# 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 June 30, 2021**

**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**<br>**(State or other jurisdiction of incorporation or organization)** | **32-0595345**<br>**(I.R.S. Employer Identification No.)** |
| **10628 Science Center Drive, Suite 250**<br>**San Diego, California**<br>**(Address of principal executive offices)** | **92121**<br>**(Zip Code)** |

**Registrant's telephone number, including area code: (858) 900-2660**

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

| Title of each class | Trading Symbol(s) | Name of each exchange on which registered |
|---|---|---|
| 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 | ☒ | Accelerated filer | ☐ |
| Non-accelerated filer | ☐ | Smaller reporting company | ☐ |
| Emerging growth company | ☐ | | |

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 August 5, 2021, the registrant had 26,327,077 shares of voting common stock outstanding.

**ARCTURUS THERAPEUTICS HOLDINGS INC. AND ITS SUBSIDIARIES**

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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 "forward-looking statements" within the meaning of the federal securities laws 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. Such statements may include, but are not limited to, statements concerning the following:

- the initiation, 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;
- 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 ability to obtain and deploy funding for our operations;
- our ability to continue as a going concern;
- our plans to research, develop and commercialize our product candidates;
- 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, joint ventures and other third parties;
- 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 maintain intellectual property protection for our product candidates;
- the size and growth potential of the markets for our product candidates, and our ability to serve those markets;
- 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;
- our ability to develop sales and marketing capabilities, whether alone or with potential future collaborators;
- regulatory developments in the United States and foreign countries;
- our ability to attract and retain experienced and seasoned scientific and management professionals;
- our ability to identify and consummate arrangements with strategic partners or foreign governments to defray the costs of clinical trials for our product candidates;
- our ability to establish, maintain and scale-up manufacturing operations, including those of our contract manufacturers;
- the performance of our third-party suppliers and manufacturers;
- the success of competing therapies that are or may become available; and
- the accuracy of our estimates regarding future expenses, future revenues, capital requirements and need for additional financing.

Such forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause actual results or performance to differ materially from those projected. These 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 the same in light of additional research, preclinical and clinical trial results. 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 SEC. Readers are cautioned

not to place undue reliance on these forward-looking statements, which speak only as of the date hereof. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, levels of activity, performance, or achievements. Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future.

## 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)

| | June 30, 2021 (unaudited) | December 31, 2020 |
|---|---|---|
| **Assets** | | |
| **Current assets:** | | |
| Cash and cash equivalents | $ 433,574 | $ 462,895 |
| Accounts receivable | 2,163 | 2,125 |
| Prepaid expenses and other current assets | 2,301 | 2,769 |
| **Total current assets** | 438,038 | 467,789 |
| Property and equipment, net | 3,407 | 3,378 |
| Operating lease right-of-use asset, net | 6,341 | 5,182 |
| Equity-method investment | 920 | — |
| Non-current restricted cash | 107 | 107 |
| **Total assets** | $ 448,813 | $ 476,456 |
| **Liabilities and stockholders' equity** | | |
| **Current liabilities:** | | |
| Accounts payable | $ 10,084 | $ 10,774 |
| Accrued liabilities | 42,614 | 20,639 |
| Deferred revenue | 18,071 | 18,108 |
| **Total current liabilities** | 70,769 | 49,521 |
| Deferred revenue, net of current portion | 9,850 | 12,512 |
| Long-term debt, net of current portion | 56,309 | 13,845 |
| Operating lease liability, net of current portion | 5,359 | 4,025 |
| Other long-term liabilities | 878 | — |
| **Total liabilities** | $ 143,165 | $ 79,903 |
| **Stockholders' equity** | | |
| Common stock: $0.001 par value; 60,000 shares authorized; 26,327 issued and outstanding at June 30, 2021 and 26,192 issued and outstanding at December 31, 2020 | 26 | 26 |
| Additional paid-in capital | 560,365 | 540,343 |
| Accumulated deficit | (254,743) | (143,816) |
| **Total stockholders' equity** | 305,648 | 396,553 |
| **Total liabilities and stockholders' equity** | $ 448,813 | $ 476,456 |

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 June 30, | | Six Months Ended June 30, | |
|---|---|---|---|---|
| | 2021 | 2020 | 2021 | 2020 |
| **Collaboration revenue** | $ 2,001 | $ 2,322 | $ 4,128 | $ 4,968 |
| **Operating expenses:** | | | | |
| Research and development, net | 45,679 | 7,944 | 95,729 | 15,861 |
| General and administrative | 10,042 | 4,420 | 19,785 | 8,611 |
| Total operating expenses | 55,721 | 12,364 | 115,514 | 24,472 |
| Loss from operations | (53,720) | (10,042) | (111,386) | (19,504) |
| (Loss) gain from equity-method investment | (328) | (100) | 920 | (263) |
| (Loss) gain from foreign currency | (13) | — | 417 | — |
| Finance expense, net | (520) | (121) | (878) | (273) |
| Net loss | $ (54,581) | $ (10,263) | $ (110,927) | $ (20,040) |
| Net loss per share, basic and diluted | $ (2.07) | $ (0.55) | $ (4.22) | $ (1.20) |
| Weighted-average shares outstanding, basic and diluted | 26,323 | 18,794 | 26,284 | 16,657 |
| Comprehensive loss: | | | | |
| Net loss | $ (54,581) | $ (10,263) | $ (110,927) | $ (20,040) |
| Comprehensive loss | $ (54,581) | $ (10,263) | $ (110,927) | $ (20,040) |

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

**Three Months Ended June 30, 2021**

| | Common Stock Shares | Common Stock Amount | Additional Paid-In Capital | Accumulated Deficit | Total Stockholders' Equity |
|---|---|---|---|---|---|
| **BALANCE – March 31, 2021** | **26,319** | **$ 26** | **$ 552,743** | **$ (200,162)** | **$ 352,607** |
| Net loss | — | — | — | (54,581) | (54,581) |
| Share-based compensation expense | — | — | 7,540 | — | 7,540 |
| Issuance of common stock upon exercise of stock options | 8 | — | 82 | — | 82 |
| **BALANCE – June 30, 2021** | **26,327** | **$ 26** | **$ 560,365** | **$ (254,743)** | **$ 305,648** |

**Three Months Ended June 30, 2020**

| | Common Stock Shares | Common Stock Amount | Additional Paid-In Capital | Accumulated Deficit | Total Stockholders' Equity |
|---|---|---|---|---|---|
| **BALANCE – March 31, 2020** | **15,157** | **$ 15** | **$ 98,412** | **$ (81,445)** | **$ 16,982** |
| Net loss | — | — | — | (10,263) | (10,263) |
| Issuance of common stock, net of issuance costs | 4,735 | 5 | 75,300 | — | 75,305 |
| Issuance of common stock to Ultragenyx on option exercise | 600 | 1 | 9,599 | — | 9,600 |
| Issuance of common stock upon exercise of stock options | 118 | — | 698 | — | 698 |
| Share-based compensation expense | — | — | 1,101 | — | 1,101 |
| **BALANCE – June 30, 2020** | **20,610** | **$ 21** | **$ 185,110** | **$ (91,708)** | **$ 93,423** |

**Six Months Ended June 30, 2021**

| | Common Stock Shares | Common Stock Amount | Additional Paid-In Capital | Accumulated Deficit | Total Stockholders' Equity |
|---|---|---|---|---|---|
| **BALANCE – December 31, 2020** | **26,192** | **$ 26** | **$ 540,343** | **$ (143,816)** | **$ 396,553** |
| Net loss | — | — | — | (110,927) | (110,927) |
| Issuance of common stock related to acquired in-process research and development | 75 | — | 5,000 | — | 5,000 |
| Share-based compensation expense | — | — | 14,527 | — | 14,527 |
| Issuance of common stock upon exercise of stock options | 60 | — | 495 | — | 495 |
| **BALANCE – June 30, 2021** | **26,327** | **$ 26** | **$ 560,365** | **$ (254,743)** | **$ 305,648** |

**Six Months Ended June 30, 2020**

| | Common Stock Shares | Common Stock Amount | Additional Paid-In Capital | Accumulated Deficit | Total Stockholders' Equity |
|---|---|---|---|---|---|
| **BALANCE – December 31, 2019** | **15,138** | **$ 15** | **$ 97,445** | **$ (71,668)** | **$ 25,792** |
| Net loss | — | — | — | (20,040) | (20,040) |
| Issuance of common stock, net of issuance costs | 4,735 | 5 | 75,300 | — | 75,305 |
| Issuance of common stock to Ultragenyx on option exercise | 600 | 1 | 9,599 | — | 9,600 |
| Issuance of common stock upon exercise of stock options | 137 | — | 816 | — | 816 |
| Share-based compensation expense | — | — | 1,950 | — | 1,950 |
| **BALANCE – June 30, 2020** | **20,610** | **$ 21** | **$ 185,110** | **$ (91,708)** | **$ 93,423** |

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

| | Six Months Ended June 30, | |
|---|---|---|
| | **2021** | **2020** |
| **OPERATING ACTIVITIES:** | | |
| Net loss | $ (110,927) | $ (20,040) |
| ***Adjustments to reconcile net loss to net cash used in operating activities:*** | | |
| Depreciation and amortization | 594 | 394 |
| Share-based compensation expense | 14,527 | 1,950 |
| Acquired in-process research and development expense | 5,000 | — |
| (Gain) loss from equity-method investment | (920) | 263 |
| Foreign currency transaction gain | (417) | — |
| Other non-cash expenses | 1,583 | 654 |
| ***Changes in operating assets and liabilities*** | | |
| Accounts receivable | (38) | (650) |
| Prepaid expense and other assets | 468 | (2,302) |
| Accounts payable | (791) | (1,442) |
| Accrued liabilities | 17,727 | 3,619 |
| Deferred revenue | (2,699) | (2,798) |
| **Net cash used in operating activities** | (75,893) | (20,352) |
| **INVESTING ACTIVITIES:** | | |
| Acquisition of property and equipment | (522) | (611) |
| **Net cash used in investing activities** | (522) | (611) |
| **FINANCING ACTIVITIES:** | | |
| Proceeds from debt | 46,599 | — |
| Proceeds from issuance of common stock, net of issuance costs | — | 75,305 |
| Proceeds from the issuance of common stock to Ultragenyx on option exercise | — | 9,600 |
| Proceeds from exercise of stock options | 495 | 816 |
| **Net cash provided by financing activities** | 47,094 | 85,721 |
| NET (DECREASE) INCREASE IN CASH, CASH EQUIVALENTS AND RESTRICTED CASH | (29,321) | 64,758 |
| Cash, cash equivalents and restricted cash at beginning of the period | 463,002 | 71,460 |
| Cash, cash equivalents and restricted cash at end of the period | $ 433,681 | $ 136,218 |

| | Six Months Ended June 30, | |
|---|---|---|
| | **2021** | **2020** |
| **Supplemental disclosure of cash flow information** | | |
| Cash paid for interest | $ 173 | $ 180 |
| **Non-cash investing activities** | | |
| Right-of-use asset obtained in exchange for lease liabilities | $ 1,828 | $ 674 |
| Acquisition of in-process research and development through issuance of common stock | $ 5,000 | $ — |
| Purchase of property and equipment in accounts payable | $ 101 | $ 44 |

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

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

### Description of Business

Arcturus Therapeutics Holdings Inc. (the "Company") is a global clinical-stage messenger RNA medicines company focused on development of infectious disease vaccines and significant 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 was deemed allowed to proceed by the U.S. Food and Drug Administration ("FDA"), and its Clinical Trial Application ("CTA") candidate LUNAR-COV19 was approved to proceed by the Singapore Health Sciences Authority.

### Basis of Presentation

The accompanying condensed consolidated financial statements include the accounts of Arcturus Therapeutics Holdings Inc. 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 financial statements and footnotes included in the Company's Annual Report on Form 10-K for the year ended December 31, 2020.

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 a 49% joint venture with Axcelead, Inc. (see the following paragraph for further details) and a 12% ownership in Vallon Pharmaceuticals, Inc. (see "*Note 10, Related Party Transactions"* for further details). 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.

In April 2021, Arcturus and Axcelead, Inc., a company existing under the laws of Japan ("Axcelead"), formed a joint venture entity, named Arcalis, Inc. ("JV Entity"), which operates as a corporation under the laws of Japan. Axcelead is an integrated drug discovery solutions provider to the pharmaceutical industry in Japan, having succeeded to a portion of the drug discovery research department of Takeda Pharmaceutical Company Limited on July 1, 2017. The goal of the joint venture entity is to be a contract development and manufacturing organization focused on mRNA manufacturing that would provide manufacturing services to the Company and also to third parties. The joint venture includes a shareholders agreement setting forth initial funding of the JV Entity and rights of the shareholders, including certain approval rights of Arcturus. As part of the joint venture, the Company entered into a License and Technology Transfer Agreement with the JV Entity, pursuant to which Arcturus grants to JV Entity a nonexclusive license to certain intellectual property for use at the JV Entity's facilities, and obligates Arcturus to conduct certain technology transfer activities.

The Company consolidates variable interest entities ("VIEs") where it has been determined that the Company is the primary beneficiary of those entities' operations. Management believes that power is shared between Arcturus and Axcelead, as unrelated parties. The consent of each of the parties is substantive and is required to make the decisions about the JV Entity's significant activities. Management does not believe that Arcturus has the power to direct the activities of the JV Entity that most significantly impact the JV Entity's economic performance. Therefore, the Company concluded it is not required to consolidate the JV Entity under the VIE model.

The equity method of accounting is applicable for the JV Entity as the Company does not own more than 50% of voting power, but has influence over the operation and financial policies of the investee. The Company will account for its investment in the JV Entity using the equity method of accounting as specified in ASC 323, *Investments — Equity Method and Joint Ventures*. Under ASC 323, equity method investments are recorded initially at cost. The Company's initial investment in the JV Entity totaled $9.2 million. However, Arcalis paid the Company back the initial investment of $9.2 million as an upfront fee/consideration for the License and Technology Transfer Agreement. In substance, there was no cash consideration paid by the Company for its 49% equity interest in the JV Entity. After this initial measurement, an equity method investment is adjusted at each reporting period to recognize the investor's share of the earnings, losses and/or changes in capital of the investee after the date of acquisition. Losses are only recognized to the extent the value of the investment is greater than zero.

**Liquidity**

The Company has incurred significant operating losses since its inception. As of June 30, 2021 and December 31, 2020, the Company had an accumulated deficit of $254.7 million and $143.8 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 June 30, 2021, the Company has funded its operations principally with the sale of capital stock, revenues earned through collaboration agreements, and proceeds from long-term debt. During the first quarter of 2021, the Company elected to borrow and the Economic Development Board of the Republic of Singapore (the "EDB") agreed to make a term loan of S$62.1 million (approximately USD$46.6 million) to support the manufacture of the LUNAR-COV19 vaccine candidate. Additionally, through underwritten public offerings during fiscal year 2020, the Company raised net proceeds of $423.8 million, after deducting underwriting discounts, commissions, and offering expenses.

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**

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision-maker in making decisions regarding resource allocation and assessing performance. 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**

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 collaborative research and development agreements include license fees, upfront payments, milestone payments, and reimbursement for research and development activities, option exercise 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.

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

**Leases**

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

**Research and Development, 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 receipt of goods or services to be used in research and development are capitalized until the goods or services are received.

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 site costs related to patient enrollment are accrued as patients enter and progress through the trial.

**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, 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.

**Statement 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) | June 30, 2021 | June 30, 2020 |
|---|---|---|
| Cash and cash equivalents | $ 433,574 | $ 136,111 |
| Non-current restricted cash | 107 | 107 |
| Total cash, cash equivalents and restricted cash shown in the statement of cash flows | $ 433,681 | $ 136,218 |

**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. Dilutive shares of common stock are comprised of stock options.

No dividends were declared or paid during the reported periods.

**Note 2. Collaboration Revenue**

The Company has entered into license agreements and collaborative research and development arrangements with pharmaceutical and biotechnology companies. Under these arrangements, the Company is entitled to receive license 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.

The following table presents changes during the six months ended June 30, 2021 in the balances of contract assets, including receivables from collaborative partners, and contract liabilities, including deferred revenue, as compared to what was disclosed in the Company's Annual Report.

| (in thousands) | Contract Assets |
|---|---|
| BALANCE - December 31, 2020 | $ 2,125 |
| Additions for revenue recognized from billings | 1,429 |
| Deductions for cash collections | (1,391) |
| BALANCE – June 30, 2021 | $ 2,163 |

| (in thousands) | Contract Liabilities |
|---|---|
| BALANCE - December 31, 2020 | $ 30,620 |
| Additions for advanced billings | 1,429 |
| Deductions for promised services provided in current period | (4,128) |
| BALANCE – June 30, 2021 | $ 27,921 |

The following table summarizes the Company's collaboration revenues for the periods indicated (in thousands).

| | For the Three Months Ended June 30, | | For the Six Months Ended June 30, | |
|---|---|---|---|---|
| (Dollars in thousands) | 2021 | 2020 | 2021 | 2020 |
| Collaboration Partner – Janssen | $ 769 | $ 693 | $ 1,593 | $ 1,590 |
| Collaboration Partner – Ultragenyx | 925 | 913 | 1,850 | 1,824 |
| Collaboration Partner – CureVac | 247 | 231 | 472 | 540 |
| Collaboration Partner – Other | 60 | 485 | 213 | 1,014 |
| Total collaboration revenue | $ 2,001 | $ 2,322 | $ 4,128 | $ 4,968 |

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

*Collaboration Partner – Janssen*

In October 2017, the Company entered into a research collaboration and license agreement with Janssen (the "2017 Agreement") to collaborate on developing candidates for treating HBV with RNA therapeutics. The 2017 Agreement allocated discovery, development, funding obligations, and ownership of related intellectual property among the Company and Janssen Pharmaceuticals, Inc. ("Janssen"). The Company received an upfront payment of $7.7 million and may receive preclinical, development and sales milestone payments of up to $56.5 million, as well as royalty payments on any future licensed product sales. The next potential milestone to be achieved relates to demonstrating *in vivo* efficacy and safety. Janssen began reimbursing the Company for research costs during the first quarter of 2019 upon the completion of the first of three research periods. Janssen will pay royalties as a low to mid-single digit percentage of net sales of licensed products, subject to reduction on a country-by-country and licensed-product-by-licensed-product basis and subject to certain events, such as expiration of program patents. In addition, the 2017 Agreement includes an exclusivity period.

In evaluating the 2017 Agreement in accordance with Accounting Standards Codification ("ASC") Topic 606, the Company concluded that the contract counterparty, Janssen, is a customer. The Company identified the following promised goods/services as of the inception of the 2017 Agreement: (i) research services, (ii) license to use Arcturus technology and (iii) participation in a joint research committee. The Company concluded that the promised goods/services are incapable of being distinct and consequently do not have any value on a standalone basis. Accordingly, they are determined to represent a single performance obligation. The Company concluded that Janssen's options to select additional collaboration targets and to license rights to selected targets are not priced at a discount and therefore do not represent performance obligations for which the transaction price would be allocated.

As of June 30, 2021, the remaining transaction price consisting of upfront consideration received and budgeted reimbursable out-of-pocket costs, is expected to be recognized using an input method over the remaining research period of 15 months. None of the development and commercialization milestones were included in the transaction price as they are outside the control of the Company and contingent upon success in future clinical trials and the collaborator's efforts. Any consideration related to sales-based royalties will be recognized when the related sales occur, provided that the reported sales are reliably measurable, and the Company has no remaining promised goods/services, as such sales were determined to relate predominantly to the license granted to Janssen and therefore have also been excluded from the transaction price.

Total deferred revenue as of June 30, 2021 and December 31, 2020 for Janssen was $5.8 million and $5.9 million, respectively.

*Collaboration Partner – Ultragenyx*

In October 2015 the Company entered into a research collaboration and license agreement with Ultragenyx (the "Ultragenyx Agreement"), whereby Arcturus granted to Ultragenyx a co-exclusive license to certain Arcturus technology, which is in effect only during the reserve target exclusivity term as discussed in the following paragraphs. This collaboration agreement was amended in 2017, 2018 and during the second quarter of 2019. During the initial phase of the collaboration, the Company will design and optimize therapeutics for certain rare disease targets. Ultragenyx has the option under the Ultragenyx Agreement to add additional rare disease targets during the collaborative development period. Additionally, during the collaborative development period, the Company will participate with Ultragenyx in a joint steering committee. The Ultragenyx Agreement also includes an initial exclusivity period with an option to extend such period.

