

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549**

FORM 10-Q

(Mark One)

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended September 30, 2023

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from to

Commission File Number: 001-38942



ARCTURUS THERAPEUTICS HOLDINGS INC.

(Exact Name of Registrant as Specified in its Charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

**10628 Science Center Drive, Suite 250
San Diego, California**
(Address of principal executive offices)

32-0595345
(I.R.S. Employer
Identification No.)

92121
(Zip Code)

(858) 900-2660

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

| <u>Title of each class</u> | <u>Trading Symbol(s)</u> | <u>Name of each exchange on which registered</u> |
|---|------------------------------|--|
| Common Stock, par value \$0.001 per share | ARCT | The NASDAQ Stock Market LLC |

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

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

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

As of November 10, 2023, the registrant had 26,723,332 shares of voting common stock outstanding.

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Special Note Regarding Forward-Looking Statements

This Quarterly Report on Form 10-Q, or this quarterly report, including the section entitled “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and the documents incorporated by reference herein may contain express or implied “forward-looking statements” within the meaning of the federal securities laws, Section 27A of the Securities Act of 1933, as amended and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of various factors, including those set forth below under Part II, Item 1A, “Risk Factors” in this quarterly report. Except as required by law, we assume no obligation to update these forward-looking statements, whether as a result of new information, future events or otherwise. These statements, which represent our current expectations or beliefs concerning various future events, may contain words such as “may,” “will,” “expect,” “anticipate,” “intend,” “plan,” “believe,” “estimate” or other words indicating future results, though not all forward-looking statements necessarily contain these identifying words. Forward-looking statements in this quarterly report include, but are not limited to, statements about:

- our compliance, and ability to remain in compliance, with the stringent requirements of our current and potential government contracts, including our arrangements with the Biomedical Advanced Research and Development Authority, a division of the Office of the Assistant Secretary for Preparedness and Response within the U.S. Department of Health and Human Services and the Department of Defense;
- our compliance, and ability to remain in compliance, with the requirements of our collaboration agreements, including our collaboration with Seqirus Inc. (“CSL Seqirus”);
- the anticipated benefits and success of our collaboration agreement with CSL Seqirus related to the licensure of our STARR[®] mRNA technology and LUNAR[®] lipid-mediated delivery, including our timely receipt of upfront and potential royalty and other payments thereunder;
- the status and success of studies conducted by Meiji Holdings Co., Ltd. and their affiliates, including those related to ARCT-154;
- the status, success and benefits of our arrangements with private and governmental entities, some of which are subject to termination for convenience by our counterparties;
- the initiation, design, cost, timing, progress and results of, and our expected ability to undertake certain activities and accomplish certain goals with respect to, our research and development activities, preclinical studies and clinical trials, including those related to ARCT-154, ARCT-810 and ARCT-032;
- our ability to expand our platform technologies and discovery efforts;
- the potential safety, immunogenicity, efficacy or regulatory approval of any of our COVID-19 vaccine candidates as a booster or primary vaccination series;
- the potential effects and benefits of our technologies and product candidates on their own and in comparison to technologies, drugs or courses of treatment currently available or that may be developed by competitors;
- the likelihood that preclinical or clinical data, including with respect to ARCT-154, will be predictive of future clinical results or efficacy or safety of a product candidate;
- the anticipated timing of enrollment, duration, milestones and announcements of results of clinical trials, and the submission of applications to conduct clinical trials;
- the likelihood that clinical data will be sufficient for regulatory approval or completed in time to submit an application for regulatory approval within a particular timeframe;
- the likelihood or timing of any regulatory approval, including of the NDA filed in Japan for ARCT-154;
- the potential administration regimen or dosage, or ability to administer multiple doses of, any of our product candidates;
- our ability to obtain and maintain regulatory approval of our product candidates, and any related restrictions, limitations, and/or warnings in the label of an approved product candidate;
- our plans to research, develop and commercialize our product candidates;
- our ability to successfully commercialize, and our expectations regarding future therapeutic and commercial potential with respect to, our product candidates;
- the rate and degree of market acceptance of our product candidates;
- the success of competing therapies that are or may become available;
- the size and growth potential of the markets for our product candidates, and our ability to serve those markets and address unmet medical needs;

- our ability to obtain and maintain intellectual property protection for our product candidates;
- interactions with regulatory authorities in the United States and foreign countries;
- our ability to attract and retain experienced and seasoned scientific and management professionals;
- the performance of our third-party suppliers and manufacturers;
- our ability to advance manufacturing process and capabilities, develop scalable manufacturing processes, conduct technology transfers, and prepare for and scale-up manufacturing levels for commercialization;
- our strategic alliance partners' election to pursue development and commercialization of any programs or product candidates that are subject to our collaboration and license agreements with such partners;
- our ability to attract collaborators with relevant development, regulatory and commercialization expertise;
- future activities to be undertaken by our strategic alliance partners, collaborators and other third parties;
- the likelihood or timing of achieving milestones under our collaborations and other agreements;
- prompt and complete payment by our counterparties under our collaboration and other agreements, whether upon our achievement of milestones or otherwise;
- our ability to develop sales and marketing capabilities, whether alone or with potential future collaborators;
- our ability to avoid, settle or be victorious at costly litigation with shareholders, former executives or others, should these situations arise;
- our ability to obtain and deploy funding for our operations and to efficiently use our financial and other resources;
- our ability to continue as a going concern; and
- the accuracy of our estimates regarding future expenses, future revenues, cash flows, capital requirements need for additional financing, and possible sources of revenue.

These and other forward-looking statements are only current predictions and are subject to known and unknown risks, uncertainties, and other factors that may cause our or our industry's actual results, levels of activity, performance or achievements to be materially different from those anticipated by the forward-looking statements. In addition, historic results of scientific research, preclinical and clinical trials do not guarantee that future research or trials will suggest the same conclusions, nor that historic results referred to herein will be interpreted in the same manner due to additional research, preclinical and clinical trial results or otherwise. The forward-looking statements contained in this quarterly report are subject to risks and uncertainties, including those discussed in our other filings with the United States Securities and Exchange Commission, or the Commission. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof unless specifically stated otherwise. Although we currently believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, levels of activity, performance, or achievements.

PART I—FINANCIAL INFORMATION

Item 1. Financial Statements.

ARCTURUS THERAPEUTICS HOLDINGS INC. AND ITS SUBSIDIARIES
CONDENSED CONSOLIDATED BALANCE SHEETS

| (in thousands, except par value information) | September 30, 2023 (unaudited) | December 31, 2022 |
|--|--------------------------------------|----------------------|
| Assets | | |
| Current assets: | | |
| Cash and cash equivalents | \$ 311,918 | \$ 391,883 |
| Restricted cash | 35,000 | — |
| Accounts receivable | 38,220 | 2,764 |
| Prepaid expenses and other current assets | 8,130 | 8,686 |
| Total current assets | 393,268 | 403,333 |
| Property and equipment, net | 12,715 | 12,415 |
| Operating lease right-of-use asset, net | 29,534 | 32,545 |
| Non-current restricted cash | 22,133 | 2,094 |
| Total assets | \$ 457,650 | \$ 450,387 |
| Liabilities and stockholders' equity | | |
| Current liabilities: | | |
| Accounts payable | \$ 18,362 | \$ 7,449 |
| Accrued liabilities | 28,553 | 30,232 |
| Current portion of long-term debt | — | 60,655 |
| Deferred revenue | 40,768 | 28,648 |
| Total current liabilities | 87,683 | 126,984 |
| Deferred revenue, net of current portion | 41,911 | 20,071 |
| Long-term debt | 20,000 | — |
| Operating lease liability, net of current portion | 27,018 | 30,216 |
| Other non-current liabilities | 976 | 2,804 |
| Total liabilities | 177,588 | 180,075 |
| Stockholders' equity | | |
| Common stock, \$0.001 par value; 60,000 shares authorized; issued and outstanding shares were 26,723 at September 30, 2023 and 26,555 at December 31, 2022 | 27 | 27 |
| Additional paid-in capital | 636,194 | 608,426 |
| Accumulated deficit | (356,159) | (338,141) |
| Total stockholders' equity | 280,062 | 270,312 |
| Total liabilities and stockholders' equity | \$ 457,650 | \$ 450,387 |

The accompanying notes are an integral part of these condensed consolidated financial statements.

ARCTURUS THERAPEUTICS HOLDINGS INC. AND ITS SUBSIDIARIES
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS
(unaudited)

| (in thousands, except per share data) | Three Months Ended September 30, | | Nine Months Ended September 30, | |
|--|-------------------------------------|-------------|------------------------------------|--------------|
| | 2023 | 2022 | 2023 | 2022 |
| Revenue: | | | | |
| Collaboration revenue | \$ 43,376 | \$ 13,369 | \$ 132,670 | \$ 45,706 |
| Grant revenue | 1,764 | — | 3,274 | — |
| Total revenue | 45,140 | 13,369 | 135,944 | 45,706 |
| Operating expenses: | | | | |
| Research and development, net | 51,077 | 37,688 | 155,513 | 120,770 |
| General and administrative | 13,377 | 12,488 | 40,364 | 34,211 |
| Total operating expenses | 64,454 | 50,176 | 195,877 | 154,981 |
| Loss from operations | (19,314) | (36,807) | (59,933) | (109,275) |
| Loss from equity-method investment | — | — | — | (515) |
| Gain (loss) from foreign currency | 4 | 1,862 | (175) | 3,237 |
| Gain on debt extinguishment | — | — | 33,953 | — |
| Finance income (expense), net | 3,981 | (321) | 9,710 | (1,445) |
| Net loss before income taxes | (15,329) | (35,266) | (16,445) | (107,998) |
| Provision for income taxes | 893 | — | 1,573 | — |
| Net loss | \$ (16,222) | \$ (35,266) | \$ (18,018) | \$ (107,998) |
| Net loss per share, basic and diluted | \$ (0.61) | \$ (1.33) | \$ (0.68) | \$ (4.09) |
| Weighted-average shares outstanding, basic and diluted | 26,574 | 26,467 | 26,559 | 26,423 |
| Comprehensive loss: | | | | |
| Net loss | \$ (16,222) | \$ (35,266) | \$ (18,018) | \$ (107,998) |
| Comprehensive loss | \$ (16,222) | \$ (35,266) | \$ (18,018) | \$ (107,998) |

The accompanying notes are an integral part of these condensed consolidated financial statements.

ARCTURUS THERAPEUTICS HOLDINGS INC. AND ITS SUBSIDIARIES
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(unaudited)

| (in thousands) | Common Stock | | Additional Paid-In Capital | Accumulated Deficit | Total Stockholders' Equity |
|---|--------------|--------|----------------------------------|------------------------|----------------------------------|
| | Shares | Amount | | | |
| BALANCE – December 31, 2022 | 26,555 | \$ 27 | \$ 608,426 | \$ (338,141) | \$ 270,312 |
| Net income | — | — | — | 50,754 | 50,754 |
| Share-based compensation expense | — | — | 8,182 | — | 8,182 |
| BALANCE – March 31, 2023 | 26,555 | \$ 27 | \$ 616,608 | \$ (287,387) | \$ 329,248 |
| Net loss | — | — | — | (52,550) | (52,550) |
| Share-based compensation expense | — | — | 8,383 | — | 8,383 |
| Issuance of common stock upon exercise of stock options | 19 | — | 94 | — | 94 |
| BALANCE – June 30, 2023 | 26,574 | \$ 27 | \$ 625,085 | \$ (339,937) | \$ 285,175 |
| Net loss | — | — | — | (16,222) | (16,222) |
| Share-based compensation expense | — | — | 9,269 | — | 9,269 |
| Issuance of common stock upon exercise of stock options | 114 | — | 1,231 | — | 1,231 |
| Issuance of common stock under equity plans | 35 | — | 609 | — | 609 |
| BALANCE – September 30, 2023 | 26,723 | \$ 27 | \$ 636,194 | \$ (356,159) | \$ 280,062 |

| (in thousands) | Common Stock | | Additional Paid-In Capital | Accumulated Deficit | Total Stockholders' Equity |
|---|--------------|--------|----------------------------------|------------------------|----------------------------------|
| | Shares | Amount | | | |
| BALANCE – December 31, 2021 | 26,372 | \$ 26 | \$ 575,675 | \$ (347,490) | \$ 228,211 |
| Net loss | — | — | — | (51,169) | (51,169) |
| Share-based compensation expense | — | — | 7,371 | — | 7,371 |
| Issuance of common stock upon exercise of stock options | 35 | — | 336 | — | 336 |
| BALANCE – March 31, 2022 | 26,407 | \$ 26 | \$ 583,382 | \$ (398,659) | \$ 184,749 |
| Net loss | — | — | — | (21,563) | (21,563) |
| Share-based compensation expense | — | — | 7,274 | — | 7,274 |
| Issuance of common stock upon exercise of stock options | 27 | — | 257 | — | 257 |
| BALANCE – June 30, 2022 | 26,434 | \$ 26 | \$ 590,913 | \$ (420,222) | \$ 170,717 |
| Net loss | — | — | — | (35,266) | (35,266) |
| Share-based compensation expense | — | — | 9,436 | — | 9,436 |
| Issuance of common stock upon exercise of stock options | 36 | — | 369 | — | 369 |
| Issuance of common stock under equity plans | 22 | — | 411 | — | 411 |
| BALANCE – September 30, 2022 | 26,492 | \$ 26 | \$ 601,129 | \$ (455,488) | \$ 145,667 |

The accompanying notes are an integral part of these condensed consolidated financial statements.

ARCTURUS THERAPEUTICS HOLDINGS INC. AND ITS SUBSIDIARIES
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(unaudited)

| (in thousands) | Nine Months Ended September 30, | |
|---|--|--------------|
| | 2023 | 2022 |
| Operating activities | | |
| Net loss | \$ (18,018) | \$ (107,998) |
| Adjustments to reconcile net loss to net cash provided by (used in) operating activities: | | |
| Depreciation and amortization | 2,142 | 976 |
| Share-based compensation expense | 25,834 | 24,081 |
| Loss from equity-method investment | — | 515 |
| Foreign currency translation loss (gain) | 90 | (2,976) |
| Gain on debt extinguishment | (33,953) | — |
| Other non-cash expenses | 502 | 5,084 |
| Changes in assets and liabilities: | | |
| Accounts receivable | (35,456) | 1,323 |
| Prepaid expense and other assets | 556 | (1,858) |
| Right-of-use assets | 3,011 | 2,290 |
| Accounts payable | 10,497 | 5,335 |
| Accrued liabilities | (3,437) | 2,015 |
| Deferred revenue | 33,960 | (53,578) |
| Lease liabilities | (3,198) | (3,475) |
| Net cash provided by (used in) operating activities | (17,470) | (128,266) |
| Investing activities | | |
| Acquisition of property and equipment | (2,026) | (3,919) |
| Net cash used in investing activities | (2,026) | (3,919) |
| Financing activities | | |
| Proceeds from debt | 20,000 | — |
| Proceeds from exercise of stock options | 1,325 | 962 |
| Proceeds from the issuance of common stock under equity plans | 609 | 411 |
| Payments on debt obligations | (27,364) | (2,000) |
| Net cash used in financing activities | (5,430) | (627) |
| Net decrease in cash, cash equivalents and restricted cash | (24,926) | (132,812) |
| Cash, cash equivalents and restricted cash at beginning of the period | 393,977 | 372,569 |
| Cash, cash equivalents and restricted cash at end of the period | \$ 369,051 | \$ 239,757 |
| | Nine Months Ended September 30, | |
| | 2023 | 2022 |
| Supplemental disclosure of cash flow information | | |
| Cash paid for interest | \$ 2,102 | \$ 585 |
| Non-cash investing activities | | |
| Right-of-use assets acquired through operating leases | \$ — | \$ 30,191 |
| Purchase of property and equipment in accounts payable and accrued expenses | \$ 416 | \$ 2,761 |

The accompanying notes are an integral part of these condensed consolidated financial statements.

