

AILERON THERAPEUTICS, INC.

Shares of Common Stock

Warrants to Purchase Shares of Common Stock

This free writing prospectus relates only to the offering by Aileron Therapeutics, Inc. of shares of common stock and warrants to purchase shares of common stock described below and should be read together with the base prospectus, dated June 16, 2022, included in our Registration Statement on Form S-3 (Registration No. 333-265470) filed on June 8, 2022 with the U.S. Securities and Exchange Commission, including the documents incorporated by reference therein (the “base prospectus”).

The information in this communication supersedes the information in the base prospectus to the extent inconsistent with the information in the base prospectus. Unless the context otherwise indicates, references in this prospectus to “our company,” “we,” “our” and “us” refer collectively to Aileron Therapeutics, Inc., a Delaware corporation, and its consolidated subsidiaries.

Issuer: Aileron Therapeutics, Inc.

Securities Offered: We are offering (i) shares of our common stock and (ii) warrants to purchase shares of our common stock.

Terms of Warrants Offered: The following is a summary of the material terms and provisions of the warrants to purchase shares of common stock. The warrants will be issued separately from the shares of common stock, and may be transferred separately immediately thereafter.

Term

The warrants will be immediately exercisable and may be exercised until the third anniversary of the issuance date.

Exercise Price

The exercise price and numbers of shares of common stock issuable upon exercise are subject to appropriate adjustment in the event of stock dividends, stock splits, reorganizations or similar events affecting our common stock.

Exercisability

The warrants will be exercisable, at the option of each holder, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of shares of our common stock purchased upon such exercise (except in the case of a cashless exercise as discussed below). A holder (together with its affiliates) may not exercise any portion of such holder’s warrants to the extent that the holder would own more than 4.99% of our outstanding common stock immediately after exercise, except that upon at least 61 days’ prior notice from the holder to us, the holder may increase the amount of ownership of outstanding stock after exercising the holder’s warrants up to 9.99% of the number of shares of our common stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the warrants. Purchasers in this offering may also elect prior to the issuance of warrants to have the initial exercise limitation set at 9.99% of our outstanding common stock. Further, such warrants may not be exercised to the extent that such exercise would result in a holder and its affiliates beneficially owning more than 9.99% of the outstanding common stock or outstanding voting power of the Company (including shares of common stock issuable upon exercise of the warrants held by them).

Cashless Exercise

If, at the time a holder exercises its warrants, a registration statement registering the issuance of the shares of common stock underlying the warrants under the Securities Act of 1933, as amended, or the Securities Act, is not then effective or available for the issuance of such shares, then in lieu of making the cash payment otherwise contemplated to be made to us upon such exercise in payment of the aggregate exercise price, the holder may elect instead to receive upon such exercise (either in whole or in part) the net number of shares of common stock determined according to a formula set forth in the common stock warrant.

Fundamental Transactions

In the event of any fundamental transaction, as described in the warrants and generally including any merger with or into another entity, sale of all or substantially all of our assets, tender offer or exchange offer, or reclassification of our common stock, then upon any subsequent exercise of a common stock warrant, the holder will have the right to receive as alternative consideration, for each share of our common stock that would have been issuable upon such exercise immediately prior to the occurrence of such fundamental transaction, the number of shares of common stock of the successor or acquiring corporation or of our company, if it is the surviving corporation, and any additional consideration receivable upon or as a result of such transaction by a holder of the number of shares of our common stock for which the common stock warrant is exercisable immediately prior to such event.

Call Feature

The warrants are callable by us during the ten trading day period after the date that is 30 days following the public announcement by us of the top-line results from the Phase 1b clinical trial of LTI-03 in patients with idiopathic pulmonary fibrosis, including a statement that there were no drug-related adverse events that resulted in a discontinuation of the trial (the "Trigger Date"). Subject to certain exceptions, in the event that the warrants are outstanding, if, after the Trigger Date, then we may, within ten trading days of the Trigger Date, upon notice (a "Call Notice"), call for cancellation all of the warrants for which a notice of exercise has not yet been delivered for consideration equal to \$0.001 per warrant share; provided that we may only deliver such Call Notice if the volume-weighted average price of our shares of common stock exceeds the exercise price of the warrants on the trading day immediately prior to the date we deliver the Call Notice. Any warrant subject to such Call Notice for which a notice of exercise shall not have been received by the Call Date (as hereinafter defined) will be canceled at 6:30 p.m. (New York City time) on the tenth trading day after the date we send the Call Notice (such date and time, the "Call Date").

Fractional Shares

No fractional shares of common stock will be issued upon the exercise of the warrants. Rather, the number of shares of common stock to be issued will, at our election, either be rounded up to the nearest whole number or we will pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the exercise price.

Trading Market

There is no established trading market for any of the warrants, and we do not expect a market to develop. We do not intend to apply for a listing for any of the warrants on any securities exchange or other nationally recognized trading system. Without an active trading market, the liquidity of the warrants will be limited.

Rights as a Stockholder

Except as otherwise provided in the warrants or by virtue of the holders' ownership of shares of our common stock, the holders of warrants do not have the rights or privileges of holders of our common stock, including any voting rights, until such warrant holders exercise their warrants.