As part of the Ultragenyx Agreement and related amendments, Ultragenyx has paid $27.9 million in upfront fees, exclusivity extension fees and additional consideration. Ultragenyx also reimburses the Company for all internal and external development costs incurred. Pursuant to the Ultragenyx Agreement, Ultragenyx is required to make additional payments upon exercise of the Ultragenyx expansion option or exclusivity extension (if any) and if Ultragenyx achieves certain, clinical, regulatory and sales milestones, then the Company is eligible to receive royalty payments. For each development target for which Ultragenyx exercises its option, Ultragenyx will pay the Company a one-time option exercise fee that increases based upon the number of development targets selected by Ultragenyx and ranges from $0.5 million to $1.5 million. During the fourth quarter of 2020, Ultragenyx exercised its option to move forward with Preclinical Candidate Designation for its development target, Glycogen Storage Disease III, and paid an option fee to the Company of $0.5 million.

The current potential development, regulatory and commercial milestone payments for the existing development targets as of June 30, 2021 are $138.0 million. Ultragenyx will pay royalties as a single-digit percentage of net sales on a product-by-product and country-by-country basis during the applicable royalty term. As of June 30, 2021, Ultragenyx has not yet reached the clinical phase of the contract.

On June 18, 2019, Arcturus and Ultragenyx amended the collaboration agreement for a third time ("Amendment 3"). As part of Amendment 3, the total number of targets was increased from 10 to 12, and reserve targets will be exclusively reserved for Ultragenyx with no fees for four years after execution of the amendment. An equity component was also added as part of Amendment 3 wherein Ultragenyx purchased 2.4 million shares of common stock at a premium price. Along with the equity purchase, Ultragenyx received an option to purchase 0.6 million additional shares of common stock at $16.0 per share. In May 2020, the option was exercised.

The consideration received from Ultragenyx as a result of Amendment 3 was equal to $30.0 million and was comprised of a $24.0 million common stock purchase and a $6.0 million upfront payment. Specifically for Amendment 3, management determined the transaction price to be $14.4 million. See further discussion below regarding determining the transaction price. Management determined the fair value of the premium received by using the opening stock price subsequent to execution of Amendment 3 and applying a lack of marketability discount, as the shares received by Ultragenyx were initially restricted for up to two years. These restrictions have since expired.

In evaluating the Ultragenyx Agreement in accordance with ASC Topic 606, the Company concluded that the contract counterparty, Ultragenyx, is a customer. The Company has identified the following promised goods/services as part of the initial agreement and subsequent amendments: (i) research services, (ii) license to use Arcturus technology, (iii) exclusivity and (iv) participation in a joint steering committee. The Company concluded that the promised goods/services are incapable of being distinct and consequently do not have any value on a standalone basis. Accordingly, they are determined to represent a single performance obligation. The Company concluded that Ultragenyx's options to extend exclusivity and select additional collaboration targets and to license rights to selected targets are not priced at a discount and therefore do not represent performance obligations for which the transaction price would be allocated.

As of June 30, 2021, the transaction price included the upfront consideration received, option payments, exclusivity extension payments and additional consideration received pursuant to Amendment 3. The Company recognizes the reimbursement of labor and expenses as costs are incurred and none of the development and commercialization milestones were included in the transaction price, as all milestone amounts were fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including that the consideration is outside the control of the Company and contingent upon success in future clinical trials, approval from the FDA and the collaborator's efforts. Any consideration related to sales-based royalties will be recognized when the related sales occur as they are constrained, provided that the reported sales are reliably measurable and the Company has no remaining promised goods/services, as such sales were determined to relate predominantly to the license granted to Ultragenyx and therefore have also been excluded from the transaction price.

Amendment 3 was deemed a contract modification and accounted for as part of the original Ultragenyx Agreement. The transaction price is recognized to revenue on a straight-line basis using an input method over the 4-year reserve target exclusivity period. The reserve target exclusivity period represents the timing over which promised goods/services will be provided. Total deferred revenue at June 30, 2021 and December 31, 2020 from Ultragenyx was $7.4 million and $9.2 million, respectively.

*Collaboration Partner - CureVac*

In January 2018, the Company entered into a Development and Option Agreement (the "Development and Option Agreement") with CureVac AG ("CureVac"). Under the terms of the Development and Option Agreement, the parties agreed to conduct joint preclinical development programs once CureVac makes a payment to pull down a target on the basis of which CureVac is granted options for taking a license on pre-agreed license terms to develop and commercialize certain products incorporating the Company's patents and know-how related to LUNAR delivery technology (the "Arcturus Delivery Technology"), and CureVac patents and know-how related to mRNA technology.

Prior to expiration of the initial term of eight years (which was subsequently amended, as discussed below), the Development and Option Agreement also includes an option to extend the term on an annual basis for up to three years, subject to payment by CureVac to Arcturus of a non-refundable annual extension fee. The Development and Option Agreement includes potential milestone payments from CureVac to the Company for selected targets. The current potential milestone payments for the remaining targets as of June 30, 2021 are $14.0 million for rare disease targets and $23.0 million for non-rare disease targets. CureVac will pay royalties as a percentage of net sales on a product-by-product and country-by-country basis during the applicable royalty term in the low single-digit range. As of June 30, 2021, CureVac has not yet reached the clinical phase of the contract. Pursuant to a May 2018 amendment to the Development and Option Agreement (and as amended and restated on September 28, 2018), the Company increased the number of targets available to CureVac under the Development and Option Agreement and agreed upon the license forms to be executed upon selection of the targets by CureVac.

On July 26, 2019, the Company entered into an amendment ("CureVac Amendment") to its Development and Option Agreement with CureVac (as amended, the "Development and Option Agreement"), pursuant to which the Company and CureVac agreed to shorten the time period during which CureVac may select potential targets to be licensed from the Company from eight years to four years, and to reduce the overall number of maximum targets that may be reserved and licensed. In connection with the July 2019 CureVac Amendment, the Company and CureVac also entered into a Termination Agreement (the "Termination Agreement") terminating the January 1, 2018 Co-Development Agreement between the Company and CureVac.

In evaluating the CureVac Development and Option Agreement and Co-Development Agreement in accordance with ASC Topic 606, the Company concluded that the contract counterparty, CureVac, is a customer. The Company has identified the following promised goods/services as part of the initial agreement with CureVac and subsequent amendments: (i) research services, (ii) license to use Arcturus technology, (iii) exclusivity and (iv) participation in a joint steering committee. The Company concluded that the promised goods/services are incapable of being distinct and consequently do not have any value on a standalone basis. Accordingly, they are determined to represent a single performance obligation. The Company concluded that CureVac's options to extend the research term and options to select additional collaboration targets and to license rights to selected targets are not priced at a discount and therefore do not represent performance obligations for which the transaction price would be allocated.

As of June 30, 2021, the transaction price included the upfront consideration received. The Company recognizes the reimbursement of labor and expenses as costs are incurred and none of the development and commercialization milestones were included in the transaction price, as all milestone amounts were fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including that receipt of the milestones is outside the control of the Company and contingent upon success in future clinical trials and the collaborator's efforts. Any consideration related to sales-based royalties will be recognized when the related sales occur as they are constrained, provided that the reported sales are reliably measurable and the Company has no remaining promised goods/services, as such sales were determined to relate predominantly to the license granted to CureVac and therefore have also been excluded from the transaction price. As of June 30, 2021, no adjustments were made to the transaction price.

The upfront consideration of $5.0 million was recorded as deferred revenue in the Company's balance sheet upon receipt and is currently being recognized as revenue on a straight-line basis using an input method over the remaining 25 month contractual term as of June 30, 2021. Total deferred revenue as of June 30, 2021 and December 31, 2020 for CureVac was $1.9 million and $2.3 million, respectively.

*Other Agreements*

*Other Collaboration Revenue*

The remaining revenue from smaller collaboration agreements and material transaction agreements primarily relates to the agreement with Millennium Pharmaceuticals, Inc., a wholly owned subsidiary of Takeda Pharmaceutical Company Limited ("Takeda"). Total deferred revenue as of June 30, 2021 and December 31, 2020 for Takeda was $0.2 million and $0.4 million, respectively. The current agreement was entered into on March 18, 2019 and is expected to be completed during fiscal year 2021.

*Israeli Ministry of Health*

On August 17, 2020, the Company entered into an agreement with the Israeli Ministry of Health ("MOH") to supply the Company's COVID-19 vaccine candidate to Israel (the "Israel Supply Agreement") subject to certain conditions, including applicable regulatory approvals. In October 2020, and in association with the Israel Supply Agreement, the Company received a non-refundable payment of $12.5 million from the MOH which is included in deferred revenue as of June 30, 2021. This payment of $12.5 million is associated with a specified clinical trial milestone and serves as an initial reserve payment for a specified number of doses of the LUNAR-COV19 vaccine candidate pursuant to the Israel Supply Agreement. As a result of the making of this payment, the MOH became bound to purchase an initial quantity of 500,000 reserved vaccine doses, as set forth in and subject to the terms and conditions of the Israel Supply Agreement.

**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 establishes 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, and accrued liabilities approximate their respective fair values due to their relative short maturities. The carrying amounts of long-term debt for the amount drawn on the Company's debt facility approximates fair value as the interest rate is variable and reflects current market rates.

As of June 30, 2021 and December 31, 2020, 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 as of June 30, 2021 and December 31, 2020 consisted of the following:

| (in thousands) | June 30, 2021 | December 31, 2020 |
|---|---|---|
| Research equipment | $ 6,162 | $ 5,539 |
| Computers and software | 284 | 284 |
| Office equipment and furniture | 574 | 574 |
| Leasehold improvements | 44 | 44 |
| Total | 7,064 | 6,441 |
| Less accumulated depreciation and amortization | (3,657) | (3,063) |
| Property and equipment, net | $ 3,407 | $ 3,378 |

Depreciation and amortization expense was $0.3 million and $0.2 million for the three months ended June 30, 2021 and 2020, respectively, and $0.6 million and $0.4 million for the six months ended June 30, 2021 and 2020, respectively.

Accrued liabilities consisted of the following as of June 30, 2021 and December 31, 2020:

| (in thousands) | June 30, 2021 | December 31, 2020 |
|---|---|---|
| Accrued compensation | $ 5,524 | $ 2,097 |
| Cystic Fibrosis Foundation Liability (Note 9) | 5,036 | 6,585 |
| Singapore Economic Development Board liability | — | 1,761 |
| Vinbiocare deposit | 10,000 | — |
| Current portion of operating lease liability | 1,430 | 1,630 |
| Current portion of long-term debt | 5,000 | 1,250 |
| Clinical accruals | 7,717 | 4,067 |
| Other accrued research and development expenses | 7,907 | 3,249 |
| Total | $ 42,614 | $ 20,639 |

**Note 5. Debt**

*Manufacturing Supply 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 of S$62.1 million to the Company, subject to the satisfaction of customary deliveries, to support the manufacture of the LUNAR-COV19 vaccine candidates (the "Singapore Loan"). In June 2021, the EDB agreed to amend the Singapore Loan. The amendment includes certain loan covenants requiring (i) unused funds as of March 31, 2022 to be subsequently returned within thirty days, subject to any further agreed upon extension of the reconciliation date, (ii) the Company to provide a quarterly reconciliation report within forty-five days of each financial quarter end, (iii) an external audit of expenses paid through June 30, 2021 to be completed by September 30, 2021, and a projection of expenditures through March 31, 2022 followed by an audited statement of actual expenditures through March 31, 2022 by June 30, 2022, (iv) the Company to deliver 10 grams of LUNAR-COV19 vaccine candidate suitable for use in a phase 3 trial in two shipments with a partial shipment by June 30, 2022 and a remaining shipment by September 30, 2022, (v) the Company to provide EDB with a right of first refusal on GMP manufacturing slots of the LUNAR-COV19 vaccine candidate up to an agreed-upon maximum amount, (vi) and the obligation to repay the Singapore Loan will be secured by an interest in the raw materials and manufacturing equipment purchased by the Company with the funds from the Singapore Loan in form and substance satisfactory to the EDB in its sole discretion. 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.

The Singapore Loan accrues interest at a rate of 4.5% per annum calculated on a daily basis. Subject to certain exceptions, the Singapore Loan is intended to be a limited recourse loan that will be repaid solely through a royalty payment of 10% of net sales proceeds of the LUNAR-COV19 vaccine candidate, up to the amount of the outstanding principal and interest under the Singapore Loan. However, all unpaid principal and interest under the Singapore Loan will be due and payable five years after draw date, if net sales of the LUNAR-COV19 vaccine exceed a certain minimum threshold during this five year period or the Company obtains clearance to sell the vaccine in specified jurisdictions. Unpaid principal and interest under the Singapore Loan will also become due and payable upon an event of default under the Support Agreement. The first vaccine sales, including the amount of net sales, shall be reported to EDB within 10 days of delivery and quarterly reports of aggregate vaccine sales, including net sales proceeds shall be provided within 30 days after quarter end.

The Singapore Loan is forgivable if the Company has not obtained regulatory approval by the final repayment date and net sales of LUNAR-COV19 are less than $100 million. If, any portion of the Singapore Loan is required to be forgiven pursuant to the terms of the Support Agreement, the EDB has the right to take ownership of certain raw materials and equipment that were purchased by the Company with proceeds of the Singapore Loan (the "Specified Assets"). The Company entered into a security agreement (the "Security Agreement") for the benefit of the EDB to provide that repayment of the Singapore Loan and related obligations are secured by a lien on the Specified Assets.

In connection with the entry into the Support Agreement, the Company entered into a consent agreement with Western Alliance Bank (the "Bank") and an amendment to the Loan and Security Agreement, dated as of October 12, 2018, between Western Alliance Bank and the Company (the "Loan"), to exclude the Specified Assets from Western Alliance Bank's lien on certain assets of the Company.

The Singapore Loan was initially recorded as long-term debt at $46.6 million, the amount of cash proceeds at the time the Company received the funding. As of June 30, 2021, the debt balance was adjusted to reflect the current exchange rate resulting in a debt balance of $46.2 million and a net foreign currency transaction gain of $0.4 million for the six months ended June 30, 2021. For the three and six months ended June 30, 2021, the Company recorded interest expense and a corresponding liability of $0.5 million and $0.9 million, respectively. As of June 30, 2021, the Company was in compliance with all covenants under the Singapore Loan and related commitments.

*Long-term debt with Western Alliance Bank*

On October 12, 2018, Arcturus Therapeutics, Inc. entered into the Loan with the Bank, whereby it received $10.0 million.

The Loan is collateralized by all of the assets of Arcturus Therapeutics, Inc., excluding intellectual property, which is subject to a negative pledge. The Loan contains customary conditions of borrowing, events of default and covenants, including covenants that restrict Arcturus Therapeutics, Inc.'s ability to dispose of assets, merge with or acquire other entities, incur indebtedness and make distributions to holders of its capital stock. In addition, Arcturus Therapeutics, Inc. is required to maintain at least 100% of its consolidated, unrestricted cash, or $15.0 million, whichever is lower, with the Bank.

On October 30, 2019, Arcturus Therapeutics, Inc. and the Bank entered into a Third Amendment (the "Third Amendment") to the Loan (as amended, the "Loan Agreement").

Pursuant to the amendment, the Bank agreed to make a term loan to Arcturus Therapeutics, Inc. on October 30, 2019, in the amount of $15.0 million (the "Term Loan"). The resulting net increase in the indebtedness of Arcturus Therapeutics, Inc. was $5.0 million. The Term Loan bears interest at a floating rate ranging from 1.25% to 2.75% above the prime rate. The amendment further provides that the Term Loan has a maturity date of October 30, 2023. Arcturus Therapeutics, Inc. will make monthly payments of interest only until October 1, 2021.

Arcturus Therapeutics, Inc. paid a loan origination fee of $54,000 which was recorded as a debt discount along with the remaining loan origination fee from the Loan and is being accreted over the term of the Term Loan. In addition, Arcturus Therapeutics, Inc. is required to pay a fee of $525,000 upon certain change of control events.

The Term Loan may be prepaid in full at any time, subject to a prepayment fee ranging from 0.50% to 2.00% of the prepaid principal amount depending upon the date of the prepayment.

Upon maturity or prepayment (as previously discussed), Arcturus Therapeutics, Inc. will be required to pay a 2% fee as a result of the FDA's approval to proceed with the Company's LUNAR-OTC program based on its IND submission. Such fee is accreted to the long-term debt balance using the effective interest method over the term of the Loan Agreement.

Should an event of default occur, including the occurrence of a material adverse effect, the Company could be liable for immediate repayment of all obligations under the Loan Agreement. As of June 30, 2021, the Company was in compliance with all covenants under the Loan Agreement.

Principal payments, including the final payment due at repayment, on the long-term debt are as follows as of June 30, 2021:

| | | |
|---|---|---|
| 2021 | $ | 1,250,000 |
| 2022 | | 7,500,000 |
| 2023 | | 6,550,000 |
| Total | $ | 15,300,000 |

The Company recognized interest expense related to its long-term debt of $0.7 million and $0.2 million during the three months ended June 30, 2021 and 2020, respectively, and $1.3 million and $0.5 million during the six months ended June 30, 2021 and 2020, respectively.

**Note 6. Stockholders' Equity**

**Alexion Pharmaceuticals License Agreement**

On February 17, 2021, the Company entered into an exclusive license agreement with Alexion Pharmaceuticals, Inc. ("Alexion") pursuant to which Alexion granted to the Company an exclusive, worldwide license to exploit certain specified Alexion patent applications. In accordance with the terms of the license agreement, and in exchange for the license, the Company issued 74,713 shares of its common stock to Alexion on February 19, 2021 valued at approximately $5.0 million. The number of shares issued under the agreement was calculated by dividing (i) five million dollars ($5.0 million) by (ii) the volume-weighted average price per share of the Company's common stock on the Nasdaq Global Market for the thirty (30) trading days immediately preceding the Effective Date (rounded to the nearest whole share). The Company recorded the transaction as an asset purchase as management concluded that all of the value received was related to a single identifiable asset. Further, the Company concluded that there was no alternative future use for the asset and recorded a charge at the closing of the transaction for the full $5.0 million value assigned to the shares issued in connection with the license agreement. This non-cash charge was recorded as acquired in-process research and development expense in the statements of operations and comprehensive loss.

**Net Loss per Share**

Dilutive securities that were not included in the calculation of diluted net loss per share for the three and six months ended June 30, 2021 as they were anti-dilutive totaled 1,011,031 and 1,242,987, respectively, and 1,505,244 and 903,949 for the three and six months ended June 30, 2020, respectively.

For the three and six months ended 2020, the calculation of the weighted-average number of shares outstanding excludes 311,333 unvested restricted shares of common stock. There were no unvested restricted shares for the six months ended June 30, 2021.

## Note 7. Share-Based Compensation Expense

In June 2020, the stockholders of the Company approved an increase to the number of shares authorized for use in making awards under the 2019 Omnibus Equity Incentive Plan (the "2019 Plan") by 2,400,000 shares to 5,000,000. Accordingly, as of June 30, 2021, a total of 665,535 shares remain available for future issuance under the 2019 Plan, subject to the terms of the 2019 Plan.

*Employee Stock Purchase Plan*

In June 2020, the stockholders of the Company approved the 2020 Employee Stock Purchase Plan ("2020 Plan") which provides for 600,000 shares of Company common stock reserved for future issuance. The first accumulation period under the 2020 Plan commenced on August 17, 2020.

Under the 2020 Plan, eligible employees may purchase shares of the Company's common stock at a discount annually, subject to a maximum of $25,000 per year. The discounted purchase price is equal to the lower of 85% of (i) the market value per share of the common stock on the first day of the accumulation period or (ii) the market value per share of common stock on the purchase date. Share-based compensation expense recognized under the 2020 Plan was $0.1 million and $0.2 million for the three and six months ended June 30, 2021, respectively.

*Stock Options*

Share-based compensation expense included in the Company's condensed consolidated statements of operations and comprehensive loss for the three and six months ended June 30, 2021 and 2020 was:

| | For the Three Months Ended June 30, | | For the Six Months Ended June 30, | |
|---|---|---|---|---|
| (in thousands) | 2021 | 2020 | 2021 | 2020 |
| Research and development | $ 3,582 | $ 396 | $ 6,828 | $ 662 |
| General and administrative | 3,958 | 705 | 7,699 | 1,288 |
| Total | $ 7,540 | $ 1,101 | $ 14,527 | $ 1,950 |

## 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 relates to the valuation allowances on the Company's net operating losses.