ARCTURUS THERAPEUTICS HOLDINGS INC. AND ITS SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

Note 1. Description of Business, Basis of Presentation and Summary of Significant Accounting Policies

Description of Business

Arcturus Therapeutics Holdings Inc. (the "Company" or "Arcturus") is a global late-stage clinical messenger RNA medicines company focused on the development of infectious disease vaccines and opportunities within liver and respiratory rare diseases. The Company became a clinical stage company during 2020 when it announced that its Investigational New Drug ("IND") application for ornithine transcarbamylase ("OTC") deficiency and its Clinical Trial Application ("CTA") for candidate LUNAR-COV19 were approved by applicable health authorities.

Basis of Presentation

The accompanying condensed consolidated financial statements include the accounts of Arcturus and its subsidiaries and are unaudited. All intercompany accounts and transactions have been eliminated in consolidation. These condensed consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles ("GAAP") for interim financial information. Accordingly, they do not include all of the information and footnotes required by GAAP for complete financial statements. In management's opinion, the accompanying condensed consolidated financial statements reflect all adjustments, consisting of normal recurring adjustments, considered necessary for a fair presentation of the results for the interim periods presented.

Interim financial results are not necessarily indicative of results anticipated for the full year. These condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and footnotes included in the Company's Annual Report on Form 10-K for the year ended December 31, 2022.

These condensed consolidated financial statements are prepared in accordance with GAAP, which requires management to make estimates and assumptions regarding the valuation of debt instruments, the equity-method investment, share-based compensation expense, accruals for liabilities, income taxes, revenue and deferred revenue, leases, and other matters that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting periods. Although these estimates are based on management's knowledge of current events and actions the Company may undertake in the future, actual results may ultimately differ from these estimates and assumptions.

Joint Ventures, Equity Method Investments and Variable Interest Entities

Investments for which the Company exercises significant influence, but does not have control are accounted for under the equity method. Equity method investment activity is related to the Company's joint venture in ARCALIS, Inc. with Axcelead, Inc. As of September 30, 2023, the Company's ownership in ARCALIS was 45.8%. ARCALIS has received financial grants of \$165 million to date from the Japanese government, which are subject to certain terms and conditions that have not yet been met, that may increase the value of ARCALIS in the future. The Company's share of the investees' results is presented as either income or loss from equity method investees in the accompanying condensed consolidated statements of operations and comprehensive loss.

Liquidity

The Company has incurred significant operating losses since its inception. As of September 30, 2023 and December 31, 2022, the Company had an accumulated deficit of \$356.2 million and \$338.1 million, respectively.

The Company's activities since inception have consisted principally of research and development activities, general and administrative activities, and raising capital. The Company's activities are subject to significant risks and uncertainties, including failing to secure additional funding before the Company achieves sustainable revenues and profit from operations. From the Company's inception through September 30, 2023, the Company has funded its operations principally with the proceeds from the sale of capital stock, revenues earned through collaboration agreements, expense reimbursements from government contracts and proceeds from long-term debt.

At September 30, 2023, the Company's balance of cash and cash equivalents, including restricted cash and non-current restricted cash, was \$369.1 million.

Management believes that it has sufficient working capital on hand to fund operations through at least the next twelve months from the date these condensed consolidated financial statements were available to be issued. There can be no assurance that the

Company will be successful in securing additional funding, that the Company's projections of its future working capital needs will prove accurate, or that any additional funding would be sufficient to continue operations in future years.

Segment Information

In making decisions regarding resource allocation and assessing performance, the chief operating decision-maker identifies operating segments as components of an enterprise for which separate discrete financial information is available for evaluation. The Company and its chief operating decision-maker view the Company's operations and manage its business in one operating segment, which is the research and development of medical applications for the Company's nucleic acid-focused technology.

Revenue Recognition

At contract inception, the Company analyzes executed arrangements to assess whether such arrangements involve joint operating activities performed by parties that are both active participants in the activities and exposed to significant risks and rewards dependent on the commercial success of such activities and therefore within the scope of ASC Topic 808, Collaborative Arrangements (ASC 808). For collaboration arrangements within the scope of ASC 808 that contain multiple elements, the Company first determines which elements of the collaboration reflect a vendor-customer relationship and are therefore within the scope of ASC 606.

The Company determines revenue recognition for arrangements within the scope of Topic 606 by performing the following five steps: (i) identify the contract; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when, or as, the Company satisfies a performance obligation.

The terms of the Company's revenue agreements include license fees, upfront payments, milestone payments, reimbursement for research and development activities, option exercise fees, consulting and related technology transfer fees and royalties on sales of commercialized products. Arrangements that include upfront payments are recorded as deferred revenue upon receipt or when due and may require deferral of revenue recognition to a future period until the Company performs obligations under these arrangements. The event-based milestone payments represent variable consideration, and the Company uses the most likely amount method to estimate this variable consideration because the Company will either receive the milestone payment or will not, which makes the potential milestone payment a binary event. The most likely amount method requires the Company to determine the likelihood of earning the milestone payment. Given the high degree of uncertainty around achievement of these milestones, the Company determines the milestone amounts to be fully constrained and does not recognize revenue until the uncertainty associated with these payments is resolved. The Company will recognize revenue from sales-based royalty payments when or as the sales occur. The Company will re-evaluate the transaction price in each reporting period as uncertain events are resolved and other changes in circumstances occur.

A performance obligation is a promise in a contract to transfer a distinct good or service to the collaborative partner and is the unit of account in Topic 606. A contract's transaction price is allocated to each distinct performance obligation based on relative standalone selling price and recognized as revenue when, or as, the performance obligation is satisfied.

For performance obligations that are recognized over time, the Company measures the progress using an input method. The input methods used are based on the effort expended or costs incurred toward the satisfaction of the performance obligation. The Company estimates the amount of effort expended, including the time estimated it will take to complete the activities, or costs incurred in a given period, relative to the estimated total effort or costs to satisfy the performance obligation. This approach requires the Company to make estimates and use judgment. If estimates or judgments change over the course of the collaboration, a cumulative catch up of revenue is recognized in the period such changes are identified.

See "Note 2, Revenue" for specific details surrounding the Company's arrangements.

Leases

The Company determines if an arrangement is a lease at inception. Lease right-of-use assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent the Company's obligation to make lease payments arising from the lease. For operating leases with an initial term greater than 12 months, the Company recognizes operating lease right-of-use assets and operating lease liabilities based on the present value of lease payments over the lease term at the commencement date. Operating lease right-of-use assets are comprised of the lease liability plus any lease payments made and excludes lease incentives. Lease terms include options to renew or terminate the lease when the Company is reasonably certain that the renewal option will be exercised or when it is reasonably certain that the termination option will not be exercised. For the Company's operating leases, if the interest rate used to determine the present value of future lease payments is not readily determinable, the Company estimates its incremental borrowing rate as the discount rate for the lease. The Company's incremental borrowing rate is estimated to approximate the interest rate on a collateralized basis with similar terms and payments, and in similar economic environments. Lease expense for lease payments is recognized on a straight-line basis over the lease term. The Company has elected the practical expedient to not separate lease and non-lease components.

See "Note 9, Commitments and Contingencies" for specific details surrounding the Company's leases.

Research and Development Costs, Net

All research and development costs are expensed as incurred. Research and development costs consist primarily of salaries, employee benefits, costs associated with preclinical studies and clinical trials (including amounts paid to clinical research organizations and other professional services), in process research and development expenses and license agreement expenses, net of any grants and prelaunch inventory. Payments made prior to the performance of research and development services are capitalized until the services are performed.

The Company records accruals for estimated research and development costs, comprising payments for work performed by third party contractors, laboratories, participating clinical trial sites, and others. Some of these contractors bill monthly based on actual services performed, while others bill periodically based upon achieving certain contractual milestones. For the latter, the Company accrues the expenses as goods or services are used or rendered.

Clinical trial activities performed by third parties are accrued and expensed based upon estimates of the proportion of work completed over the life of the individual clinical trial and patient enrollment rates in accordance with agreements established with Clinical Research Organizations ("CROs") and clinical trial sites. Estimates are determined by reviewing contracts, vendor agreements and purchase orders, and through discussions with internal clinical personnel and external service providers as to the progress or stage of completion of trials or services and the agreed-upon fee to be paid for such services.

Pre-Launch Inventory

Prior to obtaining initial regulatory approval for an investigational product candidate, the Company expenses costs relating to production of inventory as research and development expense in its condensed consolidated statements of operations and comprehensive loss, in the period incurred. When the Company believes regulatory approval and subsequent commercialization of an investigational product candidate is probable, and the Company also expects future economic benefit from the sales of the investigational product candidate to be realized, it will then capitalize the costs of production as inventory.

Restricted Cash

The Company includes the restricted cash balance in the cash, cash equivalents and restricted cash reconciliation of operating, investing and financing activities in the condensed consolidated statements of cash flows.

The following table provides a reconciliation of cash and cash equivalents and restricted cash reported within the condensed consolidated balance sheet to the total of the same such amounts shown in the condensed consolidated statement of cash flows:

| (in thousands) | September 30, 2023 | September 30, 2022 |
|---|--------------------|--------------------|
| Cash and cash equivalents | \$ 311,918 | \$ 237,676 |
| Restricted cash | 35,000 | — |
| Non-current restricted cash | 22,133 | 2,081 |
| Total cash, cash equivalents and restricted cash shown in the statement of cash flows | <u>\$ 369,051</u> | <u>\$ 239,757</u> |

Net Loss per Share

Basic net loss per share is calculated by dividing the net loss by the weighted-average number of shares of common stock outstanding for the period, without consideration for common stock equivalents. Diluted net loss per share is calculated by dividing the net loss by the weighted-average number of shares of common stock and dilutive common stock equivalents outstanding for the period determined using the treasury-stock method.

No dividends were declared or paid during the reported periods.

Recently Issued Accounting Standards Not Yet Adopted

From time to time, new accounting pronouncements are issued by the FASB or other standard setting bodies and adopted by the Company as of the specified effective date. Unless otherwise discussed, the Company believes that the impact of recently issued standards that are not yet effective will not have a material impact on the condensed consolidated financial statements and disclosures.

Note 2. Revenue

The Company has entered into license agreements and collaborative research and development arrangements with pharmaceutical and biotechnology companies, as well as consulting, related technology transfer and product revenue agreements. Under these arrangements, the Company is entitled to receive license fees, consulting fees, product fees, technological transfer fees, upfront payments, milestone payments if and when certain research and development milestones or technology transfer milestones are achieved, royalties on approved product sales and reimbursement for research and development activities. The Company's costs of performing these services are included within research and development expenses. The Company's milestone payments are typically defined by achievement of certain preclinical, clinical, and commercial success criteria. Preclinical milestones may include in vivo proof of concept in disease animal models, lead candidate identification, and completion of IND-enabling toxicology studies. Clinical milestones may, for example, include successful enrollment of the first patient in or completion of Phase 1, 2 and 3 clinical trials, and commercial milestones are often tiered based on net or aggregate sale amounts. The Company cannot guarantee the achievement of these milestones due to risks associated with preclinical and clinical activities required for development of nucleic acid medicine-based therapeutics and vaccines.

The following table presents changes during the nine months ended September 30, 2023 in the balances of contract assets and liabilities as compared to what was disclosed in the Company's Annual Report.

| (in thousands) | December 31, 2022 | Additions | Deductions | September 30, 2023 |
|------------------------------|-------------------|------------|--------------|--------------------|
| Contract Assets: | | | | |
| Accounts receivable | \$ 2,764 | \$ 170,244 | \$ (134,788) | \$ 38,220 |
| Contract Liabilities: | | | | |
| Deferred revenue | \$ 48,719 | \$ 169,904 | \$ (135,944) | \$ 82,679 |

The following table summarizes the Company's revenues for the periods indicated.

| (in thousands) | For the Three Months Ended September 30, | | For the Nine Months Ended September 30, | |
|-------------------------------|--|-----------|---|-----------|
| | 2023 | 2022 | 2023 | 2022 |
| Collaboration Revenue: | | | | |
| CSL Seqirus | \$ 43,433 | \$ — | \$ 129,257 | \$ — |
| Vinbiocare | — | 11,237 | — | 26,815 |
| Janssen | — | 934 | 660 | 2,593 |
| Other collaboration revenue | (57) | 1,198 | 2,753 | 3,798 |
| Total collaboration revenue | \$ 43,376 | \$ 13,369 | \$ 132,670 | \$ 45,706 |
| Grant revenue: | | | | |
| BARDA | \$ 1,764 | \$ — | \$ 3,274 | \$ — |
| Total grant revenue | \$ 1,764 | \$ — | \$ 3,274 | \$ — |

The following paragraphs provide information regarding the nature and purpose of the Company's most significant collaboration and grant arrangements.

CSL Seqirus

On November 1, 2022, the Company entered into a Collaboration and License Agreement (as amended, the “CSL Collaboration Agreement”) with Seqirus, Inc., a part of CSL Limited (“CSL Seqirus”), for the global exclusive rights to research, develop, manufacture, and commercialize vaccines. Under the terms of the CSL Collaboration Agreement, the Company provides CSL Seqirus with an exclusive global license to its mRNA technology (including STARR[®]) LUNAR[®] lipid-mediated delivery, along with mRNA drug substance and drug product manufacturing process. CSL Seqirus will lead development and commercialization of vaccines under the collaboration. The collaboration plans to advance vaccines against SARS-CoV-2 (COVID-19), influenza, pandemic preparedness as well as three other respiratory infectious diseases.

The Company received a \$200.0 million upfront payment and is eligible to receive over \$1.3 billion in development milestones if all products are registered in the licensed fields, and entitled to potentially receive up to \$3.0 billion in commercial milestones based on net sales of vaccines in the various fields. In addition, the Company is eligible to receive a 40% net profit share for COVID-19 vaccine products and up to low double-digit royalties for vaccines against flu, pandemic preparedness and three other respiratory pathogens.

In March 2023, the Company achieved development milestones, including milestones associated with nominating next generation vaccine candidates, resulting in \$90.0 million received from CSL Seqirus during the second quarter of 2023. In April 2023 the Company also received an advance payment of \$23.6 million for the manufacturing and supply of ARCT-154 drug product. The advance payment was for specified manufacturing runs of ARCT-154 which include the drug substance utilized, as well as the reservation fees and related manufacturing requirements. The Company concluded that the promise to manufacture and supply ARCT-154 drug product is a customer option as part of the CSL Collaboration Agreement and is accounted for as a separate contract. The advance payment of \$23.6 million is included in deferred revenue as of September 30, 2023.

In September 2023, the Company achieved a development milestone related to the completion of the first GMP batch manufacture of drug product in a multi-dose vial for clinical studies in the SARS-CoV-2 field. The Company invoiced CSL Seqirus and added \$35.0 million to the transaction price during the three months ended September 30, 2023. The Company anticipates that it will receive this payment from CSL Seqirus during the fourth quarter of 2023.

In evaluating the CSL Collaboration Agreement in accordance with Accounting Standards Codification (“ASC”) Topic 606, the Company concluded that CSL Seqirus is a customer. The Company identified all promised goods/services within the CSL Collaboration Agreement, and when combining certain promised goods/services, the Company concluded that there are five distinct performance obligations. The nature of the performance obligations consists of delivery of the vaccine license, research and development services for COVID and non-COVID vaccines and regulatory activities for COVID vaccines. For each performance obligation, the Company estimated the standalone selling price based on 1) in the case of the license, the fair value using costs to recreate plus margin method and 2) in the case of research and development services and regulatory activities, cost plus margin for estimated full-time equivalent (“FTE”) costs, direct costs including laboratory supplies, contractors, and other out-of-pocket expenses for research and development services and regulatory activities.

