of the securities in any state where the offer is not permitted. You should not assume that the information in this prospectus or any prospectus supplement is accurate as of any date other than the date on the front of the document.

ALAUNOS™
THERAPEUTICS

Up to 327,740 Shares of Common Stock

Prospectus

December 11, 2025