For the three and six months ended June 30, 2021 and 2020, the Company recorded no income tax expense. 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

*COVID-19 Vaccine Development*

On March 4, 2020, the Company was awarded a grant ("Grant 1") from the Singapore EDB to support the co-development of a potential COVID-19 vaccine with the Duke-NUS Medical School. The Grant provides for up to S$14.0 million (approximately US$10.0 million using the exchange rate at the time the grant contract was entered into) in grants to support the development of the vaccine. On June 29, 2021 the EDB agreed to amend Grant 1 to update certain delivery and milestone timelines. The Grant has been paid in full by the EDB as a result of the achievement of certain milestones related to the progress of the development of the vaccine, as set forth in the award agreement. The funds received have been recognized as contra research and development expense. The Company is liable for certain expenses during the program and is also subject to certain conditions including the completion of an external audit within 183 days of the conclusion of the claim period on February 20, 2021, or August 22, 2021, and delivery of 10

grams of LUNAR-COV19 vaccine candidate suitable for use in a phase 3 variant trial in two shipments with a partial shipment by June 30, 2022 and a remaining shipment by September 30, 2022. Additionally, the Company is required to pay an agreed upon royalty rate to Duke-NUS on future net sales of the LUNAR-COV19 vaccine candidate developed with Duke-NUS in markets or jurisdictions outside of Singapore. No contra research and development expense was recognized for the three months ended June 30, 2021 and $3.8 million was recognized for the three months ended June 30, 2020. For the six months ended June 30, 2021 and 2020, the Company recognized $1.3 million and $4.3 million, respectively, of contra expense for Grant 1. At June 30, 2021, no amount remained in accrued expenses.

On October 2, 2020, the Company was awarded another grant ("Grant 2") from the Singapore EDB to support the further development of a potential COVID-19 vaccine. On June 29, 2021 the EDB agreed to amend Grant 2 to update certain delivery and milestone timelines. The grant provides for up to S$9.3 million (approximately US$6.7 million) to support the development of the vaccine candidate for costs incurred in Singapore subject to certain conditions including (i) completing an external audit within 183 days from March 31, 2021, or September 30, 2021, (ii) delivering 10 grams of LUNAR-COV19 vaccine candidate suitable for use in a phase 3 variant trial in two shipments with a partial shipment by June 30, 2022 and a remaining shipment by September 30, 2022 and (iii) creating an entity in Singapore which was completed during the fourth quarter of 2020, and (iv) initiating a clinical trial for a variant COVID-19 vaccine by March 31, 2022. The grant will be paid in two installments upon the achievement of certain milestones related to the progress of the development of the vaccine candidate. The Company received the first installment of $3.6 million in the fourth quarter of 2020. The funds received are recognized as contra research and development expense as costs are incurred. As of June 30, 2021, the Company recognized the remaining amount of the first installment as contra expense for Grant 2.

*Cystic Fibrosis Foundation Agreement*

On August 1, 2019, the Company amended its Development Program Letter Agreement, dated May 16, 2017 and as amended July 13, 2018, with the Cystic Fibrosis Foundation ("CFF"). Pursuant to the amendment, (i) CFF increased the amount it will award to advance LUNAR-CF to $15.0 million from approximately $3.2 million, (ii) the Company will provide $5.0 million in matching funds for remaining budgeted costs and (iii) the related disbursement schedule from CFF to Arcturus was modified such that (a) $4.0 million was disbursed upon execution of the CFF Amendment, (b) $2.0 million will be disbursed within 30 days of the first day of each of January, April, July and October 2020 upon Arcturus invoicing CFF to meet project goals, and (c) the last payment of $3.0 million less the prior award previously paid out, equaling approximately $2.3 million, will be disbursed upon Arcturus Therapeutics, Inc. invoicing CFF to meet good manufacturing practices and opening an Investigational New Drug ("IND") application. The funds received from CFF will be recognized as contra research and development expense in proportion to the percentage covered by CFF of the overall budget. For the three months ended June 30, 2021 and 2020, the Company recognized contra expense of $0.9 million and $0.9 million, respectively, and for the six months ended June 30, 2021 and 2020, the Company recognized contra expense of $1.5 million and $2.9 million, respectively. As of June 30, 2021, $5.0 million remained in accrued expenses.

*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 $74,000. 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 $96,000 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 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 February 2021, the Company entered into a third non-cancellable operating lease agreement for office space near its current headquarters. The lease extends for 12 months from the commencement date with monthly base rent of approximately $11,000.

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 June 30, 2021, the remaining payments of the operating lease liability were as follows:

| (in thousands) | Remaining Lease Payments |
|---|---|
| 2021 | $ 1,022 |
| 2022 | 1,987 |
| 2023 | 2,185 |
| 2024 | 2,250 |
| Thereafter | 521 |
| Total remaining lease payments | 7,965 |
| Less: imputed interest | (1,176) |
| Total operating lease liabilities | $ 6,789 |
| Weighted-average remaining lease term | 3.75 years |
| Weighted-average discount rate | 8.4% |

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 $0.5 million and $0.5 million for the three months ended June 30, 2021 and 2020, respectively, and $0.9 million and $0.9 million for the six months ended June 30, 2021 and 2020, respectively.

**Note 10. Related Party Transactions**

*Ultragenyx*

On June 17, 2019, Arcturus and Ultragenyx executed Amendment 3 to the Ultragenyx Agreement. Pursuant to the amended Ultragenyx Agreement, the Company also granted Ultragenyx a two-year option to purchase up to 600,000 additional shares of common stock at a price of $16.00 per share. Ultragenyx exercised the option in May 2020 and owns 8.4% of the outstanding common stock of the Company as of June 30, 2021. For the three months ended June 30, 2021 and 2020, the Company recognized revenue of $0.9 million related to the Ultragenyx Agreement. For the six months ended June 30, 2021 and 2020, the Company recognized revenue of $1.8 million. As of June 30, 2021, the Company holds an accounts receivable balance of a negligible amount related to the Ultragenyx Agreement.

*Equity-Method Investment*

In June 2018, the Company completed the sale of its intangible asset related to the ADAIR technology. Pursuant to the asset purchase agreement for ADAIR, the Company received a 30% ownership interest in the common stock of Vallon Pharmaceuticals, Inc. (“Vallon”) in consideration for the sale of the ADAIR technology. The Company has no requirement to invest further in Vallon. Vallon completed an initial public offering and began trading on The Nasdaq Stock Market under the ticker “VLON” in February 2021. Immediately after this offering, Arcturus owned 843,750 shares of Vallon, or approximately 12%. Based on the Company’s ownership and the Vallon board of directors seat held by an executive of the Company, the Company has the ability to exercise significant influence over the operating and financial policies of Vallon; therefore, the Company accounts for this investment as an equity-method investment. The Company accounts for its share of the earnings or losses of the investee with a reporting lag of three months, as the financial statements of the investee are not completed on a basis that is sufficient for the Company to apply the equity method on a current basis. The offering was at a share price of $8.00, greater than the initial investment which resulted in the Company recording a gain in its equity-method investment. Using a three month lag, the gain has been offset by losses incurred by Vallon through March 31, 2021.

**Note 11. Subsequent Events**

*Vingroup Agreement*

On August 2, 2021, the Company announced an agreement with Vinbiocare Biotechnology Joint Stock Company (“Vinbiocare”), a member of Vingroup Joint Stock Company, regarding a collaboration to establish a manufacturing facility in Vietnam for the manufacture of Arcturus’ investigational COVID-19 vaccines, for sale and use within Vietnam.

Under the terms of the arrangement, Vinbiocare will build out a manufacturing facility in Vietnam, and the Company will provide to Vinbiocare access to proprietary technologies and processes for the manufacture of Arcturus’ investigational COVID-19 vaccines. The Company will also provide Vinbiocare with an exclusive license to manufacture the vaccines in Vietnam at the facility solely for distribution in Vietnam. The license and technology transfer applies toward drug product manufacturing but not toward mRNA drug substance manufacturing.

Vinbiocare will make an upfront payment of $40 million and be responsible for costs associated with the technology transfer. Vinbiocare will also pay for mRNA drug substance supplied by the Company and royalties on vaccines produced at the manufacturing facility.

On June 11, 2021, the Company and Vinbiocare executed a deposit agreement whereby Vinbiocare paid the Company a $10 million deposit prior to June 30, 2021 to demonstrate its commitment to reach a mutual agreement on a technology transfer of Arcturus' vaccine manufacturing technology ("Definitive Agreement"). In the event a Definitive Agreement was not signed, $500,000 of the deposit was non-refundable.

**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 six-month periods ended June 30, 2021. 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, 2020 (the "2020 Annual Report"), which was filed with the U.S. Securities and Exchange Commission (the "Commission") on March 1, 2021. Unless otherwise defined herein, capitalized words and expressions used herein shall have the same meanings ascribed to them in the 2020 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**

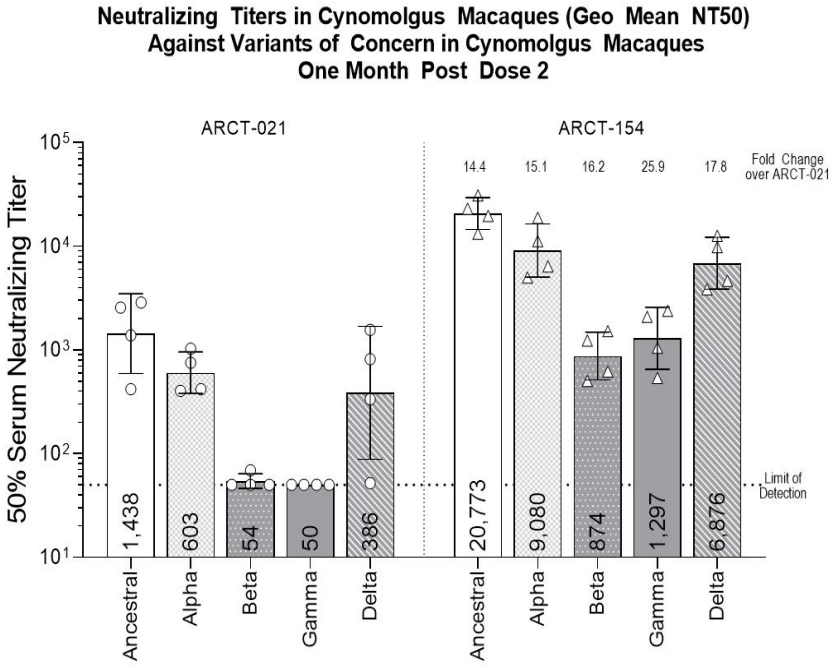
Arcturus is a global clinical-stage messenger RNA medicines company focused on the development of infectious disease vaccines and significant opportunities within liver and respiratory rare diseases. In addition to our mRNA platform, our proprietary lipid nanoparticle delivery system, LUNAR, has the potential to enable multiple nucleic acid medicines, and our proprietary STARR technology has the potential to provide longer-lasting RNA and sustained protein expression.

Our key proprietary technology has the potential to address the major hurdles in RNA development, namely the effective and safe delivery of RNA therapeutics to disease-relevant target tissues. We believe that the versatility of our platform to target multiple tissues, its compatibility with various nucleic acid therapeutics, and our expertise in developing scalable manufacturing processes put us in a good position to deliver on the next generation of nucleic medicines.

In January 2021, we announced completion of the Phase 1 clinical study of our lead LUNAR-COV19 vaccine candidate ("ARCT-021"). The study was conducted with CTI Clinical Trial and Consulting Services, a global CRO, and in collaboration with Duke-NUS Medical School in Singapore. In January 2021, we commenced a Phase 2 clinical study of ARCT-021 in the United States and Singapore. In March 2021, we completed enrollment of the Phase 2 study, with 579 subjects randomized and dosed. We have completed two interim analyses of the Phase 2 safety data, which have been reviewed by the Data and Safety Monitoring Board and support continuation of the Phase 2 trial without amendment. In addition, interim immunogenicity data demonstrate >90% seroconversion for IgG antibodies binding the full-length spike protein following a single 5µg dose. These favorable safety and single-dose immunogenicity data of ARCT-021 support the rationale to initiate a Phase 3 efficacy study. ARCT-021 has been selected by a global entity for inclusion in a multinational Phase 3 vaccine trial against COVID-19. The placebo-controlled study plans to enroll tens of thousands of participants and will evaluate a 5-µg dose of ARCT-021 administered as a single injection regimen. The Phase 3 study, upon commencement, will be sponsored and funded by the entity. However, the entity may determine not to initiate, or to delay or halt, the Phase 3 clinical trial.

In August 2021, our strategic partner, Vinbiocare Biotechnology Joint Stock Company ("Vinbiocare") received approval for a Clinical Trial Application (CTA) from the Vietnam Ministry of Health to advance ARCT-154, a next generation LUNAR-COV19 vaccine candidate, into a Phase 1/2/3 clinical study. The trial is a randomized, observer-blind, placebo-controlled design and will be funded by Vinbiocare, a subsidiary of Vingroup Joint Stock Company, the largest private industry conglomerate in Vietnam. The study is to assess the safety, immunogenicity and efficacy of the SARS-CoV-2 self-amplifying mRNA vaccine in up to 21,000 adults. Preclinical data demonstrate strong neutralizing immunogenicity in non-human primates to SARS-CoV-2 Alpha, Beta, Gamma, and Delta variants. ARCT-154 elicits 14.4 to 25.9-fold higher neutralizing antibody titers than ARCT-021 in non-human primates, including an observed increase of 17.8-fold higher neutralizing antibody titers against the Delta variant.

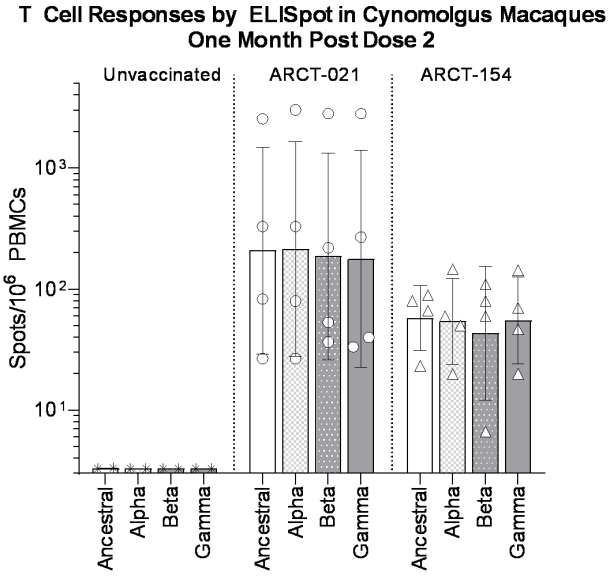
ARCT-154 utilizes an optimized STARR™ mRNA with multiple improvements, including modifications for stability and translation, increased immunogenicity of the spike protein antigen via amino acid substitution, expressing the spike protein in a pre-fusion state, and inactivating the furin cleavage site.




| Neutralizing Titers (Geo Mean NT50) Against Variants of Concern in Cynomolgus Macaques One Month Post Dose 2 | | | | | |
|---|---|---|---|---|---|
| **STARR™ Vaccine** | **Ancestral** | **Alpha** | **Beta** | **Gamma** | **Delta** |
| ARCT-021 (7.5 mcg x 2) | 1,438 | 603 | 54 | 50 | 386 |
| ARCT-154 (7.5 mcg x 2) | 20,773 | 9,080 | 874 | 1,297 | 6,876 |
| **Fold Improvement** | **14.4** | **15.1** | **16.2** | **25.9** | **17.8** |

Non-Human Primate (NHP) data collected one month after second dose of 7.5 mcg; analysis of NHP serum was performed using non-replicating vesicular stomatitis virus pseudo-typed with the spike protein of the SARS-CoV-2 variants of concern indicated. Titers were determined by calculating the dilution that resulted in 50% inhibition of cells expressing GFP encoded by the pseudovirus, a surrogate of virus infection. No assurances can be given that non-human primate data will be replicated in human subjects or that ARTC-154 will prove to be effective.

T cell responses for ARCT-021 and ARCT-154 are robust and similar in non-human primates. Notably, STARR™ mRNA vaccines elicit T cell responses consistent against all variants of concern tested. The robust T cell responses are attributed to the self-amplifying mRNA mechanism of antigen expression.




T cell responses from non-human primates assessed one month after second dose of 7.5 mcg; SARS-CoV-2 spike specific T cell responses were analyzed by ELISpot assay using overlapping 15-mer peptides spanning the entire spike antigen from the ancestral SARS-CoV-2 strains or the Alpha, Beta, and Gamma variants of concern. Spot Forming Units (SFU) were determined after background subtraction of unstimulated controls.

On August 3, 2021, we announced the approval for a Clinical Trial Application (CTA) from the Singapore Health Sciences Authority (HSA) to enable the advancement of two STARR™ mRNA vaccine candidates into the clinic. The Phase 1/2 clinical trial will evaluate the vaccines both as a primary vaccination series and as a booster following initial vaccination with another authorized vaccine. The Phase 1/2 trial costs are funded in part from a previously secured grant from Singapore.

In November 2020, we completed our ARCT-810 Phase 1, dose escalation study in healthy subjects, at doses up to 0.4 mg/kg. On July 28, 2021, the Company announced that it has received approval from the UK Health Research Authority to initiate a Phase 2 clinical study for ARCT-810, a novel mRNA-based therapeutic candidate for Ornithine Transcarbamylase (“OTC”) Deficiency.

Our activities since inception have consisted principally of performing research and development activities, general and administrative activities and raising capital to fund those efforts. Our activities are subject to significant risks and uncertainties, including failing to secure additional funding before we achieve sustainable revenues and profit from operations. As of June 30, 2021, we had an accumulated deficit of $247.4 million.

**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, 2020. 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.

***Collaboration 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 and royalties on future sales. The following table summarizes our total revenues for the periods indicated (in thousands):

| | Three Months Ended June 30, | | 2020 to 2021 | |
|---|---|---|---|---|
| (Dollars in thousands) | 2021 | 2020 | $ change | % change |
| Collaboration revenue | $ 2,001 | $ 2,322 | $ (321) | -13.8% |

| | Six Months Ended June 30, | | 2020 to 2021 | |
|---|---|---|---|---|
| (Dollars in thousands) | 2021 | 2020 | $ change | % change |
| Collaboration revenue | $ 4,128 | $ 4,968 | $ (840) | -16.9% |

Collaboration revenue decreased by $0.3 million during the three months ended June 30, 2021 as compared to the three months ended June 30, 2020. The decrease in collaboration revenue primarily relates to a decrease in sublicense revenue as we received approximately $0.3 million in sublicense revenue from SGI in the second quarter of 2020 that did not reoccur in 2021. The decrease was also attributable to a $0.3 million decrease in revenue from material transfer agreements as we have shifted more resources into the COVID-19 vaccine program. The decrease was partially offset by higher research and development expense reimbursements recognized in the second quarter of 2021 primarily related to other collaboration agreements including Janssen.

Collaboration revenue decreased by $0.8 million during the six months ended June 30, 2021 as compared to the six months ended June 30, 2020. The decrease in collaboration revenue primarily relates to (i) a decrease in sublicense revenue as we received approximately $0.3 million in sublicense revenue from SGI during the first six months of 2020 that did not reoccur in 2021 and (ii) a $0.3 million decrease in revenue from material transfer agreements as we have shifted more resources into the COVID-19 vaccine program.