As of September 30, 2023, the transaction price consisted of upfront consideration received and milestones achieved in March 2023 and September 2023. Additional variable consideration was not included in the transaction price at September 30, 2023 because the Company could not conclude that it is probable that including the variable consideration will not result in a significant revenue reversal.

The Company allocated the transaction price to the performance obligations in proportion to their standalone selling price. The vaccine license was recognized at the point in time when it was transferred and any additional consideration allocated to the license is recognized at the point that the consideration becomes probable of non-reversal as the performance obligation has been delivered. The research and development and regulatory activities performance obligations are recognized over a period of time based on the percentage of services rendered using the input method, meaning actual costs incurred divided by total costs budgeted to satisfy the performance obligation. Any consideration related to sales-based royalties will be recognized when the amounts are probable of non-reversal, provided that the reported sales are reliably measurable and the Company has no remaining promised goods/services, as they

are constrained and therefore have also been excluded from the transaction price. The revenue recognized during the quarter ended September 30, 2023 relates to the license delivered, milestones achieved and services performed.

Total deferred revenue as of September 30, 2023 and December 31, 2022 was \$82.5 million and \$45.6 million, respectively.

In August 2023, the Company entered into an amendment to the CSL Collaboration Agreement, pursuant to which the Company agreed to sponsor and conduct a Phase I clinical study in the influenza field. As part of the amendment, the Company and CSL Seqirus agreed to a \$17.5 million milestone payment which was met during the third quarter of 2023 upon the execution of a Phase I study start-up agreement. The amendment also provides for up to \$1.5 million in additional payments which are achievable upon meeting certain clinical milestones relating to the Phase I clinical study in the influenza field. The Company previously concluded that the expansion of research and development support services under the CSL Collaboration Agreement represented an option that was not a material right. Therefore the Company concluded the promise to sponsor and conduct the Phase I clinical study is a separate contract and the sole performance obligation under the new arrangement. During the third quarter of 2023, the Company recognized \$1.2 million related to the performance obligation and recorded the remaining amount of \$16.3 million to deferred revenue.

Vinbiocare

During 2021 the Company entered into certain agreements (collectively, the “Vinbiocare License & Supply Agreements”) with Vinbiocare Biotechnology Joint Stock Company (“Vinbiocare”), a member of Vingroup Joint Stock Company, whereby the Company would provide technical expertise and support services to Vinbiocare to assist in the build out of a mRNA drug product manufacturing facility in Vietnam. The Company received an upfront payment in aggregate of \$40.0 million as part of the Vinbiocare License & Supply Agreements. In October 2022, the Company and Vinbiocare executed a letter of agreement terminating the License & Supply Agreements. The Company incurred no financial penalties in connection with the termination of the License & Supply Agreements and has no further financial obligations to Vinbiocare under these terminated agreements.

In October 2022, in association with the termination of the License & Supply Agreements, the Company signed the Study Support Agreement with Vinbiocare which provides that Vinbiocare shall continue to serve as the regulatory and financial sponsor of clinical studies conducted in Vietnam of ARCT-154 pursuant to the Company’s arrangements with Vinbiocare (the “Study Support Agreement”). To support the continuing activities of these studies, the Study Support Agreement further provides for the Company to conduct certain services and to compensate Vinbiocare to help achieve the objectives of these studies. In February 2023, the Company agreed to provide additional financial support in the amount of approximately \$2.1 million to allow Vinbiocare to provide additional study support duties related to the ARCT-154 clinical study. As a result, the Company reserved \$11.8 million of the original upfront payment to be paid to Vinbiocare over the future periods pursuant to the Study Support Agreement by reclassifying a portion of the upfront payment received from Vinbiocare pursuant to the License & Supply Agreements, from deferred revenue to short-term and long-term liabilities, based on the anticipated timing of the payments to Vinbiocare, and removed that portion of the upfront payment from the transaction price of the modified arrangement. The transaction price was not adjusted for payments that are contingent upon the occurrence of future regulatory or sales-related events based on the information currently available to the Company.

The Company has concluded that it has no remaining performance obligations under its prior arrangements with Vinbiocare as summarized above as of September 30, 2023. As of September 30, 2023, the Company has accrued liabilities related to this arrangement of \$3.5 million in current liabilities and \$1.0 million in non-current liabilities that will be paid upon the occurrence of specified events through the first quarter of 2025. Vinbiocare is also eligible to receive a single digit percentage of amounts from net sales, if any, of ARCT-154 (or next-generation COVID vaccine) up to a capped amount of low single digit millions. The Company has no remaining deferred revenue as of September 30, 2023 and December 31, 2022.

BARDA Grant

In August 2022, the Company entered into a cost reimbursement contract with the Biomedical Advanced Research and Development Authority (“BARDA”), a division of the Office of the Assistant Secretary for Preparedness and Response (ASPR) within the U.S. Department of Health and Human Services (HHS) for an award of up to \$63.2 million for the development of a pandemic influenza vaccine using the Company's STARR[®] self-amplifying mRNA vaccine platform technology. The Company earns grant revenue for performing tasks under the agreement.

The Company determined that the agreement with BARDA is not in the scope of ASC 808 or ASC 606. Applying International Accounting Standards No. 20 (“IAS 20”), Accounting for Government Grants and Disclosure of Government Assistance, by analogy, the Company recognizes grant revenue from the reimbursement of direct out-of-pocket expenses, overhead allocations and fringe benefits for research costs associated with the grant. The costs associated with these reimbursements are reflected as a component of research and development expenses in the Company’s condensed consolidated statements of operations and comprehensive loss.

The Company recognized \$1.8 million and \$3.3 million of revenue during the three and nine months ended September 30, 2023, respectively. As of September 30, 2023, the remaining available funding net of revenue earned was \$59.6 million.

Note 3. Fair Value Measurements

The Company establishes the fair value of its assets and liabilities using the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The Company established a fair value hierarchy based on the inputs used to measure fair value.

The three levels of the fair value hierarchy are as follows:

Level 1: Quoted prices in active markets for identical assets or liabilities.

Level 2: Inputs, other than the quoted prices in active markets, that are observable either directly or indirectly.

Level 3: Unobservable inputs in which little or no market data exists and are therefore determined using estimates and assumptions developed by the Company, which reflect those that a market participant would use.

The carrying value of cash, restricted cash, accounts receivable, accounts payable, accrued liabilities and the Singapore Loan (as defined below) approximate their respective fair values due to their relative short maturities. Prior to payoff and forgiveness of

long-term debt in the first quarter of 2023, the carrying amounts of long-term debt for the amount drawn on the Company's debt facility approximated fair value as the interest rate was variable and reflected current market rates.

As of September 30, 2023 and December 31, 2022, all assets measured at fair value on a recurring basis consisted of cash equivalents and money market funds, which were classified within Level 1 of the fair value hierarchy. The fair value of these financial instruments was measured based on quoted prices.

Note 4. Balance Sheet Details

Property and equipment, net balances consisted of the following:

| (in thousands) | September 30, 2023 | December 31, 2022 |
|--|--------------------|-------------------|
| Research equipment | \$ 15,764 | \$ 10,251 |
| Computers and software | 1,370 | 1,154 |
| Office equipment and furniture | 958 | 958 |
| Leasehold improvements | 2,548 | 2,491 |
| Construction in progress | — | 3,344 |
| Total | 20,640 | 18,198 |
| Less accumulated depreciation and amortization | (7,925) | (5,783) |
| Property and equipment, net | <u>\$ 12,715</u> | <u>\$ 12,415</u> |

Depreciation and amortization expense was \$0.8 million and \$2.1 million for the three and nine months ended September 30, 2023, respectively, and \$0.4 million and \$1.0 million for the three and nine months ended September 30, 2022, respectively. Construction in progress at December 31, 2022 primarily includes research equipment that was placed into service during 2023.

Accrued liabilities consisted of the following:

| (in thousands) | September 30, 2023 | December 31, 2022 |
|---|--------------------|-------------------|
| Accrued compensation | \$ 10,200 | \$ 4,038 |
| Income tax payable | 482 | 1,295 |
| Current portion of operating lease liability | 4,200 | 3,884 |
| Clinical accruals | 3,180 | 4,531 |
| Contractual liabilities | 3,492 | 7,468 |
| Other accrued research and development expenses | 6,999 | 9,016 |
| Total | <u>\$ 28,553</u> | <u>\$ 30,232</u> |

Note 5. Debt

Wells Fargo Credit Agreement

On April 21, 2023, the Company's wholly-owned subsidiary, Arcturus Therapeutics, Inc. entered into a credit agreement with Wells Fargo Bank, National Association ("Wells Fargo") whereby Wells Fargo will make a \$50.0 million revolving credit line available to the Company (the "Loan") and each Loan evidenced by a revolving line of credit note (the "Note").

Borrowings under the agreement will bear interest at a rate of 1.00% above either the Daily Simple SOFR or Term SOFR (as such terms are defined in the Note), with "SOFR" being the rate per annum equal to the secured overnight financing rate as administered by the Federal Reserve Bank of New York. If an Event of Default (as defined in the agreement) occurs, then all Loans shall bear interest at a rate equal to 2.00% above the interest rate applicable immediately prior to the occurrence of the Event of Default.

The term of the agreement is two years, with an option for one-year renewals subject to Wells Fargo approval and the Company furnishing to Wells Fargo a non-refundable commitment fee equal to 0.25% of the Loan amount for each such renewal. There is no penalty for terminating the facility prior to the maturity date of the Note. As collateral, the Company has agreed to pledge \$55.0 million in cash to be held at the Company's securities accounts with Wells Fargo Securities, LLC, an affiliate of Wells Fargo, pursuant to a security agreement. In September 2023, the Company drew down \$20.0 million from the Loan.

Manufacturing Support Agreement

On November 7, 2020, the Company's wholly-owned subsidiary, Arcturus Therapeutics, Inc., entered into a Manufacturing Support Agreement (the "Support Agreement") with the Economic Development Board of the Republic of Singapore (the "EDB").

Pursuant to the Support Agreement, the EDB agreed to make a term loan (the “Singapore Loan”) of S\$62.1 million to the Company, subject to the satisfaction of customary deliveries, to support the manufacture of the LUNAR-COV19 vaccine candidate (ARCT-021). The Singapore Loan accrued interest at a rate of 4.5% per annum calculated on a daily basis. The Company elected to borrow the full amount available under the Support Agreement of S\$62.1 million (\$46.6 million) on January 29, 2021. During the first quarter of 2023, the EDB agreed to an extension of the reconciliation period to March 22, 2023, with unused funds not utilized for the manufacture of ARCT-021 as of such date returned to the EDB. As of December 31, 2022, the outstanding balance of the Singapore Loan, which includes accrued interest, was \$50.4 million of which the Company paid S\$22.8 million (\$17.1 million) in March 2023. During the first quarter of 2023, the remaining principal portion of the Singapore Loan plus accrued interest, totaling \$34.0 million, was forgiven and recorded as a gain on debt extinguishment in the condensed consolidated statement of operations and comprehensive loss.

For the three months ended September 30, 2023, the Company recorded no interest expense, compared to interest expense of \$0.5 million for the same period in 2022. For the nine months ended September 30, 2023, the Company recorded interest expense of \$0.5 million, compared to interest expense of \$1.6 million for the same period in 2022.

Termination of Agreement with Western Alliance Bank

On March 14, 2023, the Loan and Security Agreement, dated as of October 12, 2018 (as amended and supplemented, the “Western Alliance Agreement”) with Western Alliance Bank, an Arizona corporation (“Western Alliance”), was terminated (the “Termination”) upon the receipt by Western Alliance of a payoff amount of approximately \$7.4 million from the Company. The Western Alliance Agreement provided for a collateralized term loan in the aggregate principal amount of up to \$15.0 million, with interest at a floating rate ranging from 1.25% to 2.75% above the prime rate and a maturity date of October 30, 2023. The payoff amount was made by the Company to Western Alliance from available cash on hand, pursuant to a payoff letter, and included payment of (i) approximately \$7.0 million in principal and interest, (ii) \$0.3 million fee payable upon prepayment as a result of prior FDA approval of an IND and (iii) de minimis amounts in prepayment charges and various operational fees. The Company was released from all liens under the Western Alliance Agreement.

For the three months ended September 30, 2023, the Company recorded no interest expense, compared to interest expense of \$0.7 million for the same period in 2022. For the nine months ended September 30, 2023 and 2022, the Company recorded interest expense of \$0.3 million and \$2.1 million, respectively.

Note 6. Stockholders' Equity

Net Loss per Share

Potentially dilutive securities that were not included in the calculation of diluted net loss per share for the three and nine months ended September 30, 2023 as they were anti-dilutive totaled 1.2 million and 0.8 million, respectively, and 0.5 million and 0.7 million for the three and nine months ended September 30, 2022, respectively.

Note 7. Share-Based Compensation Expense

In June 2022 at the Company's 2022 Annual Meeting of Stockholders (the "2022 Annual Meeting"), the stockholders of the Company approved an amendment to the Company's 2019 Omnibus Equity Incentive Plan (as amended, the "2019 Plan") which, among other things, increased the aggregate number of shares authorized for use in making awards to eligible persons under the 2019 Plan by 3,750,000 shares, for a total of up to 8,750,000 shares available for issuance. As of September 30, 2023, a total of 1,523,452 shares remain available for future issuance under the 2019 Plan, subject to the terms of the 2019 Plan.

In October 2021, the Company adopted the 2021 Inducement Equity Incentive Plan which covers the award of up to 1,000,000 shares of common stock (the "2021 Plan") effective as of October 15, 2021. Approval of the Company's stockholders is not required as a condition to the effectiveness of the 2021 Plan for so long as the plan is in compliance with applicable Nasdaq inducement plan rules. In April 2022, the compensation committee of the Company's board of directors approved a proposal to reduce the total number of shares available for future issuance under the 2021 Plan to 130,000. As of September 30, 2023, a total of 100,725 shares remain available for future issuance under the 2021 Plan, subject to the terms of the 2021 Plan.

Stock Options

Share-based compensation expense included in the Company's condensed consolidated statements of operations and comprehensive loss for the three and nine months ended September 30, 2023 and 2022 was as follows:

| (in thousands) | For the Three Months Ended September 30, | | For the Nine Months Ended September 30, | |
|----------------------------|--|----------|---|-----------|
| | 2023 | 2022 | 2023 | 2022 |
| Research and development | \$ 3,863 | \$ 3,996 | \$ 11,112 | \$ 10,811 |
| General and administrative | 5,406 | 5,440 | 14,722 | 13,270 |
| Total | \$ 9,269 | \$ 9,436 | \$ 25,834 | \$ 24,081 |

Note 8. Income Taxes

The Company is subject to taxation in the United States and various states. The Company computes its quarterly income tax provision by using a forecasted annual effective tax rate and adjusts for any discrete items arising during the quarter. The primary difference between the effective tax rate and the federal statutory tax rate is due to federal and state income tax expense offset by valuation allowance on the Company's deferred tax assets.

For the three and nine months ended September 30, 2023, the Company recorded \$0.9 million and \$1.6 million of income tax expense, respectively. No tax benefit was provided for losses incurred in United States because those losses are offset by a full valuation allowance.

Note 9. Commitments and Contingencies

Cystic Fibrosis Foundation Agreement

On September 25, 2023, the Company amended its Development Program Letter Agreement, dated May 16, 2017 and as amended July 13, 2018 and August 1, 2019, with the Cystic Fibrosis Foundation ("CFF"). Pursuant to the amendment, (i) CFF increased the amount it will award to advance LUNAR-CF to \$24.6 million from approximately \$15.6 million, (ii) the Company agreed to incur at least \$15.0 million toward activities under the research plan. Subsequent to September 30, 2023, the Company received the full payment from CFF related to the amendment. The funds received from CFF will be recognized as contra research and development expense beginning in the three months ended September 30, 2023. Total contra expense of \$1.8 million was recognized during the three and nine months ended September 30, 2023. For the three and nine months ended September 30, 2022, the Company recognized contra expense of \$0.5 million and \$3.2 million, respectively, which related to the August 2019 amendment. As of September 30, 2023 and December 31, 2022, no amounts were included in accrued liabilities.