Waivers and Amendments

No term of the warrants may be amended or waived without the written consent of the holder of such warrant.

Warrant Agency Agreement

Pursuant to a warrant agency agreement between us and Computershare Inc., as warrant agent, the warrants will be issued in book-entry form and shall initially be represented only by one or more global warrants deposited with the warrant agent, as custodian on behalf of The Depository Trust Company ("DTC"), and registered in the name of Cede & Co., a nominee of DTC, or as otherwise directed by DTC.

Exchange Listing:

Our common stock is listed on The Nasdaq Capital Market under the symbol "ALRN." There is no established public trading market for the warrants, and we do not expect a market to develop. We do not intend to list the warrants on The Nasdaq Capital Market or any other national securities exchange or nationally recognized trading system.

Data from Phase 1b Clinical Trial of LTI-03

On May 1, 2024, we announced positive data from cohort 1 of our ongoing Phase 1b clinical trial evaluating the safety and tolerability of inhaled LTI-03 in patients diagnosed with idiopathic pulmonary fibrosis, or IPF.

The Phase 1b trial of LTI-03 is a randomized, double-blind, placebo-controlled, Phase 1b clinical trial of LTI-03 in IPF patients, which is being conducted at 11 centers in the United States, the United Kingdom, Belgium, Germany and Australia. We plan to enroll a total of 24 patients. In the trial, these patients have a bronchoscopy at a baseline screening followed by either LTI-03 or placebo twice a day for 14 days. On day 14, shortly after the final dose, patients receive a second bronchoscopy and are monitored thereafter for seven days. In cohort 1, patients in the active arm inhaled a single 2.5 mg capsule of LTI-03 twice daily. In cohort 2, patients will receive two 2.5 mg capsules of LTI-03 for inhalation twice daily.

Of the twelve patients enrolled in cohort 1 of the trial, three were randomized to the placebo arm and nine to the active arm. In addition to the safety and tolerability of LTI-03, in the trial, various biomarkers relating to epithelial damage, fibrosis and inflammation in blood cells were assessed. The eight biomarkers that we evaluated in cohort 1 included: thymic stromal lymphopoietin (TSLP), galectin-7 (GAL-7), interleukin-11 (IL-11), collagen 1 alpha chain (Col-1 α 1), phosphorylated SMAD2/3 (pSMAD2/3/tSMAD2/3), phosphorylated AKT kinase (pAKT), soluble (sol) receptor for advanced glycation end-products (solRAGE), and CXC chemokine 7 (CXCL7).

In cohort 1, a positive trend was observed in seven out of the eight biomarkers with data from three biomarkers being statistically significant (based on a one-tailed t-test). The findings from cohort 1 include:

- LTI-03 reduced expression of multiple profibrotic proteins in both pathologic basal-like cells and fibroblasts, with statistically significant decreases observed in three biomarkers — GAL-7 (p=0.0014, SEM 0.901), TSLP (p=0.0223, SEM 5.163) and Col-1 α 1 (p=0.0489, SEM 0.7102) — supporting the potential of LTI-03 to reduce fibrosis, inflammation and associated changes in the lung.
- LTI-03 stimulated production of solRAGE (p=0.1407, SEM 0.3269), a factor indicative of type I epithelial cell health that is a critically important aspect of IPF and has gone largely unaddressed.
- LTI-03 did not induce inflammation in peripheral blood mononuclear cells as measured by pAKT (p=0.358, SEM 11.32).

LTI-03 was generally well-tolerated with no serious adverse events reported.

The Phase 1b trial is ongoing, with topline results from the high-dose cohort 2 expected in the third quarter of 2024.

**Cash and Cash
Equivalents as of March
31, 2024:**

We estimate that we had cash and cash equivalents of \$12.0 million as of March 31, 2024.

The estimated cash figure above is based on preliminary information and represents management's estimates as of the date of this free writing prospectus, is subject to completion of our financial closing procedures and does not present all necessary information for a complete understanding of our financial condition as of March 31, 2024, or our results of operations for the quarter ended March 31, 2024. Our independent registered public accounting firm has not conducted a review of, and does not express an opinion or any other form of assurance with respect to, this preliminary estimate. This preliminary financial information should not be viewed as a substitute for full quarterly financial statements prepared in accordance with United States generally accepted accounting principles and reviewed by our independent registered public accounting firms.

Use of Proceeds:

We expect to use the net proceeds from this offering, together with our existing cash and cash equivalents, to fund the development and commercialization of our product candidates, including our ongoing Phase 1b clinical trial of LTI-03; and for working capital and other general corporate purposes.

The issuer has filed a registration statement (including the base prospectus) with the U.S. Securities and Exchange Commission (the "SEC") for the offering to which this communication relates. Before you invest, you should read the base prospectus in that registration statement and other documents the issuer has filed with the SEC for more complete information about the issuer and this offering. Copies of the final prospectus supplement for this offering may be obtained, when available, for free by visiting EDGAR on the SEC website at www.sec.gov or by contacting Titan Partners Group LLC, a division of American Capital Partners, LLC, 4 World Trade Center, 29th Floor, New York, NY 10007, by phone at (929) 833-1246 or by email at prospectus@titanpartnersgrp.com.