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

| | Three Months Ended June 30, | | 2020 to 2021 | | Six Months Ended June 30, | | 2020 to 2021 | |
|---|---|---|---|---|---|---|---|---|
| (Dollars in thousands) | 2021 | 2020 | $ change | % change | 2021 | 2020 | $ change | % change |
| Operating expenses: | | | | | | | | |
| Research and development, net | $ 45,679 | $ 7,944 | $ 37,735 | * | $ 95,729 | $ 15,861 | $ 79,868 | * |
| General and administrative | 10,042 | 4,420 | 5,622 | * | 19,785 | 8,611 | 11,174 | * |
| Total | $ 55,721 | $ 12,364 | $ 43,357 | * | $ 115,514 | $ 24,472 | $ 91,042 | * |

* *Greater than 100%*

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

| | Three Months Ended June 30, | | 2020 to 2021 | | Six Months Ended June 30, | | 2020 to 2021 | |
|---|---|---|---|---|---|---|---|---|
| (Dollars in thousands) | 2021 | 2020 | $ change | % change | 2021 | 2020 | $ change | % change |
| External pipeline development expenses: | | | | | | | | |
| LUNAR-OTC | $ 2,067 | $ 1,182 | $ 885 | 74.9% | $ 5,153 | $ 4,874 | $ 279 | 5.7% |
| LUNAR-CF, net | 834 | 968 | (134) | -13.8% | 2,238 | 1,304 | 934 | 71.6% |
| LUNAR-COVID, net | 27,085 | 2,428 | 24,657 | * | 56,397 | 2,559 | 53,838 | * |
| Discovery technologies | 5,706 | (246) | 5,952 | * | 13,551 | 235 | 13,316 | * |
| External platform development expenses: | | | | | | | | |
| Partnered discovery technologies | 173 | 410 | (237) | * | 636 | 780 | (144) | * |
| Total development expenses | $ 35,865 | $ 4,742 | $ 31,123 | * | $ 77,975 | $ 9,752 | $ 68,223 | * |
| Personnel related expenses | $ 8,563 | $ 2,174 | $ 6,389 | * | $ 15,472 | $ 4,377 | $ 11,095 | * |
| Facilities and equipment expenses | 1,251 | 1,028 | 223 | 21.7% | 2,282 | 1,732 | 550 | 31.8% |
| Total research and development expenses, net | $ 45,679 | $ 7,944 | $ 37,735 | * | $ 95,729 | $ 15,861 | $ 79,868 | * |

* *Greater than 100%*

***Research and Development Expenses, net***

Our research and development expenses consist primarily of external manufacturing costs, in-vivo research studies performed by contract research organizations, clinical and regulatory consultants, personnel related expenses and laboratory supplies related to conducting research and development activities. Costs to acquire and manufacture pre-launch inventory, mRNA supply for preclinical studies and clinical trials are recognized and included in external pipeline development expenses for the specific program.

LUNAR-OTC expenses increased by $0.9 million and $0.3 million during the three and six months ended June 30, 2021, respectively, as compared to 2020. The increase related to non-recurring expenses for the Phase 1 clinical trial for ARCT-810.

LUNAR-CF expenses were relatively consistent during the three months ended June 30, 2021 when compared to the three months ended June 30, 2020, decreasing by $0.1 million. LUNAR-CF expenses increased by $0.9 million during the six months ended June 30, 2021 when compared to the six months ended June 30, 2020. Expenses incurred were partially offset with funds awarded by the CFF. The increase in LUNAR-CF expenses was due primarily to increased research and development cost incurred in association with the amendment to the CFF Agreement executed in July 2019, and we expect that our development efforts and associated costs will increase over the next several years as the LUNAR-CF program moves toward expected CTA submission in the first half of 2022.

LUNAR-COVID expenses increased by $24.7 million and $53.8 million during the three and six months ended June 30, 2021, respectively, as compared to 2020. The increase is due to the fact that the LUNAR-COV19 program did not commence until late in the first quarter of 2020 and is now in clinical trials. Expenses related to pre-launch inventory represent $10.0 million and $26.3 million of the increase for the three and six months ended June 30, 2021, respectively, with no expense incurred during the 2020 periods. We expect that the program costs and pre-launch inventory costs will continue to increase as clinical trials progress and we advance program development.

Discovery technologies represents our efforts to expand our product pipeline and are expected to continually increase in the near future. Partnered discovery technologies increased by $6.0 million and $13.3 million during the three and six months ended June 30, 2021, respectively, as compared to 2020. The increase is primarily due to the addition of several new development programs during 2020. Further, in the first quarter of 2021 we acquired an exclusive license from Alexion Pharmaceuticals to certain intellectual property for approximately $5.0 million of our common stock, which we expensed in 2021.

Within our platform development expenses, our partnered discovery expenses with our current partners are expected to fluctuate based on the needs of our collaboration partners and was relatively flat year over year. We expect partnered discovery technologies expenses to fluctuate based on the needs of our collaboration partners.

Personnel related expenses, net of funds received from CFF and the Singapore EDB, increased by $6.4 million and $11.1 million during the three and six months ended June 30, 2021, respectively, as compared to 2020. The increases were associated with increased headcount costs necessary to advance our external pipeline, platform and clinical trial efforts as well as increased share-based compensation expense.

Facilities and equipment expenses increased by $0.2 million and $0.6 million during the three and six months ended June 30, 2021, respectively, as compared to 2020. The increases resulted primarily from higher rent and related costs associated with an additional lease that we entered into in February 2020.

***General and Administrative Expenses***

General and administrative expenses consist primarily of salaries and related benefits for our executive, administrative and accounting functions and professional service fees for legal and accounting services as well as other general and administrative expenses.

General and administrative expenses increased by $5.6 million and $11.2 million during the three and six months ended June 30, 2021, respectively, as compared to 2020. The increases resulted primarily from personnel expense due to increased headcount and increased share-based compensation expense.

***Finance (expense) income, net***

| | Three Months Ended June 30, | | 2020 to 2021 | | Six Months Ended June 30, | | | |
|---|---|---|---|---|---|---|---|---|
| (Dollars in thousands) | 2021 | 2020 | $ change | % change | 2021 | 2020 | $ change | % change |
| Interest income | $ 190 | $ 74 | $ 116 | * | $ 378 | $ 176 | $ 202 | * |
| Interest expense | (710) | (195) | (515) | * | (1,256) | (449) | (807) | * |
| Total | $ (520) | $ (121) | $ (399) | * | $ (878) | $ (273) | $ (605) | * |

** Greater than 100%*

Interest income is generated on cash and cash equivalents. The increase in interest income for the three and six months ended June 30, 2021 as compared to the prior year period was a result of increased cash and cash equivalents balances. Interest expense was incurred in conjunction with our Loan and Security Agreement with Western Alliance Bank and the Singapore Loan. The increase in interest expense for the three and six months ended June 30, 2021 as compared to the prior year period was primarily a result of additional accrued interest expense related to the Singapore Loan that was funded in January 2021.

***Other income and expense***

Other income and expense items relate to gains and losses from foreign currency transactions and from equity-method investments. We recorded a gain of $0.4 million for foreign currency transactions under the Singapore Loan during the first six months of 2021. Additionally, during the three months ended June 30, 2021 we recorded a loss of $0.3 million in connection with our equity-method investment in Vallon Pharmaceuticals, Inc., of which we hold approximately 12%. However, during the first six months of 2021 we have recorded a total net gain of $0.9 million related to the Vallon equity-method investment.

**Off-balance sheet arrangements**

Through June 30, 2021, 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 June 30, 2021, 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. At June 30, 2021, we had $433.6 million in unrestricted cash and cash equivalents.

*Loan and Security Agreement*

On October 12, 2018, we entered into a Loan and Security Agreement with Western Alliance Bank whereby we received gross proceeds of $10.0 million under a long-term debt agreement (the "Loan").

On October 30, 2019, we and the Bank entered into a Third Amendment (the "Third Amendment") to the Loan and Security Agreement dated as of October 12, 2018 (as amended, the "Loan Agreement").

Pursuant to the Third Amendment, the Bank agreed to make a term loan to us on October 30, 2019, in the amount of $15.0 million (the "Term Loan"). The resulting net increase in the indebtedness of us was $5.0 million. The Term Loan bears interest at a floating rate ranging from 1.25% to 2.75% above the prime rate. The amendment further provides that the Term Loan has a maturity date of October 30, 2023. We shall make monthly payments of interest only until the interest-only end date of October 1, 2021 and thereafter shall make monthly payments of principal and interest during a 24-month amortization period. Upon maturity or prepayment, we will be required to pay a 2% fee as a result of the FDA's approval to proceed with the Company's LUNAR-OTC (ARCT-810) program based on its IND submission.

*Grants from the Economic Development Board of the Republic of Singapore*

On March 4, 2020, we were awarded a grant ("Grant 1") from the Economic Development Board of the Republic of Singapore (the "EDB") to support the co-development of a potential COVID-19 vaccine program with the Duke-NUS Medical School. The Grant provides for up to S$14.0 million (approximately US$10.0 million using the exchange rate at the time the grant contract was entered into) in grants to support the development of the vaccine. On June 29, 2021 the EDB agreed to amend Grant 1 to update certain delivery and milestone timelines. The Grant has been paid in full by the EDB as a result of the achievement of certain milestones related to the progress of the development of the vaccine, as set forth in the award agreement. The funds received have been recognized as contra research and development expense. We are liable for certain expenses during the program and were also subject to certain conditions including the completion of an external audit within 183 days of the conclusion of the claim period on February 20, 2021, or August 22, 2021, and delivery of 10 grams of LUNAR-COV19 vaccine candidate suitable for use in a phase 3 variant trial in two shipments with a partial shipment by June 30, 2022 and a remaining shipment by September 30, 2022. Additionally, we are required to pay an agreed upon royalty rate to Duke-NUS on future net sales of the LUNAR-COV19 vaccine candidate in markets or jurisdictions outside of Singapore.

On October 2, 2020, we were awarded another grant ("Grant 2") from the EDB to support the further development of a potential COVID-19 vaccine program. On June 29, 2021 the EDB agreed to amend Grant 2 to update certain delivery and milestone timelines. The grant provides for up to S$9.3 million (approximately US$6.7 million) to support the development of the vaccine candidate for

costs incurred in Singapore subject to certain conditions including (i) completing an external audit within 183 days from March 31, 2021, or September 30, 2021, (ii) delivering 10 grams of LUNAR-COV19 vaccine candidate suitable for use in a phase 3 variant trial in two shipments with a partial shipment by June 30, 2022 and a remaining shipment by September 30, 2022 and (iii) creating an entity in Singapore which was completed during the fourth quarter of 2020, and (iv) initiating a clinical trial for a variant COVID-19 vaccine by March 31, 2022. The grant will be paid in two installments upon the achievement of certain milestones related to the progress of the development of the vaccine candidate. We received the first installment of $3.6 million in the fourth quarter of 2020.

*Manufacturing Support Agreement*

On November 7, 2020, we entered into a Manufacturing Support Agreement (the "Support Agreement") with the EDB. Pursuant to the Support Agreement, the EDB agreed to make a term loan of S$62.1 million, subject to the satisfaction of customary deliveries, to support the manufacture of the LUNAR-COV19 vaccine candidates (the "Singapore Loan"). In June 2021, the EDB agreed to amend the Singapore Loan. The amendment includes certain loan covenants requiring (i) unused funds as of March 31, 2022 to be subsequently returned within thirty days, subject to any further agreed upon extension of the reconciliation date, (ii) us to provide a quarterly reconciliation report within forty-five days of each financial quarter end, (iii) an external audit of expenses paid through June 30, 2021 to be completed by September 30, 2021, and a projection of expenditures through March 31, 2022 followed by an audited statement of actual expenditures through March 31, 2022 by June 30, 2022, (iv) us to deliver 10 grams of LUNAR-COV19 vaccine candidate suitable for use in a phase 3 variant trial in two shipments with a partial shipment by June 30, 2022 and a remaining shipment by September 30, 2022, (v) us to provide EDB with a right of first refusal on GMP manufacturing slots of the LUNAR-COV19 vaccine candidate up to an agreed-upon maximum amount, (vi) and the obligation to repay the Singapore Loan will be secured by an interest in the raw materials and manufacturing equipment purchased by us with the funds from the Singapore Loan in form and substance satisfactory to the EDB in its sole discretion. We elected to borrow the full amount available under the Support Agreement of S$62.1 million ($46.6 million) on January 29, 2021.

The Singapore Loan accrues interest at a rate of 4.5% per anum calculated on a daily basis. Subject to certain exceptions, the Singapore Loan is intended to be a limited recourse loan that will be repaid solely through a royalty payment of 10% of net sales proceeds of the LUNAR-COV19 vaccine candidate, up to the amount of the outstanding principal and interest under the Singapore Loan. However, all unpaid principal and interest under the Singapore Loan will be due and payable five years after draw date, if net sales of the LUNAR-COV19 vaccine exceed a certain minimum threshold during this five year period or we obtain clearance to sell the vaccine in specified jurisdictions. Unpaid principal and interest under the Singapore Loan will also become due and payable upon an event of default under the Support Agreement. The first vaccine sales, including the amount of net sales, shall be reported to EDB within 10 days of delivery and quarterly reports of aggregate vaccine sales, including net sales proceeds shall be provided within 30 days after quarter end.

The Singapore Loan is forgivable if we have not obtained regulatory approval by the final repayment date and net sales of LUNAR-COV19 are less than $100 million. If, any portion of the Singapore Loan is required to be forgiven pursuant to the terms of the Support Agreement, the EDB has the right to take ownership of certain raw materials and equipment that were purchased by us with proceeds of the Singapore Loan (the "Specified Assets"). We entered into a security agreement (the "Security Agreement") for the benefit of the EDB to provide that repayment of the Singapore Loan and related obligations are secured by a lien on the Specified Assets.

In connection with the entry into the Support Agreement, we entered into a consent agreement with Western Alliance Bank (the "Bank") and an amendment to the Loan and Security Agreement, dated as of October 12, 2018, to exclude the Specified Assets from Western Alliance Bank's lien on certain assets.

*Vinbiocare Agreement*

On August 2, 2021, we announced an agreement with Vinbiocare Biotechnology Joint Stock Company ("Vinbiocare"), a member of Vingroup Joint Stock Company, regarding a collaboration to establish a manufacturing facility in Vietnam for the manufacture of our investigational COVID-19 vaccine program, for sale and use within Vietnam.

Under the terms of the arrangement, Vinbiocare will build out a manufacturing facility in Vietnam, and we will provide to Vinbiocare access to proprietary technologies and processes for the manufacture of our investigational COVID-19 vaccine program. We will also provide Vinbiocare with an exclusive license to manufacture the vaccines in Vietnam at the facility solely for distribution in Vietnam. The license and technology transfer applies toward drug product manufacturing but not toward mRNA drug substance manufacturing. Vinbiocare will make an upfront payment of $40 million and be responsible for costs associated with the technology transfer. Vinbiocare will also pay for mRNA drug substance supplied by us and royalties on vaccines produced at the manufacturing facility.

*General Financial Resources*

A significant portion of our current unrestricted cash and cash equivalents balance of $433.6 million is expected to be utilized during fiscal year 2021 to fund (i) the continued Phase 1 trial and anticipated Phase 2 trial of ARCT-810, our LUNAR-OTC candidate, (ii) advancing our new LUNAR-FLU program toward submission of an IND, (iii) and other programs and administrative costs.

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. Our future capital requirements are difficult to forecast and will depend on many factors.

We expect to continue to incur additional losses for the foreseeable future, and we will need to raise additional debt or equity financing or enter into additional partnerships to fund development. The ability of our Company to transition to profitability is dependent on identifying and developing successful mRNA drug candidates. In the near future, if we are not able to achieve planned milestones, incur costs in excess of our forecasts, or do not meet covenant requirements of our debt, we will need to reduce discretionary spending, discontinue the development of some or all of our products, 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.

***Overview***

The following table shows a summary of our cash flows for the six months ended June 30, 2021 and 2020 (in thousands):

| | Six Months Ended June 30, | |
|---|---|---|
| **(Dollars in thousands)** | **2021** | **2020** |
| Cash provided by (used in): | | |
| Operating activities | $ (75,893) | $ (20,352) |
| Investing activities | (522) | (611) |
| Financing activities | 47,094 | 85,721 |
| Net (decrease) increase in cash, cash equivalents and restricted cash | $ (29,321) | $ 64,758 |

***Operating Activities***

Our primary use of cash is to fund operating expenses, which consist mainly of research and development and general and administrative expenditures. We have incurred significant expenses which have been partially offset by cash collected through our collaboration agreements. Cash collections under the collaboration agreements can vary from year to year depending on the terms of the agreement and work performed. These changes on cash flows primarily relate to the timing of cash receipts for upfront payments, reimbursable expenses and achievement of milestones under these collaborative agreements.

Net cash used in operating activities was $75.9 million on a net loss of $110.9 million for the six months ended June 30, 2021, compared to net cash used of $20.4 million on a net loss of $20.0 million for the six months ended June 30, 2020. Adjustments for non-cash charges were $20.4 million and $3.3 million for the six months ended June 30, 2021 and 2020, respectively. Changes in working capital resulted in adjustments to operating net cash inflows of $14.7 million and outflows of $3.6 million for the six months ended June 30, 2021 and 2020, respectively. Changes in working capital for the six months ended June 30, 2021 were primarily driven by increases in deferred revenue, accounts payable and accrued liabilities, partly offset by decreases in prepaid expenses and accounts receivable. Changes in working capital for the six months ended June 30, 2020 were primarily driven by decreases in deferred revenue, accounts payable, prepaid expenses and accounts receivable and was partly offset by an increase to accrued liabilities.

***Investing Activities***

Net cash used in investing activities of $0.5 million and $0.6 million for the six months ended June 30, 2021 and 2020, respectively, reflects cash used to purchase property and equipment.

***Financing Activities***

Net cash provided by financing activities of $47.1 million for the six months ended June 30, 2021 consisted of net proceeds from the Singapore Loan of $46.6 million and proceeds from the exercise of stock options of $0.5 million. Net cash provided by financing activities for the six months ended June 30, 2020 reflects proceeds of $9.6 million from the issuance of common stock to Ultragenyx, proceeds from the issuance of common stock of $75.3 million, and proceeds from the exercise of stock options of $0.8 million.

***Funding Requirements***

We anticipate that we will continue to generate annual net 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. The Company intends to seek additional capital through equity 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 demonstration of safety and efficacy of our product candidates, particularly ARCT-021, in ongoing clinical trials;
- the achievement of milestones under our strategic alliance agreements;
- the terms and timing of any other strategic alliance, licensing and other arrangements that we may establish;
- 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 extent to which we acquire or invest in businesses, products or technologies; and
- the identification and consummation of funding arrangements with third parties, including foreign governments and United States government agencies.

**Critical Accounting Policies and Estimates**

We prepare our condensed consolidated financial statements in conformity with GAAP. As such, we make certain estimates, judgements and assumptions that we believe are reasonable, based upon information available to us. These judgements involve making estimates about the effect of matters that are inherently uncertain and may significantly impact our 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, 2020.

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 our Annual Report on Form 10-K for the year ended December 31, 2020.

**Item 3. Quantitative and Qualitative Disclosures About Market Risk.**

Our primary exposure to market risk is interest income and expense sensitivity and foreign currency exchange rates. Interest income and expense sensitivity is affected by changes in the general level of interest rates in the United States. Foreign exchange market risks relate to the grants and loan from the Singapore Economic Development Board which is discussed in this Quarterly Report in "Notes to Condensed Consolidated Financial Statements, Note 1. Description of Business." When deemed appropriate, we may manage our exposure to foreign exchange market risks through the use of derivative financial instruments. We may utilize such derivative financial instruments for hedging or risk management purposes. Due to the nature of our cash and cash equivalents and our evaluation of the potential impact of foreign currency exchange rates, we believe that we are not currently subject to any material market risk exposure.

**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 June 30, 2021, 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 period ended June 30, 2021 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 period 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.

On December 13, 2019, a former employee of the Company filed a complaint in San Diego County Superior Court, captioned Adonary Munoz v. Arcturus Therapeutics, Inc., et al, Case No. 37-2019-00066358-CU-PO-CTL. The lawsuit alleged sexual assault by an acquaintance of one of our employees and sought to hold the Company liable on a number of causes of action. On January 17, 2020, a second amended complaint ("SAC") was filed seeking $30.0 million in damages, including punitive damages and damages for emotional distress. The plaintiff agreed to stipulate to arbitration for the claims being alleged against the Company. On May 5, 2021, the parties settled the dispute, and the parties agreed to dismiss the legal proceedings. The settlement did not result in any material liability to the Company as the settlement payment was covered by the Company's insurance.

### 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, 2020, which we strongly encourage you to review. Other than as set forth below, there have been no material changes to the risk factors described in our Annual Report on Form 10-K for the year ended December 31, 2020 filed with the SEC on March 1, 2021.