Leases

In October 2017, the Company entered into a non-cancellable operating lease agreement for office space adjacent to its previously occupied headquarters. The commencement of the lease began in March 2018 and the lease extends for approximately 84 months from the commencement date with a remaining lease term through March 2025. Monthly rental payments are due under the lease and there are escalating rent payments during the term of the lease. The Company is also responsible for its proportional share of operating expenses of the building and common areas. In conjunction with the new lease, the Company received free rent for four months and received a tenant improvement allowance of \$0.1 million. The lease may be extended for one five-year period at the then current market rate with annual escalations; however, the Company deemed the extension option not reasonably certain to be exercised and therefore excluded the option from the lease terms. The Company entered into an irrevocable standby letter of credit with the landlord for a security deposit of \$0.1 million upon executing the lease which is included (along with additional funds required to secure the letter of credit) in the balance of non-current restricted cash.

In February 2020, the Company entered into a second non-cancellable operating lease agreement for office space near its current headquarters. The lease extended for 13 months from the commencement date and included a right to extend the lease for one twelve-month period. In February 2021, the Company opted to extend the lease through March 2025 to coincide with the lease term of the Company's headquarters.

In September 2021, the Company entered into a third non-cancellable lease agreement for office, research and development, engineering and laboratory space near its current headquarters and lease term commenced during the second quarter of 2022. The initial term of the lease extends ten years and eight months from the date of possession, and the Company has the right to extend the term of the lease for an additional five-year period. When the lease term was determined for the operating lease right-of-use assets and lease liabilities, the extension option for the lease was not included. The lease has a monthly base rent ranging from \$0.3 million to \$0.4 million which escalates over the lease term. The Company received a free rent period of four months and also pays for various operating costs, including utilities and real property taxes. The Company entered into an irrevocable standby letter of credit with the landlord for a security deposit of \$2.0 million upon executing the lease which is included (along with additional funds required to secure the letter of credit) in the balance of non-current restricted cash.

Operating lease right-of-use asset and liability on the condensed consolidated balance sheets represent the present value of remaining lease payments over the remaining lease terms. The Company does not allocate lease payments to non-lease components; therefore, payments for common-area-maintenance and administrative services are not included in the operating lease right-of-use asset and liability. The Company uses its incremental borrowing rate to calculate the present value of the lease payments, as the implicit rate in the lease is not readily determinable.

As of September 30, 2023, the remaining payments of the operating lease liability were as follows:

| (in thousands) | Remaining Lease Payments |
|---------------------------------------|---------------------------------|
| 2023 | \$ 1,378 |
| 2024 | 5,646 |
| 2025 | 4,019 |
| 2026 | 3,603 |
| Thereafter | 23,283 |
| Total remaining lease payments | 37,929 |
| Less: imputed interest | (6,711) |
| Total operating lease liabilities | \$ 31,218 |
| Weighted-average remaining lease term | 8.3 |
| Weighted-average discount rate | 4.9% |

Operating lease costs consist of the fixed lease payments included in operating lease liability and are recorded on a straight-line basis over the lease terms. Operating lease costs were \$1.4 million and \$4.2 million for the three and nine months ended September 30, 2023, respectively, and \$1.4 million and \$3.3 million for the three and nine months ended September 30, 2022, respectively.

Note 10. Related Party Transactions

On December 13, 2022, Vallon Pharmaceuticals, Inc. (“Vallon”) entered into an agreement with GRI Bio, Inc. (“GRI Bio”) pursuant to which GRI Bio was to merge with a wholly-owned subsidiary of Vallon in an all-stock transaction. The transaction closed in April 2023 and the Company's executive resigned from the board of directors of Vallon. Following the closing of the merger, the combined company now operates under the name “GRI Bio, Inc.” and will focus on the development of GRI Bio's pipeline and trade on the Nasdaq under the ticker symbol “GRI”. Following the closing of the merger, the Company holds 28,125 shares in GRI Bio, or approximately 1%. Upon the closing of the merger, the Company determined that it did not have the ability to exercise significant influence over operating and financial policies of GRI Bio. As such, the Company discontinued equity method of accounting for its investment in GRI Bio.

See “Note 1, Joint Ventures, Equity Method Investments and Variable Interest Entities” for specific details surrounding the Company's agreement with Axcelead to form the joint venture entity, ARCALIS, Inc.

Item 2. Management’s Discussion and Analysis of Financial Condition and Results of Operations.

The following is a discussion of the financial condition and results of operations of Arcturus Therapeutics Holdings Inc. for the three and nine month periods ended September 30, 2023. Unless otherwise specified herein, references to the “Company,” “Arcturus,” “we,” “our” and “us” mean Arcturus Therapeutics Holdings Inc. and its consolidated subsidiaries. You should read the following discussion and analysis together with the interim condensed consolidated financial statements and related notes included elsewhere herein. For additional information relating to our management’s discussion and analysis of financial conditions and results of operations, please see our Annual Report on Form 10 K for the year ended December 31, 2022 (the “2022 Annual Report”), which was filed with the U.S. Securities and Exchange Commission (the “Commission”) on March 29, 2023. Unless otherwise defined herein, capitalized words and expressions used herein shall have the same meanings ascribed to them in the 2022 Annual Report.

This report includes forward-looking statements which, although based on assumptions that we consider reasonable, are subject to risks and uncertainties which could cause actual events or conditions to differ materially from those currently anticipated and expressed or implied by such forward-looking statements.

You should read this report and the documents that we reference in this report and have filed as exhibits to this report completely and with the understanding that our actual future results may be materially different from what we expect. You should also review the factors and risks we describe in the reports we will file or submit from time to time with the Commission after the date of this report.

Overview

We are a global late-stage clinical messenger RNA medicines company focused on the development of infectious disease vaccines and opportunities within liver and respiratory rare diseases. In addition to our messenger RNA (“mRNA”) platform, our proprietary lipid nanoparticle (“LNP”) delivery system, LUNAR[®], has the potential to enable multiple nucleic acid medicines, and our proprietary self-amplifying mRNA technology (Self-Transcribing and Replicating RNA, or STARR[®], technology) has the potential to provide longer-lasting RNA and sustained protein expression at lower dose levels as compared to conventional mRNA.

We are leveraging our proprietary LUNAR[®] platform and our nucleic acid technologies to develop and advance a pipeline of mRNA-based vaccines and therapeutics for infectious diseases and rare genetic disorders with significant unmet medical needs. We continue to expand this platform by adding new innovative delivery solutions that allow us to expand our discovery efforts. Our proprietary LUNAR[®] technology is intended to address the major hurdles in RNA drug development, namely the effective and safe delivery of RNA therapeutics to disease-relevant target tissues. We believe the versatility of our platform to target multiple tissues, its compatibility with various nucleic acid therapeutics, and our expertise in developing scalable manufacturing processes can allow us to deliver on the next generation of nucleic acid medicines.

Business Updates

Updates on Vaccine Program

In November 2022, we entered into a Collaboration and License Agreement (the “CSL Collaboration Agreement”) with Seqirus, Inc. (“CSL Seqirus”), a part of CSL Limited, and one of the world’s leading influenza vaccine providers, for global exclusive rights to research, develop, manufacture and commercialize self-amplifying mRNA vaccines against COVID-19, influenza and three other respiratory infectious diseases and global non-exclusive rights to pandemic pathogens. The CSL Collaboration Agreement became effective on December 8, 2022. The collaboration combines CSL Seqirus’ established global vaccine commercial and manufacturing infrastructure with Arcturus’ manufacturing expertise and innovative STARR[®] self-amplifying mRNA vaccine and LUNAR[®] delivery platform technologies. Under the framework of our collaboration with CSL Seqirus, we continue the development of the COVID-19 vaccine to establish a differentiated platform and address routine recommendations for periodic vaccine composition updates in a timely manner. On August 10, 2023, we entered into an amendment to the CSL Collaboration Agreement, pursuant to which CSL Seqirus agreed to make a \$17.5 million milestone payment related to a development milestone for the LUNAR-FLU program under the collaboration. We plan to initiate a Phase 1 clinical study with a candidate influenza vaccine during the fourth quarter of 2023 as a part of this collaboration program.

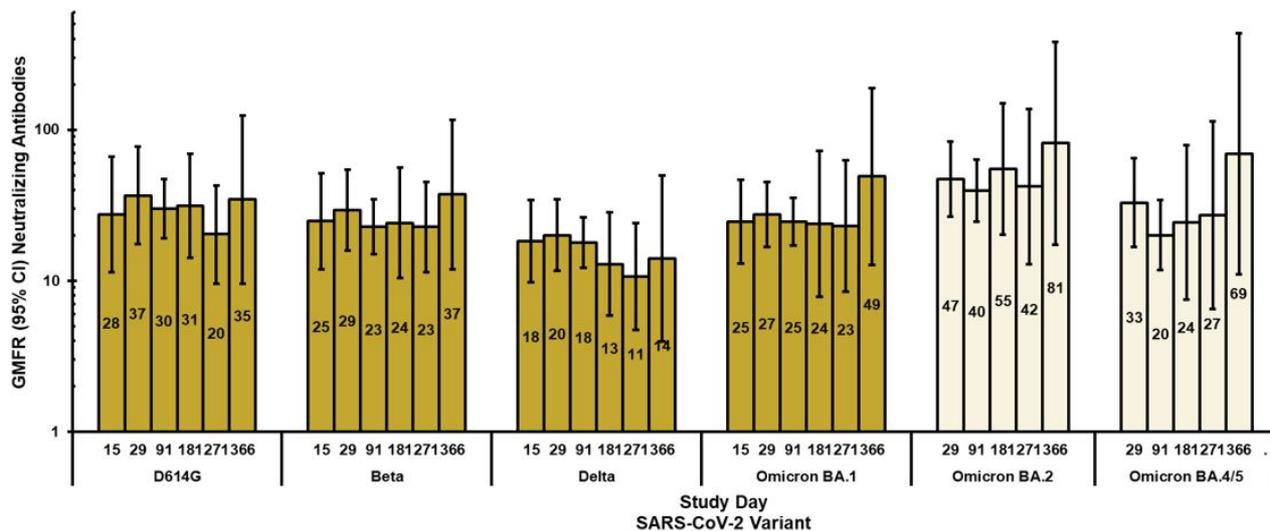
COVID Collaboration Program Updates

Pursuant to a third party study agreement executed in December 2022 with Meiji Seika Pharma Co., Ltd., a subsidiary of Meiji Holdings Co., Ltd. (“Meiji”), a Japanese leader in the area of infectious disease, a Phase 3 clinical trial of ARCT-154 was initiated in Japan by Meiji to evaluate safety and immunogenicity of a booster shot of ARCT-154, and to evaluate non-inferiority and superiority of ARCT-154 as a booster. The trial targeted a total of 780 adult participants, with half in the ARCT-154 group and half in a comparator group (Comirnaty[®], Pfizer-BioNTech), and completed enrollment with 828 participants in February 2023. The interim results of this study demonstrated immunological non-inferiority and superiority of ARCT-154 over the conventional mRNA vaccine as measured by neutralizing antibodies against ancestral SARS-CoV-2 strain and Omicron BA.4/5 subvariant, which was dominated

during the study period. In September 2023, we achieved a development milestone related to the completion of the first GMP batch manufacture of drug product in a multi-dose vial for clinical studies in the SARS-CoV-2 field.

On July 13, 2023, an article with the study results titled “Booster dose of self-amplifying SARS-CoV-2 RNA vaccine vs. mRNA vaccine: a Phase 3 comparison of ARCT-154 with Comirnaty” was posted on medRxiv.org at <https://www.medrxiv.org/content/10.1101/2023.07.13.23292597v1>. Following the completion of the peer review by Lancet Infectious Diseases in October 2023, the journal accepted the manuscript, which should be published by the end of the year. In August 2023, we submitted the primary manuscript with efficacy, immunogenicity and safety results of the pivotal Phase 1/2/3 clinical study of ARCT-154 in Vietnam that completed dosing of over 19,000 participants in 2022. The preprint of this article is available on <https://doi.org/10.21203/rs.3.rs-3329097/v1>. The peer review of the manuscript is ongoing by Nature Communications.

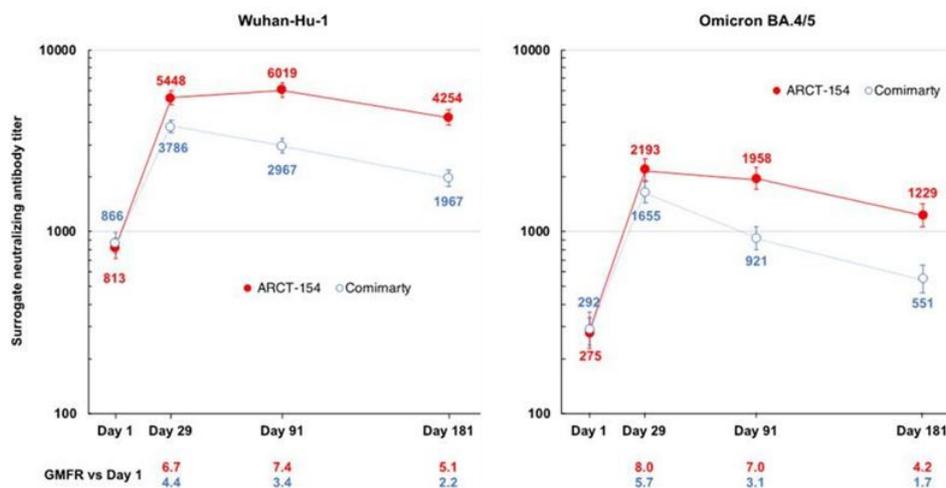
On August 7, 2023, we announced that Phase 1/2 clinical trial data demonstrated one-year durability of immune response following ARCT-154 booster vaccine administration as measured using validated microneutralization (MNT) assays. The geometric mean fold rise (GMFR) in neutralizing antibodies remained greater than 10-fold above baseline for one year across a panel of SARS-CoV-2 variants, including ancestral strain with the D614G mutation, Beta (B.1.351), Delta (B.1.617.2), and Omicron (BA.1, BA.2 and BA.4/5), for participants receiving ARCT-154 booster. The results of this study were presented as a poster at the 9th Influenza Conference of the European Scientific Working Group on Influenza (ESWI) in Valencia, Spain.



Geometric mean fold rise (GMFR) of neutralizing antibodies against SARS-CoV-2 variants (versus pre-booster levels) after ARCT-154 booster vaccination measured by validated pseudoviral microneutralization assays (N=12). Error bars represent the 95% CI. Participants who received any COVID-19 vaccines or had laboratory-confirmed SARS-CoV-2 infection during the follow-up period were excluded from immunogenicity analysis at sampling times after the event.

On November 1, 2023, at the 11th mRNA conference in Berlin, we presented the preliminary 6-month durability data of immune response of our COVID-19 vaccine candidate, ARCT-154, compared to the licensed conventional mRNA vaccine (Comirnaty) from the Phase 3 study in Japan that completed enrollment in February 2023 is now available. The results indicate a

superior antibody persistence of our COVID-19 vaccine over the comparator, as measured by pseudoviral neutralization assays with ancestral SARS-CoV-2 strain and Omicron BA.4/5 subvariant.