***ARCT-021 has been selected by a global entity for inclusion in a Phase 3 trial against COVID-19. If the Phase 3 clinical trial is not initiated or experiences significant delays in doing so, we may be unable to fund or timely initiate a Phase 3 clinical trial on ARCT-021 or any other COVID-19 vaccine candidate. If any clinical trial does not generate successful results, we may be unable to market and sell ARCT-021 or any other COVID-19 vaccine.***

We have commenced a Phase 2 trial of ARCT-021 and the candidate has been selected by a global entity for inclusion in a Phase 3 clinical trial. However, the entity may determine not to initiate, or to delay or halt, the Phase 3 clinical trial. If the Phase 3 clinical trial is not initiated or experiences significant delays in doing so, we may be unable to fund or to timely initiate a Phase 3 clinical trial of ARCT-021 or any other COVID-19 vaccine. If we were to determine to initiate additional or separate Phase 3 clinical trial, we would need to identify additional funding sources to conduct and complete any Phase 3 trial commenced. The data received to date, although providing sufficient information to allow us to proceed further is not complete enough to provide conclusive evidence with respect to safety and potential efficacy of ARCT-021.

Clinical trial results are inherently uncertain, and a significant portion of our success and business prospects depend on the progress of this program. Our failure to demonstrate safety or obtain positive clinical trial results, inability to meet the expected timeline for release of data for this trial, or failure to successfully develop a single-dose vaccine could have an adverse effect on our business operations and financial condition. Furthermore, we will not have a detailed understanding of the efficacy of ARCT-021 until infection of a sufficient number of subjects in a Phase 3 trial, enrollment for which may be delayed or prevented by rollout of competing vaccines for COVID-19, competing clinical trials and the refusal of certain countries' regulatory authorities to allow placebo-controlled trials for COVID-19 vaccine candidates. We cannot be certain if we will receive approval to proceed with a Phase 3 study, when we will begin enrollment, or the nature of the protocols that may eventually be approved. If the data is not positive or is inconclusive, we may not be able to continue our studies or identify additional funding to continue the studies. No assurance can be given that the results of the trials will produce adequate results to allow us to commence or continue expected trials or that that adequate efficacy will be demonstrated such that ARCT-021 will be a viable commercial product.

***Our strategic partner, Vinbiocare, has received approval to conduct a Phase 1/2/3 clinical trial for ARCT-154, our next generation COVID-19 vaccine candidate, in Vietnam. If the Phase 1/2/3 clinical trial is not initiated or experiences significant delays in doing so, we may be unable to fund or timely initiate a clinical trial on ARCT-154 or any other COVID-19 vaccine candidate. If the planned clinical trial does not generate successful results, or the results are not accepted by government authorities outside of Vietnam, then we may be unable to, or be significantly limited in our ability to, market and sell ARCT-154 or any other COVID-19 vaccine.***

Our strategic partner may determine not to initiate, or to delay or halt, the clinical trial. If our strategic partner does not proceed with the clinical trial or experiences significant delays in doing so, we may be unable to fund or to timely initiate a clinical trial of ARCT-154 or any other COVID-19 vaccine programs. If we were to determine to initiate additional or separate Phase 3 clinical trial, we would need to identify additional funding sources to conduct and complete any Phase 3 trial commenced. or does not generate successful results, or experiences significant delays in doing so, we may be unable to market and sell a COVID-19 vaccine program. If we were to determine to initiate additional or separate clinical trials, we would need to identify additional funding sources to conduct and complete any trial commenced. If the clinical trial does not generate successful results, or if the results are not accepted by government authorities outside of Vietnam, then we may be unable to, or be significantly limited in our ability to, market and sell ARCT-154 or any other COVID-19 vaccine.

***If government bodies in the United States or elsewhere implement a waiver on patents on COVID-19 vaccines, there could be a significant adverse effect on our business.***

On May 5, 2021, the Biden Administration announced that it supports a waiver for patents on vaccines protecting against the coronavirus. Any action by governments of the United States or other countries, or by global governmental authorities, that limit the ability of companies to enforce their patents or other technology could limit the value of the Company's intellectual property and revenue potential for the Company's product candidates.

**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.**

None.

**Item 6. Exhibits.**

**Exhibit Index**

| Exhibit Number | Description |
|---|---|
| 1.1 | Underwriting Agreement, dated December 7, 2020, by and among Arcturus Therapeutics Holdings Inc., Piper Sandler & Co., Guggenheim Securities, LLC and Wells Fargo Securities, LLC. Incorporated by reference to Exhibit 1.1 to Current Report on Form 8-K filed on December 8, 2020 (File No. 001-38942). |
| 3.1 | 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). |
| 3.2 | 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). |
| 3.3 | 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). |
| 4.1 | 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, 2020 filed on March 1, 2020 (File No. 001-38942). |
| 10.1† | 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). |
| 10.2† | 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. 001-38942). |
| 10.3† | Arcturus Therapeutics Ltd. Amended and Restated Compensation Policy for Company Office Holders. Incorporated by reference to Exhibit 99.2 to the Company's Report of Foreign Private Issuer on Form 6-K filed on July 27, 2018 (File No. 001-35932). |
| 10.4** | Loan and Security Agreement, dated October 12, 2018, by and between Western Alliance Bank and Arcturus Therapeutics, Inc. Incorporated by reference to Exhibit 10.1 to the Company's Report of Foreign Private Issuer on Form 6-K filed on October 15, 2018 (File No. 001-35932). |
| 10.5** | 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). |
| 10.6** | Research Collaboration and License Agreement, by and between Arcturus Therapeutics, Inc. and Janssen Pharmaceuticals, Inc., dated October 18, 2017. Incorporated by reference to Exhibit 4.7 to Form 20-F filed on May 14, 2018 (File No. 001-35932). |
| 10.7** | 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). |
| 10.8** | Research Agreement, by and between Arcturus Therapeutics, Inc. and Millennium Pharmaceuticals, Inc., a wholly-owned subsidiary of Takeda Pharmaceutical Company Limited, effective December 6, 2016, as amended December 21, 2017. Incorporated by reference to Exhibit 4.9 to Form 20-F filed on May 14, 2018 (File No. 001-35932). |
| 10.9** | 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). |
| 10.10** | 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). |
| 10.11** | 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). |
| 10.12** | 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. |

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| 10.13** | 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). |
| 10.14** | 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). |
| 10.15** | Co-Development and Co-Commercialization Agreement, by and between Arcturus Therapeutics, Inc. and CureVac AG, dated January 1, 2018. Incorporated by reference to Exhibit 4.13 to Form 20-F filed on May 14, 2018 (File No. 001-35932). |
| 10.16 | Termination Agreement, by and between Arcturus Therapeutics, Inc. and CureVac AG, dated July 26, 2019. Incorporated by reference to Exhibit 10.21 to Form 10-Q filed on August 14, 2019 (File No. 001-38942). |
| 10.17** | 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). |
| 10.18** | 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). |
| 10.19 | 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). |
| 10.20** | Amended and Restated Joint Venture, Research Collaboration and License Agreement, dated as of July 14, 2018 by and between Arcturus Therapeutics, Inc. and Providence Therapeutics, Inc. Incorporated by reference to Exhibit 10.14 to the Company's Amendment No. 1 to Annual Report on Form 10-K for the year ended December 31, 2018 filed on April 10, 2019 (File No. 001-35932). |
| 10.21** | Research Collaboration Agreement, dated as of March 8, 2019 by and between Arcturus Therapeutics, Inc. and Millennium Pharmaceuticals, Inc., a wholly-owned subsidiary of Takeda Pharmaceutical Company Limited. Incorporated by reference to Exhibit 10.15 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). |
| 10.22 | 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). |
| 10.23 | 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). |
| 10.24** | 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). |
| 10.25** | Supply Agreement, dated August 17, 2020, by and between Arcturus Therapeutics, Inc. and the Israeli Ministry of Health. Incorporated by reference to Exhibit 10.32 to Quarterly Report on Form 10-Q filed on November 9, 2020 (File No. 001-38942). |
| 10.26** | Manufacturing Support Agreement, dated November 7, 2020, by and between Arcturus Therapeutics Holdings Inc. and the Economic Development Board of Singapore. Incorporated by reference to Exhibit 10.33 to Quarterly Report on Form 10-Q filed on November 9, 2020 (File No. 001-38942). |
| 10.27 | Fourth Amendment to Loan and Security Agreement, dated December 1, 2020, by and between Arcturus Therapeutics, Inc. and Western Alliance Bank. Incorporated by reference to Exhibit 10.1 to Form 8-K filed on December 7, 2020 (File No. 001-38942). |
| 10.28† | 2020 Employee Stock Purchase Plan. Incorporated by reference to Exhibit 4.3 to Form S-8 filed on August 5, 2020 (File No. 001-38942). |
| 10.29 | 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). |

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|---|---|
| 10.30* | 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). |
| 10.31 | 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). |
| 10.32** | Technology License and Technical Support Agreement, signed July 29, 2021 and effective July 30, 2021, by and between Arcturus Therapeutics, Inc. and Vinbiocare Biotechnology Joint Stock Company. |
| 10.33** | Framework Drug Substance Supply Agreement, signed July 29, 2021 and effective July 30, 2021, by and between Arcturus Therapeutics, Inc. and Vinbiocare Biotechnology Joint Stock Company. |
| 31.1* | Certification by 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.v |
| 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 June 30, 2021 formatted in Inline Extensible Business Reporting Language (Inline XBRL):<br>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<br>101.SCH Inline XBRL Taxonomy Extension Schema<br>101.CAL Inline XBRL Taxonomy Extension Calculation Linkbase<br>101.DEF Inline XBRL Taxonomy Extension Definition Linkbase<br>101.LAB Inline XBRL Taxonomy Extension Label Linkbase<br>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 of 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: August 9, 2021

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

**EXHIBIT 10.32**

**CERTAIN INFORMATION IDENTIFIED BY BRACKETED ASTERISKS ([* * *]) HAS BEEN OMITTED FROM THIS EXHIBIT BECAUSE IT IS BOTH NOT MATERIAL AND WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.**

# TECHNOLOGY LICENSE AND TECHNICAL SUPPORT AGREEMENT

This TECHNOLOGY LICENSE AND TECHNICAL SUPPORT AGREEMENT (this "***Agreement***"), with a signature date of the 29th day of July, 2021 (the "***Signature Date***"), is being entered into by and between Arcturus Therapeutics, Inc., a Delaware corporation ("***Arcturus***"), with its headquarters at 10628 Science Center Drive Suite 250, San Diego, CA 92121 and Vinbiocare Biotechnology Joint Stock Company, a company duly established under the laws of Vietnam ("***Vinbiocare***"), with its registered address at Techno Park office building, Vinhomes Ocean Park urban area, Da Ton commune, Gia Lam district, Hanoi, Vietnam. Arcturus and Vinbiocare may be referred to herein by name or individually, as a "***Party***" and collectively, as the "***Parties***."

## BACKGROUND

**WHEREAS**, Arcturus is a messenger RNA medicines company focused on the discovery, development and commercialization of vaccines and of therapeutics for rare diseases;

**WHEREAS**, Arcturus has filed, invented or licensed certain patents and patent applications with respect to a platform technology for a novel lipid-mediated delivery system called Lipid-enabled and Unlocked Nucleomonomer Agent modified RNA (LUNAR®) which works by encapsulating therapeutic nucleic acids and safely delivering them to target cells through a process called endocytosis;

**WHEREAS**, Arcturus is currently developing a vaccine candidate comprising a self-replicating (replicon) mRNA that encodes for the spike protein of 2019-nCoV formulated in a lipid nanoparticle (LNP) using the LUNAR® delivery system known as ARCT-021, intended to protect against COVID-19 caused by SARS-CoV-2 (coronavirus);

**WHEREAS**, Arcturus has a vaccine candidate known as ARCT-154 [* * *];

**WHEREAS**, Arcturus possesses certain knowledge, know-how, trade secrets, technical information, and expertise related to the manufacture of the vaccine candidates known as ARCT-021 and ARCT-154;

**WHEREAS**, Vinbiocare is representing to Arcturus that it has know-how and expertise, and resources and facilities, to promptly build out biopharmaceutical manufacturing facilities and adopt production processes for biopharmaceutical products;

**WHEREAS**, the Parties desire for Arcturus to conduct technical support for the implementation of its production processes for drug product formulation and fill/finish/lyophilization for the vaccine candidate known as ARCT-154, and to provide consulting services in connection with the build out of a manufacturing facility, and for Vinbiocare to build out a manufacturing facility and conduct drug product formulation and fill/finish/lyophilization for *inter alia* the vaccine candidates known as ARCT-154 at the facility, in accordance with cGMP standards and on the terms and conditions of this Agreement;

**WHEREAS**, Arcturus is willing to grant a license to Vinbiocare to, following Regulatory Approval, sell doses of the Vaccine for the vaccination of Vietnam residents; and

**WHEREAS**, contemporaneously with the signature of this Agreement the Parties are entering into a supply agreement setting forth some of the key commercial terms for the supply by Arcturus of Bulk Drug Substance to Vinbiocare ("***Framework Drug Substance Supply Agreement***").

**NOW, THEREFORE**, in consideration of the covenants, conditions and undertakings hereinafter set forth, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby agree as follows.

## Article 1
## DEFINITIONS

The following terms shall have the following meanings when used in this Agreement:

1.1 "***Affiliate***" means, with respect to either Party, any business entity controlling, controlled by, or under common control with such Party. For the purpose of this definition only, "control" means (a) the possession, directly or indirectly, of the power to direct the management or policies of a business entity, whether through the ownership of voting securities, by contract or otherwise, or (b) the ownership, directly or indirectly, of at least fifty percent (50%) of the voting securities or other ownership interest of a business entity.

1.2 "***Alliance Manager***" has the meaning set forth in Section 3.6.

1.3 "***Anti-Corruption Laws***" means all Applicable Laws for the prevention of fraud, kickbacks, bribery, corruption, racketeering, money laundering or terrorism, including the FCPA, each, as amended from time to time.

1.4 "***Applicable Laws***" means all laws, statutes, rules, regulations, guidelines, orders, judgments and/or ordinances of any Governmental Authority which apply to the Parties' activities, rights and obligations hereunder.

1.5 [* * *].

1.6 "***Arcturus Indemnitees***" has the meaning set forth in Section 11.2.

1.7 "***Arcturus Sensitive Manufacturing Know-How***" means any Know-How of Arcturus (or its Affiliates, contractors or partners) that relates to the [* * *].

1.8 "***Breaching Party***" has the meaning set forth in Section 15.5.

1.9 "***Bulk Drug Product***" means cGMP-conforming lipid nanoparticle pharmaceutical product formulated with the Bulk Drug Substance, but that has not been filled or finished.

1.10 "***Bulk Drug Substance***" means cGMP-conforming drug substance consisting of the messenger RNA (mRNA) compound of the Vaccine in bulk purchased by Vinbiocare from Arcturus, which drug substance is to be used in the Manufacture of Bulk Drug Product.

1.11 "***Business Day***" means any day other than a Saturday or Sunday or a day on which banks are required or authorized to be closed in (with respect to obligations of Arcturus) California, USA, or (with respect to obligations of Vinbiocare) Hanoi, Vietnam.

1.12 "***Calendar Quarter***" means the respective periods of three consecutive calendar months ending on March 31, June 30, September 30 or December 31, during the Term, or the applicable part thereof during the first or last calendar quarter of the Term.

1.13 "***cGMP***" means current Good Manufacturing Practices, including within the meaning of 21 C.F.R. Parts 210 and 211, as amended. For avoidance of doubt, the certification of the Facility by the competent Governmental Authority or WHO (World Health Organization) as meeting GMP standard after on-site pre-approval inspection (PAI) shall be sufficient to deem such Facility as cGMP compliant. For avoidance of doubt, cGMP certification by the United States FDA is not necessary for the Facility to be deemed to meet cGMP. This commencement shall not release Arcturus from its obligation to support Vinbiocare in obtaining the cGMP certificate from other Regulatory Authorities, including the United States FDA, as set forth in the Services Plan.

1.14 "***Commercialize***" means any and all activities directed to the preparation for sale of, offering for sale of, or sale of Finished Product, including activities related to marketing, promoting, distributing, and selling the Finished Product. "Commercialization" and other forms of the word "Commercialize" shall have the correlative meaning.

1.15 "***Compliance Event***" has the meaning set forth in Section 13.6.

1.16 "***Confidential Information***" has the meaning set forth in Section 14.1.

1.17 "***Control***" (including any variations such as "*Controlled*" and "*Controlling*") means, with respect to any item of Intellectual Property, the possession of the right, whether directly or indirectly, and whether by ownership, license or otherwise (other than by operation of the license grants under this Agreement), to grant a license, sublicense or other right (including the right to reference regulatory documentation) to or under such Intellectual Property as provided for herein without violating the terms of any then-existing agreement with any Third Party and without resulting in any payment obligations to a Third Party; *provided, that* intellectual property rights of an acquirer of a Party or its Affiliates in existence prior to the acquisition date, or developed after the acquisition date solely by such acquirer without use of or reference to such Party's preexisting confidential Know-How and without contribution from employees of a Party or its Affiliates other than the acquirer, shall not be deemed to be "Controlled" by such Party or Affiliate.

1.18 "***CPI***" means the Consumer Price Index-Urban Wage Earners and Clerical Workers, U.S. City Average, All Items 1982-84=100, published by the United States Department of Labor, Bureau of Labor Statistics (or its successor equivalent index), in the United States.

1.19 "***Customer***" means any Person that directly purchases Finished Product from Vinbiocare.

1.20 "***Data Protection Laws***" has the meaning set forth in Section 13.5.

1.21 "***Default Notice***" has the meaning set forth in Section 15.5.

1.22 ***"Deliverables"*** means the written deliverables specified as deliverables of Arcturus under the Services Plan.

1.23 "***Develop***" means any and all activities directed to clinical development and regulatory activities necessary to obtain Regulatory Approval of the Vaccine or the Finished Product and shall include clinical studies, clinical supplies, regulatory affairs and registration, statistical analysis and report writing of submission documents. "Develop" does not include research, nonclinical development or preclinical development. "Development" and other forms of the word "Develop" shall have the correlative meaning.

1.24 "***Dollars***" means United States dollars.

1.25 "***Dose***" means a single dose of the Vaccine.

1.26 "***Drug Substance Supply Framework Agreement***" has the meaning set forth in the Recitals.

1.27 "***Effective Date***" means the date of issuance of Certificate of Registration of Technology Transfer to be granted by Ministry of Science and Technology of Vietnam under the 2017 Technology Transfer Law of Vietnam upon the application of Vinbiocare to be submitted as soon as practicable after the Signature Date.

1.28 "***Export Control Laws***" means all applicable U.S. laws and regulations relating to (a) economic and trade sanctions and embargoes imposed by the Office of Foreign Assets Control of the U.S. Department of Treasury or (b) the export or re-export of commodities, technologies, or services, including the Export Administration Act of 1979, 24 U.S.C. §§ 2401-2420, the International Emergency Economic Powers Act, 50 U.S.C. §§ 1701-1706, the International Traffic in Arms Regulations, 22 C.F.R. parts 120-130, the Trading with the Enemy Act, 50 U.S.C. §§ 1 et. seq., the Arms Export Control Act, 22 U.S.C. §§ 2778 and 2779, and the International Boycott Provisions of Section 999 of the U.S. Internal Revenue Code of 1986 (as amended) and any foreign equivalents of the foregoing.

1.29 "***Facility***" means the facility owned or legally used by Vinbiocare located [* * *], or such other location as the Parties may agree in writing.

1.30 "***FCPA***" means the U.S. Foreign Corrupt Practices Act of 1977, as amended.

1.31 "***FDA***" means the U.S. Food and Drug Administration or any successor entity thereof having or performing substantially the same function.

1.32 "***FD&C Act***" means the U.S. Federal Food, Drug and Cosmetic Act, as amended.

1.33 "***Field***" means the prevention in humans of COVID-19 caused by SARS-CoV-2 and any variants.

1.34 "***Finished Product***" means the Bulk Drug Product Manufactured into Doses by Vinbiocare at the Facility, which product has completed fill, finish (lyophilization), labeling and packaging activities, and has undergone manufacturer's release by Vinbiocare.

1.35 [* * *].

1.36 "***Force Majeure***" has the meaning set forth in Article 16.

1.37 "***Government Official***" means (a) any officer or employee of a government or any department, agency or instrumentality of a government; (b) any Person acting in an official capacity for or on behalf of a government or any department, agency, or instrumentality of a government; (c) any officer or employee of a company or business owned or controlled by a government; (d) any officer or employee or Person acting in an official capacity for or on behalf of a public international organization or any department, agency, or instrumentality of such public international organization such as the World Bank or United Nations; (e) any political party or official thereof; and/or (f) any candidate for political office.

1.38 "***Governmental Authority***" means any court, agency, department, authority or other instrumentality of any multi-national, national, state, county, city, province or other political subdivision.

1.39 "***Healthcare Professional***" means any member of the medical, pharmacy or nursing professions or any other Person who in the course of his or her professional activities may prescribe, administer or dispense to an end-user a medicinal product.

1.40 "***IND***" means an Investigational New Drug application in the U.S. filed with the FDA or a corresponding application filed with the Regulatory Authority of a given country or group of countries.

1.41 "***Indemnitee***" has the meaning set forth in Section 11.1.

1.42 "***Indemnitor***" has the meaning set forth in Section 11.1.

1.43 "***Industry Guidelines***" means voluntary industry codes or guidelines to which a Party has publicly stated it adheres as of the Effective Date, or subsequently during the Term.

1.44 "***Information Firewall***" has the meaning set forth in Section 14.7.

1.45 "***Intellectual Property***" means each of the following: (a) copyrights, trade secrets, patent rights, supplementary patent certificates, patent extensions, know-how, concepts, database rights, and rights in trademarks and designs (whether registered or unregistered), (b) applications for registration, and the right to apply for registration, for any of the same, (c) all other intellectual property rights and equivalent or similar forms of protection existing anywhere in the world, (d) inventions, developments, methods or processes, including any intellectual property rights in the foregoing and (e) modifications or improvements to any of the items in clauses (a)-(d).

1.46 "***Know-How***" means all technical information, know-how and data, including inventions (whether patentable or not), discoveries, trade secrets, specifications, instructions, processes, formulae, materials, expertise and other technology applicable to compounds, formulations, compositions, products or to their manufacture, development, registration, use or commercialization or methods of assaying or testing them or processes for their manufacture, formulations containing them, compositions incorporating or comprising them and including all biological, chemical, pharmacological, biochemical, toxicological, pharmaceutical, physical and analytical, safety, quality control, manufacturing, preclinical and clinical data, instructions, processes, formulae, expertise and information, regulatory filings and copies thereof, relevant to the development, manufacture, use or commercialization of and/or which may be useful in studying, testing, development, production or formulation of products, or intermediates for the synthesis thereof.

1.47 "***Liabilities***" has the meaning set forth in Section 11.1.

1.48 "***Licensed Know-How***" means all Know-How (other than Licensed Patents) that are (i) Controlled by Arcturus during the Term and (ii) disclosed by Arcturus to Vinbiocare during the Term that is reasonably necessary to conduct the Manufacture of Bulk Drug Product or the Finished Product in accordance with the Process. "Licensed Know-How" excludes any Know-How relating to the Manufacture of Bulk Drug Substance or Arcturus's proprietary lipids, including [* * *].

1.49 "***Licensed Patents***" means the patents and patent applications set forth on Appendix 1 (as may be updated from time to time by Arcturus) and any other patents and/or patent applications Controlled by Arcturus or its Affiliates during the Term, issued patents resulting from such applications, and all divisionals, continuations, substitutions, reissues, extensions, registrations, patent term extensions and renewals of the foregoing that cover inventions that are reasonably necessary to conduct the Manufacture of the Finished Product in accordance with the Process. "Licensed Patents" excludes any patent rights relating to the Manufacture of Bulk Drug Substance or Arcturus's proprietary lipids, including any [* * *].

1.50 "***Licensed Technology***" means the Licensed Patents and Licensed Know-How.

1.51 "***Local MAH***" means a Person who becomes a Marketing Authorization Holder for the Vaccine in a country in the Territory pursuant to Section 6.3.

1.52 "***Manufacture***" means the processes and procedures for the manufacture of the doses of the Vaccine, including (a) the manufacture of the Bulk Drug Substance, (b) manufacture and formulation of the Bulk Drug Product, (c) fill, lyophilization and finish (inspection, labeling, packaging) of the Bulk Drug Product into Finished Product, (d) quality control of the doses of the Vaccine during the activities of (a)-(c), and (e) the storage of the doses of the Vaccine as appropriate between stages of manufacture or distribution to customers.

1.53 "***Marketing Authorization Holder***" means the Person named on a Regulatory Approval as the Person authorized to market a pharmaceutical product under such Regulatory Approval.

1.54 "***Marks***" has the meaning set forth in Section 8.5.

1.55 "***Ministry of Health***" means the Ministry of Health of Vietnam.

1.56 "***New IP***" has the meaning set forth in Section 8.2.

1.57 "***Non-Breaching Party***" has the meaning set forth in Section 15.5.

1.58 "***Notified Party***" has the meaning set forth in Section 13.6.

1.59 "***Notifying Party***" has the meaning set forth in Section 13.6.

1.60 "***Person***" means any individual, partnership, limited liability company, firm, corporation, association, trust, unincorporated organization or other entity.

1.61 "***Pharmacovigilance Agreement***" has the meaning set forth in Section 7.4(a).

1.62 "***Phase 3 Trial***" means a human clinical trial of the Vaccine that is designed to establish whether the Vaccine is safe and efficacious for its intended use, including trials that satisfy the requirements for a Phase 3 study as defined in 21 CFR § 312.21(c) (or any amended or successor regulations) and trials that satisfy the requirements of similar laws or regulations in the Territory.

1.63 "***Process***" means the processes and procedures that are taught to Vinbiocare by Arcturus as part of the Technology Support Services and used to manufacture (including without limitation, manufacturing, formulation, processing, packaging, labeling, testing, analyzing, filling, finishing and lyophilization) the Vaccine in accordance with the master batch record, including all protocols and standard operating procedure documents referenced therein, and any related validated analytical methods.

1.64 "***Product Withdrawal***" means removal of the Vaccine from the market in the Territory on grounds of public health or safety resulting in discontinuation of all or substantially all distribution of the Vaccine in such country in the Territory. Product Withdrawal does not include a Recall.

1.65 "***Protected Personal Information***" has the meaning set forth in Section 13.5.

1.66 "***Recall***" means a recall or retrieval of the Vaccine on grounds of non-conformance, public health or safety which is limited as to lot(s) or batch(es) of Vaccine in the Territory.

1.67 "***Regulatory Approval***" means, with respect to the Vaccine, the approvals and authorizations issued by the Regulatory Authority that are necessary for the importation and use of the Vaccine in the Territory for emergency, conditional or permanent use.

1.68 "***Regulatory Authority***" means any Governmental Authority responsible for granting Regulatory Approvals for the Vaccine, including FDA, Ministry of Health, and any corresponding national or regional regulatory authorities.

1.69 "***Representative***" means a Party's employees, agents and other representatives (including contractors, consultants and advisors).

1.70 "***Safety Information***" has the meaning set forth in Section 7.4(b).

1.71 "***Services***" means (i) the Technical Support Services and (ii) other consulting services relating to construction, fit out, manufacturing, supply chain, clinical, and regulatory services to be provided by Arcturus pursuant to Section 4.1.

1.72 "***Services Fee***" means the fees payable by Vinbiocare for the Services as more particularly described in Section 5.1.

1.73 "***Services Plan***" means the Services Plan attached hereto as Appendix 2.

1.74 "***Signature Date***" has the meaning set forth in the Preamble.

1.75 "***SIAC Rules***" has the meaning set forth in Section 17.8(b).

1.76 "***Steering Committee***" has the meaning set forth in Article 3.

1.77 "***Taxes***" means all taxes and duties that are assessed by any national, federal, state, local or non-U.S. governmental authority, including, without limitation, sales, use, excise, value-added and withholding taxes.

1.78 "***Technical Documentation***" means all documentation and information, in paper or electronic format (which information may include, without limitation, drawings, data, technical instructions, testing procedure and acceptance criteria, tests reports, specification requirements, and flow charts) that is Controlled by Arcturus as of the Effective Date and that memorializes or embodies the Licensed Technology that is necessary to enable Vinbiocare to Manufacture Bulk Drug Product and Finished Product at the Facility as permitted in this Agreement. A non-exhaustive list of Technical Documentation is set forth in the Services Plan is attached hereto as Appendix 2.

1.79 "***Technical Support Services***" means the technical assistance to be provided by Arcturus to Vinbiocare to Manufacture Bulk Drug Product and Finished Product in accordance with the Process, including (i) consultation and information exchange with respect to manufacturing and technical matters relating to the Manufacture of Bulk Drug Product and Finished Product, including analytical methods, and (ii) facilitating the transfer to Vinbiocare of Licensed Know-How necessary for conducting the Process for the Manufacture of Bulk Drug Product and Finished Product. Technical Support Services includes a reasonable amount of support with respect to the Licensed Technology, training, answering questions and providing advice, to help enable Vinbiocare to be ready to manufacture, have manufactured, use and Commercialize Finished Products promptly upon Validation, in each case as further described in, or consistent with, the Services Plan. **For avoidance of doubt, the Technical Support Services do not include any** [* * *]**.**

1.80 "***Technology License Fee***" is the fee payable by Vinbiocare for the use of the Licensed Technology as more particularly described in Section 5.2.

1.81 "***Term***" has the meaning set forth in Section 15.1.

1.82 "***Territory***" means Vietnam, and any other territory as the Parties mutually agree in writing.

1.83 "***Third Party***" means any Person other than Arcturus, Vinbiocare and their respective Affiliates.

1.84 "***Third Party Claim***" has the meaning set forth in Section 11.1.

1.85 "***Vaccine***" means (i) the vaccine candidate or vaccine product known as ARCT-021 or ARCT-154 as more particularly described in the Preamble or (ii) a Variant Vaccine if selected in accordance with Section 2.6.

1.86 "***Validation***" means that the Facility has been commissioned and validated (including passing the Pre-Approval Inspection (PAI) for Finished Product) with respect to the ARCT-154 Vaccine or ARCT-021, whichever occurs earlier, in accordance with Applicable Laws and cGMP.

1.87 "***Variant Vaccine***" means a vaccine candidate or vaccine product, other than ARCT-021 ARCT-154, that (i) is a vaccine candidate comprising a self-replicating (replicon) mRNA that encodes for the spike protein of 2019-nCoV formulated in a lipid nanoparticle (LNP) using the LUNAR delivery system, (ii) is owned and developed by Arcturus, (iii) [* * *].

1.88 "***Vinbiocare Indemnitees***" has the meaning set forth in Section 11.1.

## Article 2
## LICENSE

2.1 Exclusive License of Technology. Subject to the terms and conditions of this Agreement, Arcturus hereby grants to Vinbiocare an exclusive (even as to Arcturus), personal, non-transferable (including to Affiliates), non-sublicensable (except as set forth in Section 2.4) license to use the Licensed Technology to Manufacture the Bulk Drug Product and Finished Product in the Territory at the Facility solely (a) in accordance with the Process and (b) using Bulk Drug Substance purchased from Arcturus.

2.2 Commercialization by Vinbiocare. Vinbiocare shall Commercialize such Finished Product solely for supply within the Territory and for use within the Territory. [* * *].

2.3 Restrictions. Notwithstanding any other provision of this Agreement, Vinbiocare has no right to supply or to manufacture (a) Bulk Drug Substance or (b) any proprietary Arcturus lipids. Without limiting any other restrictions in this Agreement, Vinbiocare shall not, directly or indirectly, use or disclose any Licensed Technology for the development, manufacture or commercialization of any materials, products or product candidates anywhere in the world other than as expressly permitted herein.

2.4 Sublicensing or Subcontracting by Vinbiocare.

(a) Vinbiocare may grant sublicenses to Affiliates of the license granted by Arcturus in Section 2.1 and may subcontract any Commercialization activities under this Agreement to Affiliates or third parties provided that at least twenty (20) days prior to sublicensing or subcontracting, Vinbiocare shall provide a written notice to Arcturus. If Vinbiocare grants such a sublicense or subcontract, Vinbiocare shall cause all of the applicable terms and

conditions of this Agreement to apply to the Affiliate, sublicensee or subcontractor. A copy of such sublicense or subcontract agreement shall be made available to Arcturus upon request (including an accurate English translation). Save as expressly permitted in this Section 2.4 Vinbiocare may not grant any sublicense or subcontract any Manufacturing activities under this Agreement to any third party in each case unless and until such sublicense or subcontract has been approved in writing by Arcturus.

(b) Without limiting the foregoing, Vinbiocare shall be responsible for the actions of its Affiliates, sublicensees and subcontractors, and any breach of the terms of this Agreement by a sublicensee or subcontractor of Vinbiocare shall be deemed to be a breach by Vinbiocare.

2.5 No Implied Licenses. Except as otherwise expressly specified in this Agreement, Vinbiocare shall not have any license or other right in and to Intellectual Property of Arcturus.

2.6 Variant Vaccine. From time to time, Vinbiocare may elect to include Variant Vaccine(s), if any, as a Vaccine by providing written notice to Arcturus, in which case such Variant Vaccine shall be deemed to be a Vaccine for purposes of this Agreement and no additional license fees shall be due or payable to Arcturus with respect to such selection; provided, however, that Arcturus shall have sole authority to control all Development activities with respect to such Variant Vaccine. Notwithstanding anything else in this Agreement, Arcturus shall have no obligations to initiate or continue development or commercialization of any Variant Vaccine even after such Variant Vaccine is deemed to be a Vaccine. In the event that Vinbiocare does elect to add a Variant Vaccine, the Parties shall discuss in good faith any changes to the Services Plan that might be necessitated by such change if the Variant Vaccine is added prior to Validation of the Facility. [* * *]. For avoidance of doubt, the addition of a Variant Vaccine as a Vaccine shall not extend the term of this Agreement or extend Arcturus's obligations to provide Services.

2.7 [* * *].

## Article 3
## GOVERNANCE

3.1 Steering Committee. The Parties shall establish a steering committee ("***Steering Committee***") within thirty (30) days after the Effective Date to provide a forum for the exchange of Development and Manufacturing information between the Parties so as to enable the Parties to fulfil their obligations under this Agreement and enhance the commercial success of the Finished Product, but excluding Commercialization (which shall be the sole responsibility of Vinbiocare except to the extent that any decision on Commercialization could have a material adverse impact on the development of or regulatory submissions for the Vaccine, or Commercialization of the Vaccine, outside of the Territory, potential liabilities of Arcturus or on any Intellectual Property or Intellectual Property strategies of Arcturus in which case such decision will be discussed before the Steering Committee prior to implementation).

3.2 Responsibilities and Function: The Steering Committee shall have the following responsibilities and perform the following functions:

(a) Discuss information provided by Arcturus with respect to updates on the Development of the Vaccine (including reasonable details of any ongoing clinical trial);

(b) Discuss, facilitate and coordinate the exchange of information between the Parties relating to Manufacture to include details of Arcturus's existing vendor relationships with a view

to enabling Vinbiocare to enter into direct relations with those vendors, subject to confidentiality obligations of Arcturus;

(c) Discuss regulatory strategies and submissions and Regulatory Approval with respect to the Territory;

(d) Discuss Drug Substance supply strategies;

(e) Receive Vinbiocare's reports on medical affairs activities;

(f) Agree to a procedure for exchange of information relating to serious adverse events (in addition to pharmacovigilance activities set forth in this Agreement);

(g) First line resolution of any issues or disputes arising out of this Agreement and/or the Framework Drug Substance Supply Agreement including recovery of costs and expenses per Section 5.2; and

(h) Such other responsibilities as may be mutually agreed in writing by the Parties from time to time.

3.3 Representatives. The Steering Committee shall be co-chaired by a representative of Arcturus and a representative of Vinbiocare. Each Party shall be entitled to appoint two (2) representatives to the Steering Committee, or such other equal number of representatives as may be agreed by the Parties. Each Party shall designate its initial representatives to the Steering Committee. Each Party shall be free to change its Steering Committee representatives on notice to the other Party or to send a substitute representative to any Steering Committee meeting; provided, however, that each Party shall ensure that at all times during the existence of the Steering Committee, its representatives to the Steering Committee are appropriate in terms of expertise and seniority (including at least one (1) member of senior management) for the then-current stage of Manufacture and Commercialization of the Vaccine and have sufficient authority to act on behalf of such Party with respect to matters within the purview of the Steering Committee.

3.4 Committee Administration.

(a) The representatives of the Steering Committee shall agree on the schedule for meetings, provided that there shall be at least one (1) meeting per Calendar Quarter during calendar years 2021, 2022 and 2023 and more frequently if the Parties deem appropriate and at least one (1) meeting per calendar year thereafter.

(b) Either Party may request an emergency meeting upon reasonable advance notice to the other Party.

(c) A representative of the Party hosting a meeting shall serve as secretary of that meeting. The secretary of the meeting shall prepare and distribute to all representatives draft minutes of the meeting following the meeting to allow adequate review and comment. Such minutes shall provide a description in reasonable detail of the discussions held at the meeting and a list of any actions, decisions or determinations approved by the Steering Committee. Minutes of the meeting shall be approved or disapproved, and revised, as necessary. The final minutes of the Steering Committee meeting shall be provided to the Alliance Managers.

(d) The location of Steering Committee meetings shall be conducted primarily by means of telephone conference call or videoconference. If a Party's representative is unable to attend a meeting, such Party may designate an alternate to attend such meeting in place of the absent representative. In addition, each Party may, with the consent of the other Party (which shall not be unreasonably withheld), invite non-voting employees and consultants or scientific advisors, to attend meetings.

3.5 Decision-Making. Decisions of the Steering Committee shall require the affirmative vote of each co-chair. If a co-chair is unable to attend a Steering Committee meeting, he or she may act through a substitute who is a representative of the Steering Committee by notice to the other Party provided that (I) [* * *]. For avoidance of doubt, the Steering Committee shall not have any authority to approve or require the approval of any Development (or regulatory strategies) or Manufacturing activities of Arcturus.

3.6 Alliance Managers. Each Party shall appoint a business representative who possesses a general understanding of the relevant technical, business and legal issues to act as its alliance manager hereunder (each, an "***Alliance Manager***"). The Alliance Managers shall be responsible for creating and maintaining collaborative, efficient and responsive communication within and between the Parties, and for day-to-day management of operational matters other than matters within the remit of the Steering Committee. The Alliance Managers shall have no authority to modify this Agreement or waive any non-compliance with its terms. Alliance Managers may attend Steering Committee and subcommittee meetings as observers.

3.7 Limitations of Authority. The Steering Committee and the Alliance Managers shall have solely the powers expressly assigned to them in this Article 3 and elsewhere in this Agreement. Neither the Steering Committee nor an Alliance Manager shall have any power to amend, modify, or waive compliance with this Agreement.

## SERVICES

4.1 Provision of Services by Arcturus. Following payment of the Upfront Fee, Arcturus will commence and use the best reasonable efforts to provide the Services to help Vinbiocare to establish a cGMP Facility (as applicable from time to time) capable of inter alia producing up to two hundred million (200,000,000) doses of Finished Product per year, in accordance with the scope and estimated timetable contained in the Services Plan. Subject to the foregoing, the Services will include the use of reasonable efforts to provide the following:

(i) assistance through to Validation to help Vinbiocare to establish readiness of the Facility for the operation of the Process;

(ii) the Technical Support Services;

(iii) delivery of the Deliverables to Vinbiocare; and

(iv) assist Vinbiocare in establishing relationships with vendors identified by Arcturus for the purchase by Vinbiocare of [* * *].

Vinbiocare may, at its option, determine to increase the capacity of the Facility [* * *].

[* * *]

In the course of the Services, Arcturus shall supply Vinbiocare with the Know-How that it owns or controls that is necessary for Vinbiocare to establish the Facility and to Manufacture the Finished Product in accordance with this Agreement.

4.2 Assumptions.

(a) Vinbiocare acknowledges and agrees that Arcturus's provision of the Services assumes [* * *].

(b) Arcturus's obligations to deploy personnel outside of the United States shall be limited as set forth in Section 5.11(d).

4.3 Health and Safety Rules. Vinbiocare shall implement and ensure compliance of all health and safety rules and regulations and any other reasonable security requirements in connection with the build out and operation of the Facility.

4.4 Technical Documentation. Vinbiocare shall inspect all Technical Documentation delivered or supplied by Arcturus in a timely manner following receipt thereof. If Vinbiocare finds any Technical Documentation to be missing, incorrect or incomplete or has any other issue in relation to the Technical Documentation, then it shall promptly inform Arcturus of such fact in writing and specify the missing, incorrect or incomplete Technical Documentation or list any other issue in relation to the Technical Documentation.