On September 29, 2023, CSL's Japanese distribution partner, Meiji, initiated a Phase 3 clinical study with a bivalent version of our COVID-19 vaccine candidate (ancestral strain, ARCT-154 and Omicron BA.4/5) to further support immunogenicity and safety of our self-amplifying mRNA platform and which may facilitate the timely release of future seasonal updates of our COVID-19 vaccine against evolving variants of concern. The study is enrolling healthy adults and individuals with comorbidities, who previously received 2-4 doses of mRNA COVID-19 vaccines, including the last booster at least 3 months prior to recruitment, and has exceeded the targeted enrollment of 850 participants ahead of schedule. The study will compare the investigational vaccine, ARCT-2301 and COMIRNATY (ancestral strain and BA.4/5), for evaluation of safety and immunogenicity between observer-blind groups. Preliminary results of his study are expected by the end of Q1 2024. The results of this study of the bivalent version of our COVID-19 vaccine candidate are not required for approval of ARCT-154 in Japan but will facilitate the timely release of future seasonal updates of the COVID-19 vaccine without the need for additional clinical data.

On September 5, 2023, we announced that the European Medicines Agency (EMA) validated the marketing authorization application (MAA) for ARCT-154, a next generation mRNA vaccine, for active immunization to prevent COVID-19 caused by SARS-CoV-2 in individuals 18 years of age and older.

Flu Collaboration Program Updates

On August 10, 2023, we entered into an amendment to the CSL Collaboration Agreement, pursuant to which CSL Seqirus agreed to make a \$17.5 million milestone payment related to a development milestone for the LUNAR-FLU program under the collaboration. We received this milestone payment during the quarter ended September 30 2023 and the Company intends to use the

proceeds from this milestone payment to fund the Company’s development activities under the LUNAR-FLU program, including the initiation of Phase 1 clinical study.

We have generated a comprehensive non-clinical data package to support the initiation of the Phase 1 clinical trial with a novel influenza mRNA vaccine candidate. All necessary approvals to initiate the Phase 1 study have been received.

Key Updates on Arcturus-Owned mRNA Therapeutic Development Candidates

The following chart represents our current pipeline of Arcturus-Owned mRNA Therapeutic Candidates:

| Franchise | Candidate | Funded By | Indication | Global Prevalence | Upcoming Milestone |
|--------------------|----------------------|---|---------------------------------------|-------------------|-------------------------------|
| Hepatic | LUNAR-OTC (ARCT-810) |  | Ornithine Transcarbamylase Deficiency | > 10,000 | Phase 2 Interim Data H1 2024 |
| Respiratory | LUNAR-CF (ARCT-032) |  | Cystic Fibrosis | 85,000-100,000 | Phase 1b Interim Data H1 2024 |

- LUNAR-OTC/ARCT-810 - We remain committed to our rare disease program for ornithine transcarbamylase (OTC) deficiency.
 - o A Phase 1b study in stable OTC-deficient adults is being conducted in the United States. The trial is designed to assess safety, tolerability and pharmacokinetics of a single dose of ARCT-810, as well as various exploratory biomarkers of drug activity. The study has completed enrollment and dosing of all four cohorts (N = 16 subjects). We expect the final database lock to occur in the fourth quarter of 2023.
 - o A Phase 2 multiple-dose study of ARCT-810 in OTC-deficient adolescents and adults initiated dosing in December 2022 and plans to enroll approximately 24 participants in 2 dose cohorts. The study has been approved by the regulatory authorities in the UK and several other countries in Europe. We are taking various actions to address the continued challenging enrollment rate in Europe, by adding study sites and patient services to eliminate barriers to participation.
 - o In June 2023, the US Food and Drug Administration (the “FDA”) granted Fast Track Designation to ARCT-810. Fast Track Designation is designed to facilitate development and expedite review of new therapeutics intended to treat serious or life-threatening conditions that demonstrate the potential to address important unmet medical needs.
 - o In June 2023, ARCT-810 received Rare Pediatric Disease Designation from the FDA. Such designation is designed to recognize rare pediatric diseases in which the serious or life-threatening manifestations primarily affect patients from birth to 18 years of age. Due to such designation, if ARCT-810 achieves approval for a pediatric indication in the original rare pediatric disease product application in the United States, Arcturus (or the sponsor of ARCT-810) will receive a voucher for priority review of a subsequent marketing application for a different product.
- LUNAR-CF/ARCT-032 – Our program for cystic fibrosis is being supported in part by the Cystic Fibrosis Foundation.
 - o Results from preclinical studies demonstrate robust protein expression in respiratory epithelium treated with LUNAR-mRNA in vitro and in vivo. Further, CF human bronchial epithelial cells treated with ARCT-032 in vitro demonstrate restoration of CFTR activity.
 - o A CTA was filed in December 2022 for the first-in-human study, and we completed dosing of the Phase 1 single ascending dosing study in 32 healthy participants (eight subjects in each of four cohorts).
 - o In August 2023 we received regulatory approval of a protocol amendment to allow the transition to a Phase 1b clinical study of ARCT-032 in up to eight adults with CF, with each participant receiving two administrations of ARCT-032. We initiated Phase 1b enrollment in October 2023, with dosing of first participant scheduled in November 2023.
 - o In September 25, 2023, we entered into an amendment to our Development Program Letter Agreement with the Cystic Fibrosis Foundation Agreement. Please see “Updates on Collaboration Agreements” – “Cystic Fibrosis Foundation Agreement”.

- o On October 25, 2023, ARCT-032 received Rare Pediatric Disease Designation from the FDA. Such designation is designed to recognize rare pediatric diseases in which the serious or life-threatening manifestations primarily affect patients from birth to 18 years of age. Due to such designation, if ARCT-032 achieves approval for a pediatric indication in the original rare pediatric disease product application in the United States, Arcturus (or the sponsor of ARCT-032) will receive a voucher for priority review of a subsequent marketing application for a different product.
- o In November 2023, we presented new data showing proof of activity in vivo (G551D CF Ferret model) at the North American Cystic Fibrosis Conference. The ferrets in the study require continuous treatment with the CFTR modulator ivacaftor to prevent disease progression. A single administration of ARCT-032 showed successful transfection of airway epithelial cells and restoration of mucociliary clearance of ARCT-032 above the level maintained with ivacaftor.

Updates on Collaboration Agreements

CSL Collaboration Agreement.

Please see “Business Updates” – “Updates on Vaccine Program”.

Cystic Fibrosis Foundation Agreement

On May 16, 2017, pursuant to a Development Program Letter Agreement (as amended, the “CFF Agreement”) with the Cystic Fibrosis Foundation (“CFF”), CFF agreed to award us funding for a development program to identify lead CFTR mRNA sequences and LUNAR[®] formulations, demonstrate tolerability of LUNAR[®] CFTR mRNA, and demonstrate translatability of aerosolized LUNAR[®]. The award includes a grant of rights to CFF know-how to assist us to research, develop, commercialize, make or otherwise exploit a product. If the award results in a successful commercialized product, we will pay CFF (i) royalties on sales of the product up to a maximum of a single-digit multiple of the total award amount actually paid to us by CFF, and (ii) thereafter, a single-digit percentage of annual net sales. Further, in the event of a license, sale or other transfer of the product or our development program technology (including a change of control transaction), we will pay CFF a percentage of such license, sale or transfer payments actually received by us or our shareholders (subject to a royalty cap). On August 1, 2019, we entered into an amendment to the CFF Agreement. Pursuant to the amendment, (i) CFF will increase the amount it will award to advance LUNAR-CF, (ii) we will provide a certain amount of matching funds for remaining budgeted costs, and (iii) the related disbursement schedule from CFF to us was modified such that (a) a disbursement was made upon execution of the amendment, (b) an agreed upon amount will be disbursed to us within thirty days of the first day of each of January, April, July and October 2020, and (c) the last payment will be disbursed upon us invoicing CFF to meet good manufacturing practices and submitting an IND application. In January 2022, the parties signed an additional amendment for CFF to fund the development of a CF ferret model for application in the development of ARCT-032, our LUNAR-CF candidate.

On September 25, 2023, we entered into an additional amendment (the “Fourth Amendment”) to the CFF Agreement, pursuant to which we and CFF agreed to: (a) increase the Amount of Award (as defined in the CFF Agreement and applicable amendment) from CFF to advance LUNAR-CF by up to \$9 million (for a total to date of up to approximately \$25 million), and required Arcturus to provide \$15 million in matching funds for remaining budgeted costs; (b) modify the existing rates and caps on royalties due to CFF under the CFF Agreement, including the addition of an option for Arcturus to reduce the royalty rate through a one-time payment; (c) modify the calculation of payments from Arcturus to CFF in the event of certain dispositions or licensing of cystic fibrosis or other pulmonary assets or of a change of control of Arcturus; and (d) make corresponding changes to exhibits, definitions and other provisions of the CFF Agreement.

CureVac

On January 1, 2018, we entered into a Development and Option Agreement with CureVac, which was amended on May 3, 2018, restated on September 28, 2018 and amended on July 24, 2019 (as amended and restated, the “Development and Option Agreement”). Under the terms of the Development and Option Agreement, CureVac and Arcturus agreed to conduct joint preclinical development programs and we granted CureVac a license to develop and commercialize certain products incorporating certain of our technology (the “Arcturus LMD Technology”) and CureVac technology. CureVac did not exercise its option to extend the term prior to its expiration, and the Development and Option Agreement expired as of July 24, 2023.

Updates on ARCALIS Joint Venture

On August 14, 2023, we announced that ARCALIS Inc. (ARCALIS), our manufacturing joint venture in Japan to support the production of mRNA vaccines and therapeutics, had been awarded up to \$115 million in two separate grants from the Japanese government. We anticipate that these grants will be used to fund the construction of a factory and the purchase of capital equipment to support current Good Manufacturing Practice (cGMP) production of mRNA drug substance and mRNA drug product operations.

On October 4, 2023, we announced that ARCALIS was selected by the Japanese Ministry of Economy, Trade and Industry to receive additional financial support to construct a DNA template manufacturing facility along with new state-of-the-art equipment. DNA plasmid generated at this facility would be used as key starting material in the manufacture of mRNA drug substance at

ARCALIS' neighboring mRNA drug substance facility, which was completed in July 2023. To date, approximately \$165 million has been awarded to ARCALIS by the Japanese government, subject to certain terms and conditions, to build mRNA Drug Substance, mRNA Drug Product manufacturing capabilities and to construct a DNA template manufacturing facility. As of November 6, 2023, our ownership in ARCALIS is 36.7%.

Updates on Research and Platform Activities

We continue to conduct exploratory platform development activities, including the evaluation of genome editing, and new targeting approaches, where our LUNAR[®] and STARR[®] platforms could potentially be useful for identification and development of additional products for our portfolio.

Updates on Supply and Manufacturing

We have built a global manufacturing footprint with our partners, including Alvepron, Catalent, Recipharm, Polymun and ARCALIS. With such collaborations we have established an Integrated Global Supply Chain Network with our primary and secondary sourcing contract development & manufacturing organizations (CDMOs) based in the United States, EU and Asia for producing critical raw materials, drug substance, and packaged finished product. As the market for COVID vaccines shifts from multi-dose vial formats to lower and single-dose vial formats, we continue, with our collaborator CSL Seqirus, to evaluate and advance manufacturing process and capabilities and technology transfers, and prepare for stockpiling and commercialization of COVID vaccines.

Results of Operations

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our condensed consolidated financial statements and related notes appearing elsewhere in this Report and our audited financial statements and related notes for the year ended December 31, 2022. Our historical results of operations and the year-to-year comparisons of our results of operations that follow are not necessarily indicative of future results.

Revenue

We enter into arrangements with pharmaceutical and biotechnology partners and government agencies that may contain upfront payments, license fees for research and development arrangements, research and development funding, milestone payments, option exercise and exclusivity fees, royalties on future sales, consulting fees and payments for technology transfers. The following table summarizes our total revenues for the periods indicated:

| (in thousands) | Three Months Ended September 30, | | 2022 to 2023 | |
|----------------|----------------------------------|-----------|--------------|----------|
| | 2023 | 2022 | \$ change | % change |
| Revenue | \$ 45,140 | \$ 13,369 | \$ 31,771 | * |

* Greater than 100%

Revenue increased by \$31.8 million during the three months ended September 30, 2023 as compared to the three months ended September 30, 2022. The increase was primarily attributable to \$45.2 million of revenue recognized from the collaboration agreement and flu Phase I agreement with CSL Seqirus, as well as grant revenue recognized from the agreement with BARDA, which were both executed in the second half of 2022 with negligible revenue recognized during the third quarter of 2022. The increase was primarily offset by a decrease in revenue of \$13.4 million related to decreased revenue recognized as a result of the termination of collaboration agreements with CureVac, UGX, Janssen and Vinbiocare.

| (in thousands) | Nine Months Ended September 30, | | 2022 to 2023 | |
|----------------|---------------------------------|-----------|--------------|----------|
| | 2023 | 2022 | \$ change | % change |
| Revenue | \$ 135,944 | \$ 45,706 | \$ 90,238 | * |

* Greater than 100%

Revenue increased by \$90.2 million during the nine months ended September 30, 2023 as compared to the nine months ended September 30, 2022. The increase was attributable to an increase in revenue of \$133.0 million primarily related to the collaboration agreement with CSL Seqirus and the grant agreement with BARDA which were both executed in the second half of 2022. The increase was primarily offset by decreases in revenue of the following: (i) \$27.2 million related to the termination of the agreement

with Vinbiocare, (ii) \$12.5 million related to the agreement with the Israeli Ministry of Health, (iii) \$1.9 million related to the termination of the agreement with Janssen and (iv) \$1.0 million related to the termination of the agreement with UGX.

Our operating expenses consist of research and development and general and administrative expenses.

| (in thousands) | Three Months Ended September 30, | | 2022 to 2023 | | Nine Months Ended September 30, | | 2022 to 2023 | |
|-------------------------------|-------------------------------------|------------------|------------------|----------|------------------------------------|-------------------|------------------|----------|
| | 2023 | 2022 | \$ change | % change | 2023 | 2022 | \$ change | % change |
| Operating expenses: | | | | | | | | |
| Research and development, net | \$ 51,077 | \$ 37,688 | \$ 13,389 | 35.5 % | \$ 155,513 | \$ 120,770 | \$ 34,743 | 28.8 % |
| General and administrative | 13,377 | 12,488 | 889 | 7.1 % | 40,364 | 34,211 | 6,153 | 18.0 % |
| Total | <u>\$ 64,454</u> | <u>\$ 50,176</u> | <u>\$ 14,278</u> | 28.5 % | <u>\$ 195,877</u> | <u>\$ 154,981</u> | <u>\$ 40,896</u> | 26.4 % |

Research and Development Expenses, net

The following table presents our total research and development expenses by category:

| (in thousands) | Three Months Ended September 30, | | 2022 to 2023 | | Nine Months Ended September 30, | | 2022 to 2023 | |
|--|-------------------------------------|------------------|------------------|----------|------------------------------------|-------------------|------------------|----------|
| | 2023 | 2022 | \$ change | % change | 2023 | 2022 | \$ change | % change |
| External pipeline development expenses: | | | | | | | | |
| LUNAR-COVID, net | \$ 24,892 | \$ 16,018 | \$ 8,874 | 55.4 % | \$ 71,501 | \$ 60,774 | \$ 10,727 | 17.7 % |
| LUNAR-OTC, net | 2,001 | 2,063 | (62) | -3.0 % | 7,520 | 6,471 | 1,049 | 16.2 % |
| Early-stage programs | 3,256 | 2,801 | 455 | * | 11,594 | 7,031 | 4,563 | * |
| Discovery technologies | 4,662 | 3,680 | 982 | * | 16,266 | 8,287 | 7,979 | * |
| External platform development expenses: | | | | | | | | |
| Personnel related expenses | 13,478 | 11,013 | 2,465 | 22.4 % | 40,206 | 31,862 | 8,344 | 26.2 % |
| Facilities and equipment expenses | 2,788 | 2,113 | 675 | 31.9 % | 8,426 | 6,345 | 2,081 | 32.8 % |
| Total research and development expenses, net | <u>\$ 51,077</u> | <u>\$ 37,688</u> | <u>\$ 13,389</u> | 35.5 % | <u>\$ 155,513</u> | <u>\$ 120,770</u> | <u>\$ 34,743</u> | 28.8 % |

* Greater than 100%

Our research and development expenses consist primarily of external manufacturing costs, in-vivo research studies and clinical trials performed by contract research organizations, clinical and regulatory consultants, personnel related expenses, facility related expenses and laboratory supplies related to conducting research and development activities. Research and development expenses were \$51.1 million for the three months ended September 30, 2023, compared with \$37.7 million in the comparable period last year, primarily reflecting increased clinical research and manufacturing costs of \$11.6 million and an increase of \$2.0 million in personnel related costs, an increase in travel and consulting expenses of \$0.2 million, an increase of \$0.7 million in facilities expense and offset by a decrease of contra research and development expenses recognized of \$1.1 million. Research and development expenses were \$155.5 million for the nine months ended September 30, 2023, compared with \$120.8 million in the comparable period last year, primarily reflecting increased manufacturing costs of \$27.8 million, an increase of \$5.7 million in personnel related costs, an increase in consulting expenses of \$1.4 million, an increase of \$2.1 million in facilities expense and a decrease of contra research and development expenses recognized of \$1.6 million. The increase was primarily offset by a decrease of clinical-related expenses of \$3.9 million. We expect that our research and development efforts and associated costs will increase and continue to be substantial over the next several years as our pipeline progresses.