4.5 Arcturus Subcontractors. Arcturus may engage subcontractors (including consultants) to conduct the Services. Arcturus shall require such subcontractors to agree to written obligations of confidentiality consistent with this Agreement. Without limiting the foregoing, Arcturus shall be responsible for the actions of its subcontractors, and any breach of the terms of this Agreement by a subcontractor of Arcturus shall be deemed to be a breach by Arcturus.

4.6 Drug Substance for Qualification Purposes. Arcturus will supply, [* * *]. Any amounts of Bulk Drug Substance above [* * *] of ARCT-154, and any amounts of Bulk Drug Substance of ARCT-021 or a Variant Vaccine, required for any activities related to Manufacture using Licensed Technology, facility build-out or any process qualifications shall be supplied by Arcturus at a price of [* * *], which shall be paid by Vinbiocare within [* * *] days of invoice therefor. All such Bulk Drug Substance shall be delivered EXW (Incoterms 2020) at the shipping dock of Arcturus or its contractor (which is in [* * *]), and Vinbiocare shall be responsible for cost of cold chain, export formalities, carriage and insurance.

4.7 Vinbiocare Responsibilities.

(a) Vinbiocare shall make its personnel knowledgeable in the art available to Arcturus as reasonably requested from time to time to ensure that Vinbiocare is able to implement the Technical Documentation. Vinbiocare will perform all of its duties applicable to the Services (including implementation of the Process) and to the Facility build out and technology transfer, including as described in the Services Plan, diligently and in good faith, and will cooperate with Arcturus by providing all information and materials, and taking all actions, in each case as appropriate and as requested by Arcturus to achieve the objectives of the Services. Vinbiocare acknowledges that Arcturus's ability to perform the Services is conditional upon such performance and cooperation, and that Arcturus shall have no liability for its inability to perform or complete the Services caused, in whole or in part, by Vinbiocare's actions or omissions. Any delay due to Vinbiocare or its personnel shall appropriately and equitably extend the timeframe for the Services.

(b) Vinbiocare represents and warrants to Arcturus that (i) [* * *]. Without limiting the foregoing, Vinbiocare shall be responsible for all certification activities for the Facility, including equipment and operating procedures, under Arcturus guidance, except as expressly and specifically set forth in this Agreement. Vinbiocare shall procure the Facility at its own cost and expense, and shall pay for all modifications and improvements to the Facility as reasonably necessary to Manufacture the Finished Product pursuant to this Agreement.

## FINANCIAL TERMS

5.1 Upfront Fee. Vinbiocare shall pay Arcturus a nonrefundable, non-creditable upfront fee of [* * *] ("***Upfront Fee***"), which consists of [* * *].

5.2 Royalty. In addition to the Technology License Fee, with respect to the license granted under Article 2 Vinbiocare shall pay to Arcturus [* * *] for each Dose of Finished Product which is manufactured (i.e., has completed manufacturer's release).

5.3 Due Date for Royalties. Vinbiocare will pay to Arcturus earned royalties for each [* * *] within [* * *] days of expiry of that [* * *].

5.4 Royalty and Sales Statement. As soon as possible, and not later than [* * *] days after the expiry of each calendar quarter, Vinbiocare shall provide Arcturus with a statement containing:

(a) number of Doses manufactured in that calendar quarter (including copies of relevant documentation); and

(b) total amount or royalties due for that calendar quarter including the method of calculation.

5.5 Verification of Royalty. Vinbiocare shall permit an independent accountant designated by Arcturus on reasonable notice to audit and/or inspect the accounts, books, vouchers and records of Vinbiocare, including without limitation, records of the manufacture of Doses and all other matters directly or indirectly relevant to the calculation of the amount of royalty due and, where manufacture of Doses have been made by Vinbiocare's Affiliates or sublicensees or subcontractors, Vinbiocare shall procure that the said audit/inspection shall extend to the accounts, books, vouchers and records of such Affiliate, sublicensee or subcontractor in order to verify the accuracy of the royalty statement provided by Vinbiocare hereunder. Such audit/inspection may be made notwithstanding termination of this Agreement while any outstanding claim remains unsettled in the view of either Party. If the audit/inspection reveals an underpayment, then Vinbiocare shall forthwith make good such underpayment together with interest thereon calculated pursuant to Section 5.13 for the period commencing on the date that the payment first became due and ending on the date when payment together with accrued interest is actually received in full by or on behalf of Arcturus; provided always that such payment shall be made within [* * *] days of revelation of underpayment pursuant to such audit/inspection. If such underpayment shall exceed [* * *] of the actual royalty reported by Vinbiocare for any quarter period audited, then Vinbiocare shall reimburse Arcturus on demand the cost of such audit/inspection on a full indemnity basis.

5.6 Royalty Obligation to Survive Termination. Upon and after the termination of this Agreement Vinbiocare shall remain obligated to Arcturus for royalties with respect to manufacture of the Doses.

5.7 Termination Report and Payment. Within forty-five (45) days after the date of termination of this Agreement, Vinbiocare shall make a final report and payment to Arcturus.

5.8 Fees for Services. Except as otherwise expressly and specifically set forth in this Agreement, Vinbiocare shall be responsible for all costs and expenses of the Services and build out of the Facility, including of equipment, supplies, and materials. Vinbiocare shall be responsible for all amounts charged by third parties to Arcturus (or its Affiliates) in connection with the Services, including any consultants or contractors engaged by Arcturus, provided that the use of such third parties services is approved in advance by Vinbiocare (which approval shall not be unreasonably withheld or delayed). Vinbiocare shall be responsible for all costs incurred by Arcturus for its direct, out of pocket travel, lodging and meals expenses reasonably incurred in performing the Services, and for such costs Arcturus shall pay the costs and receive reimbursement from Vinbiocare. In addition:

(a) For conduct of Services until the Validation, Arcturus shall not charge for up to [* * *] Arcturus employee full-time equivalents (FTEs) in the conduct of the Services. Any additional Arcturus employee FTEs utilized to provide Services during that period shall be charged to Vinbiocare at an annual rate of [* * *]. For avoidance of doubt, one (1) FTE may consist of the time of multiple Arcturus employees, as determined by Arcturus. Vinbiocare acknowledges that Arcturus estimates, as of the Signature Date, trying to deploy approximately [* * *].

(b) Any Services conducted by Arcturus employees after Validation, shall be at a rate of [* * *] per hour; provided that Arcturus may adjust this hourly rate upon [* * *] days' prior notice to Vinbiocare beginning on January 1, 2024, and on an annual basis thereafter based on the average percentage increase in the CPI as of December 31 of the applicable year. Where Vinbiocare is responsible for reimbursing Arcturus for its costs and expenses hereunder, such costs and expenses shall be invoiced on a pass-through basis without mark-up. Vinbiocare shall pay all Arcturus invoices within [* * *] days of receipt.

All amounts invoiced by Arcturus for the foregoing shall be paid by Vinbiocare on a monthly basis within [* * *] days of invoice from Arcturus containing reasonable levels of detail of the amount claimed. Arcturus will provide supporting documents as reasonably requested. For avoidance of doubt, the Services Fee shall not be creditable against any fees under this Agreement, including this Section 5.8.

5.9 Mode of Payment. All payments to Arcturus under this Agreement shall be made by electronic funds transfer in immediately available funds to such bank account as Arcturus may from time to time designate by notice to Vinbiocare. All payments hereunder shall be made in Dollars (United States dollars).

5.10 Invoices. The recipient of all payments hereunder shall provide an invoice which sets forth the details of the charges for each activity together with appropriate documentation. If any portion of an invoice is disputed, then payee shall pay the undisputed amounts and the Parties shall use good faith efforts to reconcile the disputed amount as soon as practicable. The payee may only dispute invoices in good faith and by providing notice of a dispute prior to the due date of payment on such invoice with a reasonably detailed description of the basis of such dispute.

5.11 Taxes.

(a) Unless otherwise agreed in writing by the Parties, the fees, reimbursements and royalties payable in connection with this Agreement excludes all Taxes (including withholding Tax), customs, duties and governmental assessments, which shall be the responsibility of Vinbiocare; provided, however, that Arcturus shall be responsible for Taxes and export duties, if any, assessed by the United States government, including Taxes based on net income of Arcturus imposed in the United States. With regards to Personal Income Tax

("**PIT**") of employees of Arcturus, Vinbiocare will bear the PIT corresponding to the Vietnam-sourced income generating during the performance of this Agreement.

(b) If any deduction or withholding tax in Vietnam (or any other taxing jurisdiction other than the United States) in respect of any Taxes is required by law to be made from the amounts payable under this Agreement, Vinbiocare shall be obliged to pay to Arcturus (by the same applicable due date) such greater sum as will leave Arcturus, after such required deduction or withholding is made, with the same amount as it would have been entitled to receive in the absence of any such required deduction or withholding obligation.

(c) [* * *].

(d) Notwithstanding anything else, in no event shall Arcturus be required to deploy personnel outside of the United States in any manner or for any periods of time that could subject Arcturus to any taxes of any government agency of the Territory or any other ex-United States government agency. In the event that, for whatever reason, a Governmental Authority in the Territory determines that the Services create a taxable presence for Arcturus (or its Affiliates) in the Territory, Vinbiocare shall reimburse Arcturus for any such amounts payable by Arcturus for such taxes.

5.12 No Set-Off. Vinbiocare shall in no case be entitled to set off or otherwise withhold or adjust any payment due to Arcturus under this Agreement in view of claims, [* * *], that Vinbiocare may have against Arcturus [* * *].

5.13 Late Payment. In the event that any payment is not received by Arcturus on or before the applicable due date, then Arcturus may, in addition to any other remedies available at equity or in law or set forth in this Agreement, at its option, charge interest on the outstanding sum from the due date at [* * *] per month (including any partial month) until paid in full (or, if less, the maximum amount permitted by Applicable Law).

5.14 Maintenance of Books/Records. Vinbiocare shall maintain and shall (with respect to its Affiliates, subcontractors and sublicensees) ensure the maintenance of accurate and up to date records and books of account during the terms of this Agreement and for the later of [* * *] years following termination.

## DEVELOPMENT, MANUFACTURE AND COMMERCIALIZATION

6.1 Development Efforts.

(a) Clinical Trials. Arcturus shall control all Development of the Vaccine in the Territory, except as otherwise expressly set forth in this Agreement or as otherwise agreed in writing by the Parties. Arcturus shall provide Vinbiocare with the results of any clinical trials on the Vaccine on or around the time that the results are considered adequate by Arcturus for filing and in the format that Arcturus determines adequate for filing.

[* * *].

[* * *].

***(b)*** Regulatory Approval. Vinbiocare will work with Arcturus to secure Regulatory Approval of the Vaccine in the Territory based on approvals, if any, obtained by Arcturus in countries

other than Territory and data from trials involving the Vaccine conducted by Arcturus. [* * *] Arcturus will use reasonable efforts to support Vinbiocare in such efforts, including to work directly with Vinbiocare and the Ministry of Health to understand and respond to Ministry of Health requirements, at Vinbiocare's cost and expense; provided, for clarity, that Arcturus shall have no obligation to prepare first draft written documents or responses for such purposes. Arcturus shall have the right to review and approve (which approval shall not be unreasonably withheld) any application for Regulatory Approval being submitted by Vinbiocare to the Regulatory Authorities in the Territory, copies of which shall be provided by Vinbiocare to Arcturus in English. Vinbiocare shall keep Arcturus reasonably informed with respect to the preparation of any applications for Regulatory Approval, including by providing English copies of drafts from time to time. Arcturus shall promptly (and in any event within [* * *] Business Days, provided that Vinbiocare keeps Arcturus updated during the process of preparing applications, including by providing drafts in English from time to time) review and respond to Vinbiocare on draft applications provided in English. Arcturus and Vinbiocare shall cooperate in good faith to enable Vinbiocare to leverage or reference any other approvals of the Vaccine anywhere in the world for purposes of Regulatory Approval in the Territory, to the extent permitted.

***(c)*** Regulatory Interactions. Vinbiocare will keep Arcturus informed of its interactions with Regulatory Authorities in the Territory relating to the Vaccine and will pay due account of any comments received by Vinbiocare from Arcturus. Arcturus shall have the right to participate in any interactions with Regulatory Authorities in the Territory relating to the Vaccine, and Vinbiocare shall give Arcturus reasonable advance notice of any such interactions. Vinbiocare shall give Arcturus copies of all correspondence with Regulatory Authorities in the Territories (including English translation copies), and Arcturus shall have the right to review and comment on any draft responses.

6.2 Licenses. As between the Parties, Vinbiocare shall be solely responsible for the distribution of the Finished Product within the Territory, shall be responsible for procuring any licenses, certifications or permits for such activities (other than licenses, certifications or permits that shall be issued in the name of Arcturus as required by the laws of Vietnam) and shall comply with all Applicable Laws and applicable requirements of the Regulatory Approvals in the Territory in connection therewith. Arcturus shall provide reasonable assistance.

6.3 Local MAH.

(a) Unless it is a legal requirement for Arcturus to be the Local MAH for the Vaccine for the Territory, Vinbiocare will hold the Local MAH.

(b) If Vinbiocare or a third party engaged by Vinbiocare serves as Local MAH, then Vinbiocare shall ensure that the Local MAH complies fully with all of the responsibilities of a Marketing Authorization Holder under applicable Laws. The Local MAH shall provide to Arcturus copies of all draft and actual filings and other correspondence with the relevant Regulatory Authority and Arcturus shall have the right to approve (within [* * *] Business Days, provided that Vinbiocare keeps Arcturus updated during the process of preparing applications, including by providing drafts in English from time to time) such filings and other correspondence (provided in English) before submissions to the relevant Regulatory Authority. To the extent permitted by Applicable Laws, the Local MAH will adhere to all recommendations of Arcturus relating thereto. The Local MAH shall hold the Regulatory Approval and any pricing approvals for the Vaccine in trust for Arcturus and shall promptly assign and transfer such Regulatory Approval and pricing approvals to

Arcturus or Arcturus's designee free of charge upon the termination of this Agreement (in whole or for the relevant country) or, if earlier, upon Arcturus's written request. Each Local MAH shall, without charge, execute all documents, make all submissions to the relevant Regulatory Authority, and provide copies of all communications and data that are necessary or otherwise reasonably required by Arcturus to effect the transfer of any Regulatory Approval and pricing approvals held by such Local MAH to Arcturus or Arcturus's designee.

6.4 Manufacturing Procurement and Release. Other than Bulk Drug Substance, Vinbiocare is exclusively responsible for procuring all raw materials and components necessary to Manufacture the Finished Product. [* * *].

Arcturus shall permit an independent accountant designated by Vinbiocare and acceptable to Arcturus on reasonable notice to audit and/or inspect the accounts, books, vouchers and records of Arcturus relevant to confirmation of the calculation of the proprietary lipid price. Such audit/inspection may be made notwithstanding termination of this Agreement while any outstanding claim remains unsettled in the view of either Party. If the accountant determines that the amount that should have been paid by Vinbiocare for the relevant proprietary lipids was more than the amount actually paid then Arcturus shall pay to Vinbiocare such differential amount within [* * *] days of the date of the determination by the accountant. If such differential amount shall exceed the greater of (i) [* * *] of the actual amount paid by Vinbiocare for any order audited or (ii) [* * *], then Arcturus shall reimburse Vinbiocare on demand the cost of such audit/inspection on a full indemnity basis.

For clarity, the supply of proprietary lipids would be on the same terms and conditions as the term and conditions of supply of Bulk Drug Substance to the extent reasonably practicable. [* * *].

6.5 Monitoring. Vinbiocare shall permit personnel of Arcturus to be present at the Facility for the purposes of monitoring and observing the Facility's operations, and for quality purposes to ensure compliance with the terms of this Agreement. Batch records will be made available. Arcturus will give reasonable prior notice and will not exercise this right more than once in any twelve month period.

6.6 Manufacturing Process. Vinbiocare shall not modify the Process, without the prior written approval of Arcturus. However, Arcturus shall promptly notify Vinbiocare if there are any updates / changes in the manufacturing Process.

6.7 Commercialization. As between the Parties, Vinbiocare shall be responsible for its Commercialization of the Finished Product in the Territory and shall be consistent with Arcturus's global commercialization (including branding) strategies, as communicated by Arcturus to Vinbiocare from time to time.

6.8 Reporting. Vinbiocare shall keep the Steering Committee fully informed regarding the progress and results of its Commercialization activities for the Vaccine throughout the Territory, including a quarterly and an annual review of results versus goals. Without limiting the foregoing, Vinbiocare shall provide Arcturus on a quarterly basis the following sales data of the Finished Product: (i) on a customer-by-customer basis, the quantity sold to such customer and pricing provided to each customer, and (ii) a summary of any other event that has material impact on the commercialization efforts of the Finished Product.

6.9 Medical Affairs Activities.

(a) Vinbiocare shall be responsible, at its cost, for medical affairs activities in the Territory, including providing appropriately qualified medical science liaisons (or the local equivalent), medical information and medical education programs and medical publications in the Territory, and attending relevant medical or scientific meetings and congresses, and shall allocate sufficient, appropriately qualified personnel and resources to conduct such activities, as further set forth herein. Vinbiocare shall keep the Steering Committee apprised of its medical affairs activities; in addition, if Arcturus is the Local MAH, then medical affairs activities shall be subject to the approval of Arcturus.

(b) Vinbiocare shall appropriately disseminate medical information in accordance with Applicable Laws and in a manner consistent with any medical affairs materials provided by Arcturus to Vinbiocare in writing, if any (provided such materials provided by Arcturus are compliant with Applicable Laws). Through discussion by the Steering Committee or an appropriate project team, Vinbiocare shall discuss and align with Arcturus regarding Vinbiocare's medical affairs activities relating to the Vaccine in the Territory. Through the Steering Committee, Vinbiocare shall keep Arcturus informed on its medical affairs activities relating to the Vaccine in the Territory and the Parties shall discuss aspects relevant to the scientific communications and activities pertaining to the Vaccine in the Territory.

(c) Vinbiocare shall ensure that requests for information by Healthcare Professionals are answered in an appropriate, accurate and lawful manner by appropriately qualified personnel. Requests for information that are inconsistent with the approved prescribing information (product label), for the relevant country shall be handled by the medical affairs personnel only. Vinbiocare shall provide to Arcturus copies of all such materials (translated into English) that Vinbiocare plans to utilize in such activities, and Arcturus shall have the right to review, comments and approve such materials.

6.10 Compliance Matters. Vinbiocare represents and certifies that all of its representatives and subcontractors have never been and are not currently debarred pursuant to the US Generic Drug Enforcement Act of 1992, 21 U.S.C. §335(a), as amended, or any similar law or regulation (collectively "***Debarred***"), excluded by the US Office of Inspector General pursuant to 42 U.S.C. § 1320a-7, et seq. or any agency from participation in any health care program (collectively "***Excluded***") or otherwise disqualified or restricted by the FDA pursuant to 21 C.F.R. 312.70, or by any Regulatory Authority in the Territory under any analogous laws (collectively "***Disqualified***"). Vinbiocare shall not employ any Debarred, Excluded or Disqualified Vinbiocare representatives or allow any Debarred, Excluded or Disqualified subcontractor to be involved in any clinical trial relating to this Agreement. Vinbiocare shall notify Arcturus promptly if any Vinbiocare representatives or subcontractors are threatened to become Debarred, Excluded or Disqualified.

## SAFETY AND PHARMACOVIGILANCE

7.1 Adverse Event Reporting. Arcturus shall own and manage the global safety database for the Vaccine, and shall control the reporting of all relevant adverse drug reactions/experiences, including those associated with quality complaints, and aggregate safety data relating to the Vaccine, outside the Territory. Vinbiocare shall be responsible for the timely reporting of all relevant adverse drug reactions/experiences relating to the Territory, including those associated with quality complaints, and aggregate safety data relating to the Vaccine, in accordance with local pharmacovigilance legislation within the Territory, and subject to medical review/oversight from Arcturus, as may be more specifically described in the Pharmacovigilance Agreement.