Early-stage programs represent programs that are in the pre-clinical or Phase 1 clinical stage and may be partnered or unpartnered, including the LUNAR-CF and LUNAR-FLU programs. Discovery technologies represent our efforts to expand our product pipeline and are primarily related to pre-partnered studies and new capabilities assessment. For some of our programs, the activities are part of our collaborative and other relationships and the expenses may be partially offset with funds that have been awarded to the Company. The expenses primarily consist of external manufacturing costs, lab supplies, equipment, and consulting and professional fees. Both early stage programs and discovery technologies expenses are expected to steadily increase over the coming years.

Personnel related expenses primarily consist of employee salaries and benefits, share-based compensation and consultants. Although such expenses increased during 2023 as compared to 2022, we expect that they will not increase over the next twelve months.

Facilities and equipment expenses increased during the nine months ended September 30, 2023 as a result of increased rent and associated costs related to a new facility we took possession of in April 2022. Facilities and equipment expenses are not expected to increase during the next twelve months.

General and Administrative Expenses

General and administrative expenses primarily consist of salaries and related benefits for our executive, administrative, legal and accounting functions and professional service fees for legal and accounting services as well as other general and administrative expenses. The Company does not expect that general and administrative expenses will increase on a yearly basis from the current quarter September 30, 2023 expense trend.

General and administrative expenses were \$13.4 million and \$40.4 million for the three and nine months ended September 30, 2023, respectively, compared with \$12.5 million and \$34.2 million in the comparable periods last year. These increases in expenses resulted primarily from increased personnel expenses due to increased headcount and salaries, increased travel and consulting expenses as well as increased rent expense associated with the new facility. The Company does not expect that general and administrative expenses will increase on a yearly basis from the current quarter September 30, 2023 expense trend.

Finance income (expense), net

| (in thousands) | Three Months Ended September 30, | | 2022 to 2023 | | Nine Months Ended September 30, | | 2022 to 2023 | |
|------------------|-------------------------------------|----------|--------------|----------|------------------------------------|------------|--------------|----------|
| | 2023 | 2022 | \$ change | % change | 2023 | 2022 | \$ change | % change |
| Interest income | \$ 4,001 | \$ 444 | \$ 3,557 | * | \$ 10,473 | \$ 766 | \$ 9,707 | * |
| Interest expense | (20) | (765) | 745 | -97.4 % | (763) | (2,211) | 1,448 | -65.5 % |
| Total | \$ 3,981 | \$ (321) | \$ 4,302 | * | \$ 9,710 | \$ (1,445) | \$ 11,155 | * |

* Greater than 100%

Interest income is generated on cash and cash equivalents. The increase in interest income for the three and nine month periods ended September 30, 2023 as compared to the comparable periods last year was primarily the result of increased interest rates and an increased cash balance due to large cash amounts received under the CSL Seqirus agreement. Interest expense decreased as no interest expense was incurred during the second and third quarters of 2023 related to the extinguishment of the Western Alliance Agreement and the forgiveness of the Singapore Loan during the first quarter of 2023.

Other income and expense

| (in thousands) | Three Months Ended September 30, | | 2022 to 2023 | | Nine Months Ended September 30, | | 2022 to 2023 | |
|------------------------------------|-------------------------------------|----------|--------------|----------|------------------------------------|----------|--------------|----------|
| | 2023 | 2022 | \$ change | % change | 2023 | 2022 | \$ change | % change |
| Loss from equity-method investment | \$ — | \$ — | \$ — | 0.0 % | \$ — | \$ (515) | \$ 515 | -100.0 % |
| Gain (loss) from foreign currency | 4 | 1,862 | (1,858) | -99.8 % | (175) | 3,237 | (3,412) | * |
| Gain on debt extinguishment | — | — | — | 0.0 % | 33,953 | — | 33,953 | 100.0 % |
| Total | \$ 4 | \$ 1,862 | \$ (1,858) | -99.8 % | \$ 33,778 | \$ 2,722 | \$ 31,056 | * |

* Greater than 100%

Other income and expense items primarily relate to gains and losses from equity-method investments and foreign currency transactions. Additionally, we recorded a gain on debt extinguishment related to the Singapore Loan of \$34.0 million during the first quarter of 2023 as a result of the Singapore Loan being forgiven.

We recorded no gain or loss in the three and nine months ended September 30, 2023, compared with no gain or loss in the three months ended September 30, 2023 and \$0.5 million losses in the nine months ended September 30, 2022 in connection with our investment in GRI Bio, Inc. (formerly Vallon Pharmaceuticals, Inc.)

The changes in gain (loss) from foreign currency for the three and nine months ended September 30, 2023 compared to the three and nine months ended September 30, 2022 were primarily attributable to the Singapore Loan being forgiven during the first quarter of 2023. The remaining amounts recorded as gain (loss) from foreign currency relate to transactions made in foreign currencies.

Off-balance sheet arrangements

Through September 30, 2023, we have not entered into and did not have any relationships with unconsolidated entities or financial collaborations, such as entities often referred to as structured finance or special purpose entities, established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes.

Liquidity and Capital Resources

From the Company's inception through the quarter ended September 30, 2023, the Company has funded its operations principally with the proceeds from the sale of capital stock, long-term debt and revenues earned through collaboration agreements and government contracts. We received a \$200.0 million upfront payment from CSL Seqirus during the fourth quarter of 2022. Additionally, in the three months ended June 30, 2023, we received \$90.0 million in milestone payments and \$23.6 million for the manufacturing and supply of ARCT-154 from CSL Seqirus. We expect to receive future payments from CSL Seqirus primarily by meeting future milestones related to the CSL Collaboration Agreement. At September 30, 2023, we had \$311.9 million in unrestricted cash and cash equivalents which includes amounts borrowed of \$20.0 million from the Wells Fargo Credit Agreement. Balances outstanding under the line of credit will vary from quarter to quarter as cash flow from collaborations fluctuate.

CSL Seqirus, Inc. Collaboration and License Agreement

We entered into the CSL Collaboration Agreement with CSL Seqirus, a part of CSL Limited, one of the world's leading influenza vaccine providers, for the global exclusive rights to research, develop, manufacture and commercialize mRNA vaccines.

CSL Seqirus received exclusive global rights to our technology for vaccines against SARS-CoV-2 (COVID-19), influenza and three other respiratory infectious diseases with non-exclusive rights to pandemic pathogens. We received an up-front payment of \$200.0 million during the fourth quarter of 2022. We will be eligible to receive development milestones totaling more than \$1.3 billion if all products are registered in the licensed fields. We will also be entitled to receive up to \$3.0 billion in commercial milestones based on "net sales" of vaccines in the various fields.

In addition, we are entitled to receive a 40% share of net profits from COVID-19 vaccine sales and up to low double-digit royalties of annual net sales for vaccines against influenza and the other three specified infectious disease pathogens, as well as royalties on revenues from vaccines that may be developed for pandemic preparedness.

The CSL Collaboration Agreement sets forth how CSL Seqirus and us shall collaborate to research and develop vaccine candidates. In the COVID-19 field, we will lead activities for certain regulatory filings for ARCT-154 in the US and Europe and for research and development activities of a next-generation COVID vaccine candidate. CSL Seqirus will lead and be responsible for all other research and development in COVID-19, influenza and the other fields.

Wells Fargo Credit Agreement

On April 21, 2023, the Company's wholly-owned subsidiary, Arcturus Therapeutics, Inc. entered into a credit agreement with Wells Fargo Bank, National Association ("Wells Fargo") whereby Wells Fargo agreed to make a \$50.0 million revolving credit line available to the Company (the "Wells Fargo Loan") and each Wells Fargo Loan evidenced by a revolving line of credit note (the "Note").

Borrowings under the agreement will bear interest at a rate of 1.00% above either the Daily Simple SOFR or Term SOFR (as such terms are defined in the Wells Fargo Note), with "SOFR" being the rate per annum equal to the secured overnight financing rate as administered by the Federal Reserve Bank of New York. If an Event of Default (as defined in the credit agreement) occurs, then all Wells Fargo Loans shall bear interest at a rate equal to 2.00% above the interest rate applicable immediately prior to the occurrence of the Event of Default.

The term of the agreement is two years, with an option for one-year renewals subject to Wells Fargo approval and the Company furnishing to Wells Fargo a non-refundable commitment fee equal to 0.25% of the Wells Fargo Loan amount for each such renewal. There is no penalty for terminating the agreement. There is no penalty for terminating the facility prior to the maturity date of the Wells Fargo Note. As collateral, the Company has agreed to pledge \$55.0 million in cash to be held at the Company's securities accounts with Wells Fargo Securities, LLC, an affiliate of Wells Fargo, pursuant to a security agreement. During the three months ended September 30, 2023, we drew down \$20.0 million which was subsequently repaid in October 2023.

Grant from the Biomedical Advanced Research and Development Authority

On August 31, 2022, we entered into a cost reimbursement contract (the "BARDA Contract") with the Biomedical Advanced Research and Development Authority ("BARDA"), a division of the Office of the Assistant Secretary for Preparedness and Response (ASPR) within the U.S. Department of Health and Human Services (HHS) to support the development of a low-dose pandemic influenza candidate based on our proprietary self-amplifying messenger RNA-based vaccine platform. The BARDA Contract is to support our non-clinical and pre-clinical development, early-stage clinical development through Phase 1, and associated drug product

manufacturing, regulatory and quality-assurance activities over a period of three years. It provides for reimbursement by BARDA of our permitted costs up to \$63.2 million.

Vinbiocare Agreement

During 2021, we entered into a technology license and technical support agreement and the framework drug substance supply agreement with Vinbiocare, a member of Vingroup Joint Stock Company (collectively, the “Vinbiocare License & Supply Agreements”), whereby we would provide technical expertise and support services to Vinbiocare to assist in the build out of an mRNA drug product manufacturing facility in Vietnam. We received an upfront payment in aggregate of \$40.0 million as part of the Vinbiocare License and Supply Agreements. In October 2022, in association with the termination of the Vinbiocare License and Supply Agreements, we signed the Vinbiocare Support Agreement with Vinbiocare which continues Vinbiocare’s clinical obligations and reserved a portion of the original \$40.0 million upfront payment received from the License and Supply Agreements to be paid over the future periods.

The Vinbiocare Support Agreement requires us to pay to Vinbiocare certain limited payments, including upon the occurrence of specified events through the first quarter of 2025. Vinbiocare is also eligible to receive a single digit percentage of amounts received by Arcturus on net sales, if any, of ARCT-154 (or next-generation COVID vaccine) up to a capped amount.

General Financial Resources

A portion of our current cash balance is expected to be utilized during fiscal year 2023 to fund (i) the continued Phase 2 trial of ARCT-810, our LUNAR-OTC candidate, (ii) advances to our LUNAR-CF program in clinical trials, (iii) expenses incurred prior to customer payments under the CSL Collaboration Agreement and BARDA agreement and (iv) continued exploratory activities related to our platform and other general administrative activities.

Our future capital requirements are difficult to forecast and will depend on many factors that are out of our control. If we are unable to maintain sufficient financial resources, our business, financial condition and results of operations will be materially and adversely affected. There can be no assurance that we will be able to obtain additional needed financing on acceptable terms or at all. Additionally, equity or debt financings may have a dilutive effect on the holdings of our existing shareholders.

We expect to continue to incur additional losses in the long term, and we will need to execute on milestones within the CSL Collaboration Agreement, raise additional debt or equity financing or enter into additional partnerships to fund development. Our ability to transition to profitability is dependent on executing on milestones within the CSL Collaboration Agreement and identifying and developing successful mRNA drug and vaccine candidates. If we are not able to achieve planned milestones or incur costs in excess of our forecasts, we will need to reduce discretionary spending, discontinue the development of some or all of our programs, which will delay part of our development programs, all of which will have a material adverse effect on our ability to achieve our intended business objectives.

Funding Requirements

We anticipate that we will continue to generate losses for the foreseeable future, and we expect the losses to increase as we continue the development of, and seek regulatory approvals for, our product candidates, and begin commercialization of our products. As a result, we will require additional capital to fund our operations in order to support our long-term plans. We believe that our current cash position will be sufficient to meet our anticipated cash requirements through at least the next twelve months, assuming, among other things, no significant unforeseen expenses and continued funding from partners at anticipated levels. We intend to seek additional capital through equity and/or debt financings, collaborative or other funding arrangements with partners or through other sources of financing. Should we seek additional financing from outside sources, we may not be able to raise such financing on terms acceptable to us or at all. If we are unable to raise additional capital when required or on acceptable terms, we may be required to scale back or discontinue the advancement of product candidates, reduce headcount, liquidate our assets, file for bankruptcy, reorganize, merge with another entity, or cease operations.

Our future funding requirements are difficult to forecast and will depend on many factors, including the following:

- the development of our LUNAR-COV19 and LUNAR-FLU vaccine candidates;
- the achievement of milestones under our strategic alliance agreements;
- maintaining and/or expanding our manufacturing network and capabilities;
- the terms and timing of any other strategic alliance, licensing and other arrangements that we may establish, including those with CSL Seqirus and CSL Seqirus’ arrangement with Meiji, and any related payments thereunder;
- the initiation, progress, timing and completion of preclinical studies and clinical trials for our product candidates;
- the number and characteristics of product candidates that we pursue;
- the outcome, timing and cost of regulatory approvals;

- delays that may be caused by changing regulatory requirements;
- the cost and timing of hiring new employees to support our continued growth;
- the costs involved in filing and prosecuting patent applications and enforcing and defending patent claims;
- the costs and timing of procuring clinical and commercial supplies of our product candidates;
- the costs and timing of establishing sales, marketing and distribution capabilities;
- the costs associated with legal proceedings;
- the costs associated with potential litigation related to collaboration agreements; and
- the extent to which we acquire or invest in businesses, products or technologies.

Critical Accounting Policies and Estimates

We prepare our condensed consolidated financial statements in conformity with GAAP. As such, we make certain estimates, judgments and assumptions that we believe are reasonable, based upon information available to us. These judgments involve making estimates about the effect of matters that are inherently uncertain and may significantly impact our reported results of operations and financial condition. We describe our significant accounting policies more fully in Note 2 to our consolidated financial statements for the year ended December 31, 2022.

There have been no material changes to our critical accounting policies and estimates from the information provided in Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations, included in the 2022 Annual Report.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

Our primary exposure to market risk is interest income sensitivity, which is affected by changes in the general level of interest rates in the United States. Due to the nature of our cash and cash equivalents, we believe that we are not subject to any material market risk exposure. We do not have any foreign currency or other derivative financial instruments.

Item 4. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

As required by Rule 13a-15(b) and Rule 15d-15(b) of the Exchange Act, our management, including our principal executive officer, our principal financial officer and our principal accounting officer, conducted an evaluation as of the end of the period covered by this Quarterly Report on Form 10-Q of the effectiveness of the design and operation of our disclosure controls and procedures. Based on that evaluation, management has concluded that as of September 30, 2023, the Company's disclosure controls and procedures were effective at the reasonable assurance level, and we believe the condensed consolidated financial statements included in this Form 10-Q for the quarterly periods ended September 30, 2023 fairly present, in all material respects, our financial position, results of operations, comprehensive loss, statements of stockholders' equity and cash flows for the periods presented in conformity with U.S. generally accepted accounting principles.

Changes in Internal Control over Financial Reporting

As required by Rule 13a-15(d) and Rule 15d-15(d) of the Exchange Act, our management, including our principal executive officer, our principal financial officer and our principal accounting officer, conducted an evaluation of the internal control over financial reporting to determine whether any other changes occurred during the period covered by this Quarterly Report on Form 10-Q that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. Based on that evaluation, our principal executive officer, principal financial officer and principal accounting officer concluded that there were no changes in our internal controls over financial reporting during the periods covered by this Quarterly Report on Form 10-Q that materially affected, or were reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

Item 1. Legal Proceedings.

From time to time, we may be involved in various legal proceedings and subject to claims that arise in the ordinary course of business, including those related to governmental inquiries, intellectual property and commercial relationships. The subject matter of any such legal proceedings or claims are or will be highly complex and subject to substantial uncertainties. The outcome of any such proceedings or claims, regardless of the merits, are and will be inherently uncertain; therefore, assessing the likelihood of loss and any estimated damages is difficult and subject to considerable judgment.

Item 1A. Risk Factors.

Our business is subject to various risks, including those described in Item 1A of our Annual Report on Form 10-K for the fiscal year ended December 31, 2022, which we strongly encourage you to review. Other than as set forth below, there have been no material changes from the risk factors described in our Annual Report on Form 10-K for the year ended December 31, 2022 filed with the Commission on March 29, 2023 and in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2023 filed with the Commission on August 7, 2023.

Evolving dynamics in the market for COVID-19 vaccines are likely to impact our financial results.

With the global transition of COVID-19 from pandemic to endemic, the commercial market for COVID-19 vaccines is facing several challenges, including a more fragmented customer base, less predictability in orders, greater seasonality of demand, increased distribution costs, and higher costs of goods sold due to single-dose or lower-dose presentations. Such factors could impact the potential market for our COVID-19 vaccine (under our collaboration with CSL Seqirus), if approved. Further, our continued development efforts for our COVID-19 vaccine could face increased research and development costs, including for clinical trials, when updating COVID-19 vaccines for new variants of concern.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds.

None.

Item 3. Defaults Upon Senior Securities.

None.

Item 4. Mine Safety Disclosures.

Not applicable.

Item 5. Other Information.

Rule 10b5-1 Trading Arrangements

During the three months ended September 30, 2023, none of our directors or officers adopted or terminated a "Rule 10b5-1 trading arrangement" (as defined in Item 408 of Regulation S-K of the Exchange Act) intended to satisfy the affirmative defense conditions of Rule 10b5-1(c) under the Exchange Act, other than as follows:

- Kieth C. Kummerfeld, Senior Vice President, Corporate Controller and Principal Accounting Officer, modified an existing Rule 10b5-1 trading arrangement on August 24, 2023. Mr. Kummerfeld's trading arrangement provides for the exercise of up to an aggregate of 36,064 options to purchase common stock and subsequent sale of such underlying shares of common stock, until August 23, 2024.

There were no "non-Rule 10b5-1 trading arrangements" (as defined in Item 408 of Regulation S-K of the Exchange Act) adopted or terminated during the three months ended September 30, 2023 by our directors and officers.

Item 6. Exhibits.**Exhibit Index**

| Exhibit Number | Description |
|----------------|---|
| 3.1 | <u>Certificate of Incorporation. Incorporated by reference to Annex B to the proxy statement/prospectus which forms part of the Registration Statement on Form S-4 filed on March 18, 2019 (File No. 333-230353).</u> |
| 3.2 | <u>Certificate of Amendment, dated November 25, 2020. Incorporated by reference to Exhibit 3.1 to Form 8-K filed on November 25, 2020 (File No. 001-38942).</u> |
| 3.3 | <u>Bylaws of Arcturus Therapeutics Holdings Inc. Incorporated by reference to Exhibit 3.2 to the Company's Registration Statement on Form S-3, filed with the SEC on May 8, 2020 (File No. 333-238139).</u> |
| 4.1 | <u>Description of Registrant's Securities. Incorporated by reference to Exhibit 4.1 to the Company's Annual Report on Form 10-K for the year ended December 31, 2021 filed on February 28, 2022 (File No. 001-38942).</u> |
| 10.1† | <u>Form of Indemnification Agreement. Incorporated by reference to Exhibit 10.1 to the Company's Annual Report on Form 10-K for the year ended December 31, 2019 filed on March 16, 2020 (File No. 001-38942).</u> |
| 10.2† | <u>Amended and Restated 2019 Omnibus Equity Incentive Plan. Incorporated by reference Exhibit 4.3 to the Registration Statement on Form S-8 filed on August 5, 2020 (File No. 333-240397).</u> |
| 10.3** | <u>Amended and Restated Amendment to Development and Option Agreement, dated as of September 28, 2018, by and between CureVac AG and Arcturus Therapeutics Inc. Incorporated by reference to Exhibit 99.2 to the Company's Report of Foreign Private Issuer on Form 6-K filed on October 1, 2018 (File No. 001-35932).</u> |
| 10.4** | <u>Research and Exclusive License Agreement, by and between Arcturus Therapeutics, Inc. and Synthetic Genomics, Inc., effective October 24, 2017. Incorporated by reference to Exhibit 4.8 to Form 20-F filed on May 14, 2018 (File No. 001-35932).</u> |
| 10.5** | <u>Research Collaboration and License Agreement, by and between Arcturus Therapeutics, Inc. and Ultragenyx Pharmaceutical Inc., entered into as of October 26, 2015, as amended October 17, 2017 and April 20, 2018. Incorporated by reference to Exhibit 4.10 to Form 20-F filed on May 14, 2018 (File No. 001-35932).</u> |
| 10.6** | <u>Third Amendment to Research Collaboration and License Agreement, by and between Arcturus Therapeutics, Inc. and Ultragenyx Pharmaceutical Inc., effective June 18, 2019. Incorporated by reference to Exhibit 10.2 to Form 8-K filed on June 20, 2019 (File No. 001-38942).</u> |
| 10.7** | <u>Letter Agreement, by and between Arcturus Therapeutics, Inc. and the Cystic Fibrosis Foundation, dated May 16, 2017. Incorporated by reference to Exhibit 4.11 to Form 20-F filed on May 14, 2018 (File No. 001-35932).</u> |
| 10.8** | <u>Amendment No. 2 to Letter Agreement, by and between Arcturus Therapeutics, Inc. and the Cystic Fibrosis Foundation, dated August 1, 2019. Incorporated by reference to Exhibit 10.16 to Form 10-Q filed on August 14, 2019.</u> |
| 10.9** | <u>Development and Option Agreement, by and between Arcturus Therapeutics, Inc. and CureVac AG, dated January 1, 2018, as amended May 3, 2018. Incorporated by reference to Exhibit 4.12 to Form 20-F filed on May 14, 2018 (File No. 001-35932).</u> |
| 10.10** | <u>Third Amendment to Development and Option Agreement, by and between Arcturus Therapeutics, Inc. and CureVac AG, dated July 26, 2019. Incorporated by reference to Exhibit 10.20 to Form 10-Q filed on August 14, 2019 (File No. 001-38942).</u> |
| 10.11** | <u>License Agreement, by and between Arcturus Therapeutics, Inc., as successor-in-interest to Marina Biotech, Inc., and Protiva Biotherapeutics Inc., dated as of November 28, 2012. Incorporated by reference to Exhibit 4.14 to Form 20-F/A filed on July 10, 2018 (File No. 001-35932).</u> |
| 10.12** | <u>Patent Assignment and License Agreement, by and between Arcturus Therapeutics, Inc. and Marina Biotech, Inc., dated as of August 9, 2013. Incorporated by reference to Exhibit 4.15 to Form 20-F filed on May 14, 2018 (File No. 001-35932).</u> |
| 10.13 | <u>Share Exchange Agreement, dated as of February 11, 2019, by and between Arcturus Therapeutics Ltd. and Arcturus Therapeutics Holdings Inc. Incorporated by reference to Exhibit 10.13 to the Company's Annual Report on Form 10-K for the year ended December 31, 2018 filed on March 18, 2019 (File No. 001-35932).</u> |

- 10.14 [Lease Agreement, by and between Arcturus Therapeutics, Inc. and ARE-SD Region No. 44, LLC, dated October 4, 2017. Incorporated by reference to Exhibit 4.6 to Form 20-F filed on May 14, 2018. \(File No. 001-35932\).](#)
- 10.15 [First Amendment to Lease Agreement, by and between Arcturus Therapeutics Holdings Inc. and ARE-SD Region No. 44, LLC dated February 1, 2020. Incorporated by reference to Exhibit 10.23 to the Company's Annual Report on Form 10-K for the year ended December 31, 2019 filed on March 16, 2020 \(File No. 001-38942\).](#)
- 10.16** [Acceptance Letter, dated March 4, 2020, by and between Arcturus Therapeutics Holdings Inc. and the Economic Development Board of Singapore. Incorporated by reference to Exhibit 10.24 to the Company's Annual Report on Form 10-K for the year ended December 31, 2019 filed on March 16, 2020 \(File No. 001-38942\).](#)
- 10.17† [2020 Employee Stock Purchase Plan. Incorporated by reference to Exhibit 4.3 to Form S-8 filed on August 5, 2020 \(File No. 333-240392\).](#)
- 10.18 [Second Amendment to Lease, by and between Arcturus Therapeutics, Inc. and ARE-SD Region No. 44, LLC, dated November 13, 2020. Incorporated by reference to Exhibit 10.29 to the Company's Annual Report on Form 10-K for the year ended December 31, 2020 filed on March 1, 2020 \(File No. 001-38942\).](#)
- 10.19 [Third Amendment to Lease, by and between Arcturus Therapeutics, Inc. and ARE-SD Region No. 44, LLC, dated February 25, 2021. Incorporated by reference to Exhibit 10.30 to the Company's Annual Report on Form 10-K for the year ended December 31, 2020 filed on March 1, 2020 \(File No. 001-38942\).](#)
- 10.20 [Arcturus Therapeutics Holdings Inc. Severance Policy for Executives. Incorporated by reference to Exhibit 10.1 to Current Report on Form 8-K filed on April 26, 2021 \(File No. 001-38942\).](#)
- 10.21 [Lease, by and between Arcturus Therapeutics, Inc. and TPSC IX, LLC, dated September 29, 2021. Incorporated by reference to Exhibit 10.35 to Form 10-Q filed on November 9, 2021 \(File No. 001-38942\).](#)
- 10.22† [Arcturus Therapeutics Holdings Inc. 2021 Inducement Equity Incentive Plan. Incorporated by reference to Exhibit 4.1 to the Registration Statement on Form S-8 filed on October 20, 2021 \(File No. 333-260391\).](#)
- 10.23† [Amended and Restated 2019 Omnibus Equity Incentive Plan, as amended. Incorporated by reference to Exhibit 4.3 to the Registration Statement on Form S-8 filed on June 30, 2022.](#)
- 10.24** [Cost Reimbursement Contract dated August 31, 2022, by and between Arcturus Therapeutics Holdings Inc. and Biomedical Advanced Research and Development Authority of the U.S. Department of Health and Human Services. Incorporated by reference to Exhibit 10.36 to Quarterly Report on Form 10-Q filed on November 9, 2022 \(File No. 001-38942\).](#)
- 10.25** [Study Support Agreement, dated October 31, 2022, by and between Arcturus Therapeutics, Inc. and Vinbiocare Research and Manufacture Joint Stock Company. Incorporated by reference to Exhibit 10.1 to Current Report on Form 8-K filed on November 4, 2022 \(File No. 001-38942\).](#)
- 10.26** [Collaboration and License Agreement, dated November 1, 2022, by and between Arcturus Therapeutics Holdings Inc. and CSL Limited. Incorporated by reference to Exhibit 10.38 to Quarterly Report on Form 10-Q filed on November 9, 2022 \(File No. 001-38942\).](#)
- 10.27** [Manufacturing Support Agreement Termination Letter, dated March 23, 2023, by and between Arcturus Therapeutics, Inc. and the Economic Development of Singapore. Incorporated by reference to Exhibit 10.41 to Annual Report on Form 10-K filed on March 29, 2023 \(File No. 001-38942\).](#)
- 10.28** [Credit Agreement dated April 21, 2023, by and between Arcturus Therapeutics, Inc. and Wells Fargo Bank, National Association. Incorporated by reference to Exhibit 10.28 to Quarterly Report on Form 10-Q filed on May 9, 2023 \(File No. 001-38942\).](#)
- 10.29** [Security Agreement dated April 21, 2023, by and between Arcturus Therapeutics, Inc. and Wells Fargo Bank, National Association. Incorporated by reference to Exhibit 10.29 to Quarterly Report on Form 10-Q filed on May 9, 2023 \(File No. 001-38942\).](#)
- 10.30** [Revolving Line of Credit Note dated April 21, 2023, by and between Arcturus Therapeutics, Inc. and Wells Fargo Bank, National Association. Incorporated by reference to Exhibit 10.30 to Quarterly Report on Form 10-Q filed on May 9, 2023 \(File No. 001-38942\).](#)
- 10.31** * [Amendment Number One to Collaboration and License Agreement, dated August 3, 2023, by and between Arcturus Therapeutics, Inc. and Seqirus Inc.](#)

- 10.32** * [Amendment No. 4 to Letter Agreement, dated September 25, 2023, by and between Arcturus Therapeutics, Inc. and the Cystic Fibrosis Foundation.](#)
- 31.1* [Certification of Principal Executive Officer Pursuant to Rule 13a-14\(a\) or 15d-14\(a\) under the Securities Exchange Act of 1934, as amended.](#)
- 31.2* [Certification by Principal Financial Officer pursuant to Rule 13a-14\(a\) or 15d-14\(a\) under the Securities Exchange Act of 1934, as amended.](#)
- 32.1* [Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.](#)
- 32.2* [Certification of Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.](#)
- 101* The following financial statements and footnotes from the Registrant’s Quarterly Report on Form 10-Q for the fiscal quarter ended September 30, 2023 formatted in Inline Extensible Business Reporting Language (Inline XBRL):
101.INS Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document
101.SCH Inline XBRL Taxonomy Extension Schema
101.CAL Inline XBRL Taxonomy Extension Calculation Linkbase
101.DEF Inline XBRL Taxonomy Extension Definition Linkbase
101.LAB Inline XBRL Taxonomy Extension Label Linkbase
101.PRE Inline XBRL Taxonomy Extension Presentation Linkbase
- 104 Cover Page Interactive Data File (embedded within the Inline XBRL document)

* Filed herewith.

** Certain confidential portions of this exhibit have been redacted from the publicly filed document because such portions are (i) not material and (ii) would be competitively harmful if publicly disclosed.

† Management compensatory plan, contract or arrangement.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

ARCTURUS THERAPEUTICS HOLDINGS INC.

Date: November 14, 2023

By: /s/ Andy Sassine
Andy Sassine
Chief Financial Officer

REDACTED

Certain identified information, indicated by [***], has been excluded from the exhibit because it is both (i) not material and (ii) would likely cause competitive harm if publicly disclosed.

AMENDMENT NUMBER ONE

TO COLLABORATION AND LICENSE AGREEMENT

This Amendment Number One to Collaboration and License Agreement (this “**Amendment**”) is made and entered into on August 3, 2023 (the “**Amendment Effective Date**”) and amends the Collaboration Agreement by and between Arcturus Therapeutics, Inc., a Delaware corporation (“**Arcturus**”), and Seqirus Inc., a Delaware corporation (“**Seqirus**”). Arcturus and Seqirus are sometimes referred to herein individually as a “**Party**” and together as the “**Parties**.” Capitalized terms used in this Amendment that are not defined herein shall have the meanings ascribed to such terms in the Collaboration Agreement.

RECITALS

WHEREAS, Arcturus and Seqirus are parties to that certain Collaboration and License Agreement (“**Collaboration Agreement**”) executed on November 1, 2022 and with an effective date of December 8, 2022 (the “**Collaboration Agreement Effective Date**”); and

WHEREAS, the Parties desire that Arcturus sponsor and have conducted a Phase 1 clinical study in the Influenza Field as further described herein, and the Parties desire to set forth payment obligations of Seqirus in connection therewith;

NOW, THEREFORE, in consideration of the premises and the mutual promises and conditions hereinafter set forth, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, intending to be legally bound, do hereby agree as follows:

1. **Definitions.** The following definitions are hereby added to Article 1 of the Collaboration Agreement:

1.1 “**Influenza Phase I Development Plan**” means a development plan setting forth in reasonable detail specific Development activities, to be performed with respect to the Vaccine Candidates or Vaccine Products in the Influenza Field in connection with Phase I Study(ies), [***], the [***], the [***], and the [***] for [***]. [***].

1.2 “**Influenza Phase I Study**” means the Phase I Study [***] described in the Influenza Phase I Study Protocol. The Influenza Phase I Study may be modified only by mutual written agreement of the Parties.

1.3 “**Influenza Phase I Study Activities**” has the meaning set forth in Section 3.2.7 of this Agreement.

1.4 “**Influenza Phase I Study Budget**” means the [***].

1.5 “**Influenza Phase I Study Protocol**” means the [***].

1.6 “**Start Up Agreement**” means [***].

2. **JDC Specific Responsibilities.** The [***] is hereby added to [***] of the Collaboration Agreement after [***] , and [***] is hereby added to [***] of the Collaboration Agreement after [***].

3. **Influenza Phase I Study Activities.** The following section is hereby added as new Section 3.2.7 of the Collaboration Agreement:

3.2.7. Influenza Field Phase 1 Study.

(i) Arcturus will use Commercially Reasonable Efforts to act as the sponsor of the Influenza Phase I Study and to undertake additional related activities assigned to Arcturus as outlined in the Influenza Phase I Development Plan (collectively, the “**Influenza Phase I Study Activities**”). Influenza Phase I Study Activities include [***], [***], [***], and [***] pre-clinical and [***] do not include (i) [***], (ii) [***], [***].

(ii) The Parties shall review and mutually agree on any updates to the [***] . The JDC shall review [***] covering [***] at least [***] for the purpose of considering appropriate amendments thereto. In addition, either Party, through its representatives on the JDC, may propose amendments to [***] for [***] at any time.

4. **Development Milestone Payments for Influenza Phase I Study Activities.** The following is hereby added as new Sections 6.3.2(viii)-(x) of the Collaboration Agreement:

6.3.2(viii) Upon execution of the Start Up Agreement, Seventeen Million Five Hundred Thousand Dollars (\$17,500,000) (“**Payment One**”);

6.3.2(ix) Upon [***], [***], or [***] (such amount, “**Payment Two**”); provided for clarity that, for purposes of such calculation, [***] may apply any [***] permitted to be applied for up to and [***], subject to [***];

6.3.2(x) Upon completion of [***], [***], or [***] (such amount, “**Payment Three**”); and

6.3.2(xi) Upon completion of [***], [***], or [***] (such amount, “**Payment Four**”). If clause (ii) exceeds clause (i), then such amount shall be [***].

5. **Start Up Agreement Milestone.** The Parties acknowledge that the milestone set forth in Section 6.3.2(viii) for Payment One was met on June 12, 2023, which was the date of execution of the Start Up Agreement. Seqirus shall make Payment One on or before August 11, 2023.

6. **R&D Credit.** Section 3.6.3 of the Collaboration Agreement is hereby amended and replaced in its entirety with the following:

“3.6.3 **R&D Credit.** [***] will provide [***] with [***] in credit (“[***]”) toward [***] conducted during the [***]. [***] will allocate the [***] as it deems necessary to fulfill the

activities set forth in the [***] or the [***] (but, for the avoidance of doubt, not as a credit against any milestone payments except for the [***] set forth in [***]; provided, however, that [***] may [***] up to (i) [***] against [***] payable [***] and [***], (ii) [***] of [***] against [***] payable [***] and (iv) [***] of [***] against [***] for [***]. If any [***] is [***] at [***] it will be [***] to [***], until [***] at which time [***].”

7. **Defined Term “Plan”.** The definition of “Plan” is hereby amended and replaced in its entirety with the following:

“**Plan**” means a [***].

8. **Miscellaneous.**

8.1 **Effect.** Except as specifically amended by this Amendment, all of the terms and conditions of the Collaboration Agreement shall remain in full force and effect, and this Amendment shall be read together and construed as one with the Collaboration Agreement.

8.2 **Conflicts.** In the event of a conflict between a provision of the Collaboration Agreement and a provision of this Amendment, the provisions of this Amendment will control to the extent of such conflict.

8.3 **Counterparts.** This Amendment may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Counterparts may be signed or delivered by facsimile or electronically scanned signature page.

[SIGNATURE PAGE FOLLOWS.]

THIS AMENDMENT IS EXECUTED by the authorized representatives of the Parties as of the Amendment Effective Date.

ARCTURUS THERAPEUTICS, INC.

SEQIRUS, INC.

By:

By:

Name: Joseph E. Payne

Name: Jonathan Kegerise

Title: President and CEO

Title: President

SEQIRUS, INC.

By:

Name: Melissa Puryear

Title: Secretary

Attachment 1.1 to the Amendment

[*]**

Attachment A to [*]**

[***]

[***]

Attachment B to [*]**

[***]

[***]

Attachment 1.6 to [*]**

[***]

[***]

Certain identified information, indicated by [***], has been excluded from the exhibit because it is both (i) not material and (ii) would likely cause competitive harm if publicly disclosed.

AMENDMENT NO. 4 TO LETTER AGREEMENT

This Amendment No. 4 (“**Amendment No. 4**”) to the Development Program Letter Agreement of May 16, 2017, as amended on July 13, 2018, July 30, 2019 and December 21, 2021 (as amended, the “**Agreement**”), is entered into and effective as of September 25, 2023 (the “**Amendment No. 4 Effective Date**”) by and between Arcturus Therapeutics, Inc. (“**Arcturus**”) and the Cystic Fibrosis Foundation (“**CFF**”). Capitalized terms used but not defined herein have the meanings given to them in the Agreement.

WHEREAS, Arcturus and CFF are parties to the Agreement; and

WHEREAS, Arcturus intends to conduct additional work to develop and test its development candidate ARCT-032, as described on Exhibit A-4 attached hereto (the “**Additional Research Plan**”), and has requested that the CFF provide additional funding to support the Additional Research Plan; and

WHEREAS, CFF desires to provide up to an additional \$9,000,000 on the terms and conditions contained in the Agreement and this Amendment No. 4;

NOW, THEREFORE, in consideration of the mutual covenants set forth in the Agreement and this Amendment No. 4 and for other good and valuable consideration, the receipt and sufficiency of which the parties acknowledge, the parties agree as follows:

1. Increased Award. The “Amount of Award” specified in the Agreement is hereby increased by \$9,000,000 (the “**Increased Award Amount**”) for a total of \$24,583,796. The Increased Award Amount shall be disbursed directly to Arcturus in accordance with the Payment Schedule attached hereto as Exhibit B-4. Arcturus shall use the Increased Award Amount to fund the following elements of the Additional Research Plan: (i) [***]; (ii) [***]; (iii) [***]; and (iv) [***] ([***) [***].
2. Amendment to Section 2 of the Agreement - Financials. Section 2 of the Agreement is hereby deleted in its entirety and the following inserted in lieu thereof:

“2. **Financials**.

2.1 Royalties. In consideration of CFF’s Award under this Agreement and CFF’s license and transfer of intellectual property and CFF Know-How pursuant to this Agreement, Arcturus shall pay to CFF the following royalties (“**Royalties**”):

- (a) (i) [***]% of Net Sales of CF Products and the [***] approved for [***] (collectively “**Covered Products**”) in [***] until such Royalties [***] ([***) times the Actual Award (“[***]”), and then [***]% of such Net Sales thereafter; and
-

(ii) [***]% of Net Sales of Covered Products in [***], collectively, until such Royalties reach [***] the [***] (“[***]”), and then [***]% of such Net Sales thereafter;

provided, however, that in the event that Covered Products are sold by a sublicensee of Arcturus, then for purposes of determining Royalties due up to the [***] or [***], such Royalties shall be based on [***]% of amounts received by Arcturus based on such Net Sales by the sublicensee;

provided, however, that once the Royalties on Net Sales of Covered Products collectively reach [***] the Actual Award[***], Arcturus may opt to reduce the royalty rate on such Net Sales to [***] by notifying CFF thereof and paying CFF an amount equal to [***];

provided further, that the applicable royalty rate specified above shall no longer be applicable in a country with respect to each CF Product or Pulmonary Product individually after the latest to occur of the following: (X) [***]; (Y) [***]; and (Z) [***].

- (b) For Products that are neither Covered Products nor OTC Products and that are approved for therapeutic (and not prophylactic or preventive) use and commercial sale in any country, [***] of [***], until such Royalties cumulatively reach [***].
- (c) Royalties shall be reduced proportionately if CFF’s Actual Award is less than the full Amount of Award by multiplying the respective percentages set forth in this Section 2.1 by a [***], and [***].

2.2 Disposition Payments.

- (a) In the event of a license, sale or other transfer of a Covered Product or Arcturus Development Program Technology (excluding Net Sales and any Change of Control Transaction) (a “**Licensing Transaction**”), Arcturus and/or its shareholders shall pay to CFF [***] of [***] up to [***] the [***]. For avoidance of doubt, such consideration shall include upfront payments, milestone payments and royalties, whether paid in cash or other property (including equity), but shall not include payments made at fair market value for the performance of research or development activities.
- (b) In the event of a Change of Control Transaction, Arcturus shall pay to CFF [***] of [***]; provided that such payment amount shall not exceed [***]. For avoidance of doubt, such consideration shall be calculated based on all upfront payments, milestone payments and payments under contingent rights, if applicable; provided, for clarity, that if the consideration paid to Arcturus and/or its shareholders consists of equity of the acquiring company, then the payment to CFF may be paid in cash or equity, at the election of the acquiror, with the equity valued at the closing price on the closing date of the Change of Control Transaction.
- (c) Each payment paid by Arcturus pursuant to Section 2.2(a) and Section 2.2(b) is a “**Disposition Payment**”.
- (d) Any Disposition Transaction that is an asset sale or transfer, or a Change of Control Transaction, shall be null and void unless the third-party transferee in such transaction expressly assumes the joint and several obligation of the Royalty obligations specified in Section 2.1.

2.3 Payment Offsets.

- (a) A Disposition Payment paid pursuant to a Licensing Transaction shall offset and reduce any Disposition Payment payable pursuant to a Change of Control Transaction, and a Disposition Payment paid pursuant to a Change of Control Transaction shall offset and reduce any Disposition Payment payable pursuant to a Licensing Transaction.
- (b) All Disposition Payments paid by Arcturus shall be credited toward meeting each Royalty Threshold.
- (c) All Royalties paid by Arcturus shall offset and reduce any Disposition Payment payable pursuant to a Change of Control Transaction.
- (d) Any amounts previously paid to CFF pursuant to Section 2.1(a) (other than amounts paid toward the [***] or [***) shall reduce the amount otherwise payable to CFF under Section 2.1(b), and any amount paid to CFF pursuant to Section 2.1(b) shall reduce the amounts payable to CFF under Section 2.1(a) (other than amounts payable toward the [***] and [***)).

2.4 General

- (a) There shall be added to the Actual Award for purposes of determining the maximum payments to CFF under this Section 2 [***].
 - (b) The payments to CFF under this Section 2 shall be made within [***] following (i) [***], and (ii) in the case of [***], any payment that is received by Arcturus and/or its shareholders with respect to a Disposition Transaction.”
3. Amendment to Section 1 of the Agreement – Reports. The second sentence of Section 1(c) of the Agreement is hereby amended and restated in its entirety to read as follows: “In addition, Arcturus shall prepare and deliver to CFF a closing report within [***] after completion of each of (i) [***], and (ii) [***].”
4. Amendment to Section 12 of the Agreement – Definitions. The following definitions are hereby replaced or added as follows:
- “Disposition Transaction” means a Licensing Transaction and/or Change of Control Transaction, as the case may be.
 - “Product” means a product developed by Arcturus with Arcturus’ LUNAR platform and controlled by Arcturus (i.e., owned by Arcturus or licensed by Arcturus to a third party). “Product” may include, without limitation, CF Product, Covered Product, Pulmonary Product and/or OTC Product, as the case may be. For avoidance of doubt, in Sections 1, 3, 4, 5 and 12(a) (with respect to the definitions of “Commercially Reasonable Efforts” and “Interruption”), “Product” means a Product that is a CF Product.
 - “Royalty Threshold” means the [***], [***], [***] and/or [***], as the case may be.
5. Interruption License Procedure. CFF acknowledges that Arcturus has a significant interest in protecting the proprietary nature of its trade secret assets, including design and optimization technologies and formulation processes. Therefore, CFF will, within [***] of a grant of the

Interruption License from Arcturus, provide written notice to Arcturus of its intent to further develop the CF Product directly or indirectly. In the event that CFF does not, within [***] after a grant of the Interruption License from Arcturus, provide written notice to Arcturus certifying that CFF has determined to fund and to use commercially reasonable efforts to develop the CF Product, or has licensed the CF Product on an arms-length basis to a third party with sufficient resources to develop and commercialize the CF Product, then the Interruption License shall be deemed terminated; provided that if at the end of such [***] period the CFF is engaged in good faith negotiations with a third party regarding such a license, CFF may request an extension of this period, with Arcturus' consent not to be unreasonably withheld.

6. Exhibits. Exhibit A-4 attached hereto is hereby added to Exhibit A of the Agreement and constitutes a portion of the Development Plan referenced in the Agreement. Exhibit B-4 attached hereto is hereby added to Exhibit B of the Agreement, such that the milestone detailed therein shall be added to the master Payment Schedule of the Agreement.
7. Continuing Effect. Except as set forth in this Amendment No. 4, the Agreement shall remain in full force and effect.
8. Counterparts. This Amendment No. 4 may be executed in any number of counterparts, each of which shall be an original instrument and all of which, when taken together, shall constitute one and the same agreement.

[signature page follows]

IN WITNESS WHEREOF, the undersigned have executed this Amendment No. 4 as of the Amendment No. 4 Effective Date.

CYSTIC FIBROSIS FOUNDATION

ARCTURUS THERAPEUTICS, INC.

By: _____

By: _____

Name: _____

Name: _____

Title: _____

Title: _____

Exhibit A-4

[***]

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**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

The undersigned, the President and Chief Executive Officer of Arcturus Therapeutics Holdings Inc. (the "Company"), hereby certifies on the date hereof, pursuant to 18 U.S.C. 1350(a), as adopted pursuant to Section 906 of The Sarbanes-Oxley Act of 2002, that the Quarterly Report on Form 10-Q for the period ended September 30, 2023 (the "Form 10-Q"), filed concurrently herewith by the Company, fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, and that the information contained in the Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: November 14, 2023

By: _____ /s/ Joseph E. Payne
Joseph E. Payne
President and Chief Executive Officer