7.2 Global Pharmacovigilance. Arcturus shall control global medical surveillance, risk management, global medical literature review and monitoring, and responses for the Vaccine to the appropriate Regulatory Authorities outside the Territory. Arcturus shall control the interpretation, in light of Arcturus's global pharmacovigilance data, of adverse events in the Territory of which Arcturus becomes aware, including adverse events reported to Arcturus by Vinbiocare. Vinbiocare shall be responsible for local medical surveillance, risk management, medical literature review and monitoring within the Territory, and for responses to the Ministry of Health, subject to medical review/oversight from Arcturus, as may be more specifically described in the Pharmacovigilance Agreement. Vinbiocare shall provide an English-translated copy of the final responses to Regulatory Authorities to Arcturus, if the original responses were not written in English.

7.3 Vinbiocare Risk Management. Vinbiocare shall implement and execute local Vaccine-specific risk management activities, in collaboration with Arcturus's pharmacovigilance department, that are aligned with Arcturus's global risk management strategies.

7.4 Pharmacovigilance.

**(a)** Further details of the Parties' respective pharmacovigilance obligations and responsibilities (e.g., signal management, case processing and reporting, aggregate reporting, risk management, health authority responses, safety data exchange, etc.) shall be set forth in a pharmacovigilance agreement that will be agreed by the Parties (and their respective Affiliate(s), as appropriate) within [* * *] days of request from either Party (as it may be amended by the Parties from time to time, the "***Pharmacovigilance Agreement***"). In the event of a conflict between the terms of the Pharmacovigilance Agreement and the terms of this Agreement, the provisions of this Agreement shall govern; provided, however, that the Pharmacovigilance Agreement shall govern in respect of pharmacovigilance, including safety and risk management, matters. In any event, no commercial launch or sale of the Vaccine shall take place in the Territory until the Parties have entered into the Pharmacovigilance Agreement.

(b) Prior to executing the Pharmacovigilance Agreement, the Parties agree to work together in good faith to coordinate activities regarding pharmacovigilance with respect to the Vaccine in accordance with this Article 7 (Safety and Pharmacovigilance), including by exchanging standard operating procedures and other information relevant to such pharmacovigilance activities as agreed by the Parties. Without limiting the foregoing, prior to executing the Pharmacovigilance Agreement, if Vinbiocare receives reports of adverse drug reactions/experiences or safety data relating to the Vaccine ("***Safety Information***") [* * *]. Vinbiocare shall not respond to any Regulatory Authority request or inquiry relating to the safety of the Vaccine without discussing the issue with and getting alignment with

Arcturus. Vinbiocare shall transmit Safety Information and Regulatory Authority inquiries concerning safety of the Vaccine to Arcturus as set forth in the Pharmacovigilance Agreement.

7.5 Recalls/Withdrawals.

(a) Notice. Each Party shall make every reasonable effort to notify the other Party promptly following the first Party's determination that any event, incident, or circumstance has occurred that may result in the need for a Product Withdrawal anywhere in the world (including in the Territory) or a Recall in the Territory. Such Party shall include in such notice the reasoning behind such determination, and any supporting facts.

(b) Product Withdrawal. With respect to a Product Withdrawal within the Territory, immediately after receipt of such notification, the Steering Committee (or its co-chairpersons) shall discuss and, unless the Product Withdrawal is mandated by a Regulatory Authority, shall attempt to agree on whether to voluntarily implement the Product Withdrawal within the Territory. If a Regulatory Authority mandates that the Product Withdrawal within the Territory be implemented then Vinbiocare, in consultation and coordination with Arcturus, shall initiate the Product Withdrawal within the Territory as and to the extent mandated by the Regulatory Authority and in compliance with Applicable Laws. In the case of a Product Withdrawal that is not mandated by a Regulatory Authority, if the Steering Committee (or its co-chairpersons) fail(s) to agree within a reasonably appropriate time period (depending upon the circumstances) whether to voluntarily implement or undertake a Product Withdrawal within the Territory, then Arcturus shall have the right to make the determination whether or not to voluntarily implement such Product Withdrawal within the Territory; provided that, to the extent practicable prior to deciding to initiate a Product Withdrawal within the Territory, Arcturus shall consult with Vinbiocare's Steering Committee representative, and shall consider Vinbiocare's reasonable comments in good faith. Notwithstanding that Arcturus shall have the right to decide whether or not to initiate a voluntary Product Withdrawal, if Vinbiocare, as the distributor of Vaccine in the Territory, is responsible for carrying out and physically recovering the withdrawn Vaccine in the Territory, Vinbiocare shall carry out such Product Withdrawal activities in coordination and consultation with Arcturus, in a manner which enables Arcturus to meet its regulatory requirements as expeditiously as possible, and in compliance with all Applicable Laws.

(c) Recall. If a Regulatory Authority mandates that a Recall be implemented or undertaken by Vinbiocare in the Territory, Vinbiocare, in consultation and coordination with Arcturus, shall initiate the Recall to the extent mandated by the Regulatory Authority and in compliance with Applicable Laws. With respect to a Recall in the Territory that is not mandated by a Regulatory Authority, (a) the Parties' Steering Committee co-chairs shall discuss and attempt to agree on whether to voluntarily implement the Recall and (b) if the Parties' Steering Committee co-chairs fail to agree within a reasonably appropriate time period (depending upon the circumstances), then Arcturus shall have the right to make the determination whether or not to voluntarily implement a Recall in the Territory.

(d) Expenses. All costs and expenses of any Recall or Product Withdrawal in the Territory shall be [* * *].

## INTELLECTUAL PROPERTY

8.1 Arcturus Existing Intellectual Property. As between the Parties, all Intellectual Property rights that are owned or controlled by Arcturus as of the Effective Date shall remain under the ownership or control of Arcturus throughout the Term and thereafter. For clarity, all Intellectual Property related to the Vaccine, the Bulk Drug Substance, the Bulk Drug Product, Finished Product, or the Manufacture, storage or preparation thereof, that exist as of the Effective Date shall be deemed Arcturus's Intellectual Property and Arcturus shall retain, own and have the exclusive right, title and interest in and to all such Intellectual Property.

8.2 New Intellectual Property. All new Intellectual Property that is generated, developed, conceived or reduced to practice in the course of activities related to this Agreement that (a) is related to [* * *] or (b) that is [* * *] (collectively, "***New IP***"), shall be deemed to be [* * *] Intellectual Property, and shall be the exclusive property of [* * *]. [* * *] shall, and does hereby, assign and shall cause its Affiliates and its and their Representatives, as applicable, to assign to [* * *], without additional compensation, all right, title and interest that it and they may have in and to any New IP. [* * *] agrees to assist [* * *] in every proper way (including becoming a nominal party and having [* * *]'s employees and agents execute any documents) to evidence, record and perfect the assignment and to apply for and obtain recordation of and from time to time enforce, maintain and defend such proprietary right. [* * *].

8.3 Grant back. [* * *].

8.4 Licensed Patents. As between the Parties, Arcturus shall have sole control over the filing, prosecution and maintenance of the Licensed Patents.

8.5 Marks. Arcturus, after reasonable consultation with Vinbiocare, may control the selection of all trademarks for use in connection with the sale or marketing of Finished Products in the Territory in the Field (the "***Marks***"). Arcturus shall own such Marks and any goodwill accruing therein and shall grant a fully paid-up license (as mentioned in Section 5.1) to Vinbiocare to use the same for any purpose connected with this Agreement, unless the Parties mutually agree upon a Mark for the Finished Product in the Territory, in which case such Mark shall be jointly owned by the Parties.

8.6 Third Party Infringement. Each Party shall promptly report in writing to the other Party during the Term any known (i) infringement of any of the Licensed Patents or Marks in the Territory or (ii) unauthorized use of any of the Licensed Technology in the Territory of which such Party becomes aware.

8.7 Corporate Trademarks and Logos. Each Party and its Affiliates shall retain all right, title and interest in and to its and their respective corporate trademarks, house marks, and corporate names or logos. Neither Party shall, without the other Party's prior written consent, use any such trademarks, house marks, corporate names or logos of the other Party, or marks confusingly similar thereto, in connection with such Party's Commercialization of Finished Products under this Agreement.

## WARRANTIES

9.1 Mutual Warranties. Each Party hereby warrants to the other Party as of the Signature Date as follows:

(a) Corporate Existence and Power. It is a corporation duly organized, validly existing, and in good standing under the laws of the jurisdiction in which it is incorporated, and has full corporate power and authority and the legal right to own and operate its property and assets and to carry on its business as it is now being conducted and as contemplated in this Agreement, including the right to grant the licenses granted by it hereunder.

(b) Authority and Binding Agreement. (a) It has the corporate power and authority and the legal right to enter into this Agreement and perform its obligations hereunder; (b) it has taken all necessary corporate action on its part required to authorize the execution and delivery of this Agreement and the performance of its obligations hereunder and (c) this Agreement has been duly executed and delivered on behalf of such Party, and constitutes a legal, valid, and binding obligation of such Party that is enforceable against it in accordance with its terms.

(c) No Debarment. Neither such Party nor any Affiliate thereof is debarred, has been convicted, or is subject to debarment or conviction pursuant to Section 306 of the FD&C Act.

9.2 Additional Warranties of Arcturus. In addition, Arcturus warrants to Vinbiocare as of the Signature Date that:

(a) No Inconsistent Grants. There is no Third Party license agreement in effect which is inconsistent with the rights and licenses granted to Vinbiocare under Article 2.

(b) Authority to Grant License. Arcturus has the full right, power and authority to grant, has been granted any required consents, and is not prohibited by the terms of any agreement to which it is a party from granting, the licenses granted to Vinbiocare under Article 2.

(c) Confidentiality. To Arcturus's knowledge, the Licensed Know-how has been kept confidential or has been disclosed to Third Parties only under terms of confidentiality, except where the failure to keep such Licensed Know-How confidential will not have a material effect on Development or Commercialization of Finished Products in the Territory in the Field.

(d) Development In Compliance With Laws. To Arcturus's knowledge, the Development of the Vaccine has been conducted by Arcturus and its Affiliates and its subcontractors in compliance in all material respects with all Applicable Laws.

(e) Regulatory Authority. Except as would not have a material adverse effect on the Vaccine or Vinbiocare's rights under this Agreement, there are no inquiries, actions or other proceedings pending before or, to Arcturus's knowledge, threatened by any governmental authority with respect to the Vaccine, and neither Arcturus nor its Affiliates has received written notice threatening any such inquiry, action or other proceeding.

(f) Facility: [* * *].

(g) Intellectual Property. [* * *].

9.3 DISCLAIMER. Notwithstanding anything else, Arcturus makes no assurance that the Vaccine will achieve regulatory approval anywhere in the world or as to the initiation, completion or results of any Development activities. Vinbiocare acknowledges and agrees that timely and successful build out and certification of the Facility, transfer and use of the Licensed Technology, and Manufacture of Bulk Drug Product and Finished Product depends on many factors, many of which are outside of Arcturus's control, and many of which are solely within Vinbiocare's control, and that Arcturus shall not be liable or responsible for any delay or failure to implement or complete the Services, the build out of the Facility or the completion of the Services except in case the delay is attributable to gross negligence or willful breach of this Agreement by Arcturus.

9.4 No Other Representations or Warranties. EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT OR THE FRAMEWORK DRUG SUBSTANCE SUPPLY AGREEMENT, NEITHER PARTY MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, BY STATUTE OR OTHERWISE, AND EACH PARTY SPECIFICALLY DISCLAIMS ANY OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, OR EXPRESS OR IMPLIED, [* * *]. NEITHER PARTY NOR ANY OF ITS RESPECTIVE EMPLOYEES OR REPRESENTATIVES IS AUTHORIZED TO GIVE ANY WARRANTIES OR MAKE ANY REPRESENTATION ON BEHALF OF THE OTHER PARTY.

## LIMITATIONS/EXCLUSIONS OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, (A) EXCEPT WITH RESPECT TO [* * *], NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL OR PUNITIVE DAMAGES, WHETHER LIABILITY IS ASSERTED IN CONTRACT, TORT [* * *], OR ANY OTHER THEORY OR FORM OF ACTION, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY THEREOF; AND (B) [* * *]'s TOTAL LIABILITY UNDER THIS AGREEMENT IN CONNECTION WITH ANY CLAIM OR SERIES OF CONNECTED CLAIMS SHALL NOT EXCEED [* * *].

## INDEMNIFICATION

11.1 Indemnification by Arcturus. Arcturus hereby agrees, at its sole cost and expense, to defend, hold harmless and indemnify, to the extent permitted by Applicable Laws, (collectively, "***Indemnify***") Vinbiocare and its Affiliates and their respective agents, directors, officers and employees of such Persons and the respective successors and assigns of any of the foregoing (the "***Vinbiocare Indemnitees***") from and against any and all liabilities, damages, penalties, fines, costs and expenses, including, reasonable attorneys' fees (collectively, "***Liabilities***") resulting from suits, claims, actions and demands, in each case brought by a Third Party (each, a "***Third Party Claim***") against any Vinbiocare Indemnitee and arising from or occurring as a result of [* * *].

11.2 Indemnification by Vinbiocare. Vinbiocare hereby agrees, at its sole cost and expense, to Indemnify Arcturus and its Affiliates and their respective agents, directors, officers and employees of such Persons and the respective successors and assigns of any of the foregoing (the "***Arcturus Indemnitees***") from and against any and all Liabilities resulting from a Third Party Claim against any Arcturus Indemnitee and arising from or occurring as a result of: [* * *].

11.3 Indemnification by Customers. [* * *].

11.4 Procedure. To be eligible to be indemnified hereunder, the indemnified Person (or the indemnified Party on behalf of such indemnified Person) shall provide the indemnifying Party with prompt written notice of the Third Party Claim giving rise to the indemnification obligation pursuant to Section 11.1 or Section 11.2, as applicable, and the right to control the defense (with the reasonable cooperation of the indemnified Person) or settlement any such claim; provided, however, that the indemnified Person's failure to provide such notice shall not relieve the indemnifying Party of any obligation or liability hereunder except to the extent that the indemnifying Party has suffered actual prejudice thereby; provided, further, that the indemnifying Party shall not enter into any settlement that admits fault, wrongdoing or damages without the indemnified Person's written consent, such consent not to be unreasonably withheld or delayed. The indemnified Person shall have the right to join, but not to control, at its own expense and with counsel of its choice, the defense of any Third Party Claim that has been assumed by the indemnifying Party.

## INSURANCE

Each Party shall procure and maintain insurance, including product liability insurance, with respect to its activities hereunder and which are consistent with normal business practices of prudent companies similarly situated at all times during which the Vaccine is being clinically tested in human subjects or any Finished Product is commercially distributed or sold. It is understood that such insurance shall not be construed to create a limit of either Party's liability with respect to its indemnification obligations under Article 11. Each Party shall provide the other Party with written evidence of such insurance upon request.

## COMPLIANCE DUTIES

13.1 Vinbiocare shall obtain and keep current all licenses, certificates, approvals and permits of whatever nature required under all Applicable Laws for the fulfilment of Vinbiocare's obligations under this Agreement.

13.2 In the performance of its obligations hereunder, Vinbiocare shall comply and shall cause its and its Affiliates' Representatives involved in the performance of this Agreement, and its sublicensees and subcontractors, to comply with all Applicable Laws.

13.3 Vinbiocare warrants that no (a) owners (b) directors, or (c) executive management members of Vinbiocare or of any of its Affiliates is a Government Official. Vinbiocare agrees to make prompt written disclosure to Arcturus of any changes to this information during the Term.

13.4 Additional Compliance Duties.

(a) Vinbiocare shall take all steps, including implementing and maintaining (at a minimum) a robust internal compliance program, so as to ensure that its business, practice and the distribution services that it performs under this Agreement are carried out in accordance with all Applicable Laws.

(b) Vinbiocare shall generally conduct its business and activities in a responsible and ethical manner. Without limiting the foregoing, Vinbiocare shall conduct its activities in a manner that is consistent with all applicable Laws, including the Anti-Corruption Laws. Vinbiocare further undertakes that none of its employees, directors or officers shall, directly or indirectly, engage in any activities that violate any Anti-Corruption Laws (i) in

order to influence official action of any government official, or (ii) with the intention of or as a condition to induce any Person to carry out a duty or function improperly or to reach a favorable decision on an improper basis, in each case in connection with the activities contemplated under this Agreement.

(c) Vinbiocare shall promptly provide Arcturus with written notice of (a) becoming aware of any violation of this Section 13.4 and of any Anti-Corruption Laws (whether related to the distribution, marketing or resales of the Vaccine or otherwise), and (b) upon receiving a formal notification that it or any of its employees, agents, directors or officers is the target of a formal investigation by any Governmental Authority for a violation of any Anti-Corruption Laws (whether related to the activities under this Agreement or otherwise). In the event of any such notice, Arcturus may, at its sole discretion, immediately terminate this Agreement and such termination shall be deemed to be a termination of this Agreement for material breach by Vinbiocare.

(d) Vinbiocare shall certify to Arcturus on an annual basis that, to the best of its knowledge:

(i) it is in compliance with Vietnamese Anti-Corruption Laws,

(ii) to the best of its knowledge, it is in compliance with all Anti-Corruption Laws,

(iii) it is in compliance with applicable rules on interactions with Healthcare Professionals and payors, including under any Industry Guidelines to the extent that they apply to the Commercialization of Finished Product; and

(iv) Vinbiocare has maintained true and accurate records necessary to demonstrate compliance with the requirements of this Article 13 (Compliance Duties).

13.5 At times, either Party may provide the other Party with personal information that falls under the protection of certain data security and privacy laws ("***Protected Personal Information***"). Without limiting the generality of this Article 13, each Party agrees to comply with all Applicable Laws relating to the use, storage, collection or other processing of such Protected Personal Information ("***Data Protection Laws***"). The Parties agree to use good faith efforts to agree upon and implement any security protocols and information handling guidelines that their respective legal advisors recommend in connection with the Parties' compliance with such data security and privacy laws.

13.6 Notice of Compliance Events. Each Party agrees that if it learns of any violation of Data Protection Laws, Regulatory Laws, Export Control Laws, or Anti-Corruption Laws by an employee or other Person that performs work under this Agreement (a "***Compliance Event***"), such Party (the "***Notifying Party***") shall promptly notify the other Party (the "***Notified Party***") in writing of such Compliance Event and the measures Notifying Party has taken and intends to take to remedy such Compliance Event and to prevent its recurrence. The Notified Party reserves the right to require the Notifying Party to prohibit the employee or other Person (as the case may be) from performing any work related to this Agreement after due consultation with Notifying Party.

## CONFIDENTIALITY

14.1 Each Party shall treat as strictly confidential any information and/or document received from the other Party or its Affiliates (or Representatives) hereunder and non-public information relating to the business or technologies of the disclosing Party or its Affiliates (all hereinafter referred to as the "***Confidential Information***"). The Licensed Technology, New IP, and any other Intellectual Property of Arcturus disclosed to Vinbiocare (or its Representatives) shall be deemed to be the Confidential Information of Arcturus. For avoidance of doubt, any information disclosed by a vendor to Vinbiocare that relates to the business or technologies of Arcturus, including to the Vaccine or proprietary lipids of Arcturus, shall be deemed Confidential Information of Arcturus. Each receiving Party shall use the Confidential Information of the disclosing Party solely for the purpose of and in accordance with this Agreement. Each Party may disclose Confidential Information of the other Party to its employees and agents and to the employees and agents of its Affiliates, and approved subcontractors solely for purposes, and only to the extent reasonably required, to facilitate the performance of such Party's obligations or exercise of its rights under this Agreement, provided that each such employee and agent and such sublicensee, subcontractor or other Third Party contractor, as applicable, has executed a written confidentiality agreement with such receiving Party containing provisions that protect the Confidential Information of the disclosing Party that are materially equivalent to, or more protective than, the provisions of this Article 14 (Confidentiality). In addition, Arcturus and Vinbiocare each agrees that the other Party may disclose its Confidential Information (a) to such other Party's legal and financial advisors, (b) as reasonably necessary in connection with an actual or potential (i) debt or equity financing of such other Party, or (ii) merger, acquisition, consolidation, share exchange or other similar transaction involving such Party and any Third Party, and (c) for any other legitimate business or legal purpose with the other Party's consent.

14.2 Notwithstanding anything else, Vinbiocare shall not disclose or provide access to, or use on behalf of, any Affiliate or Third Party any of Arcturus's Manufacturing-related Know-How or Confidential Information (including any Arcturus Sensitive Manufacturing Know-How), without the prior and specific written consent of Arcturus on a case-by-case basis. Promptly (and in any event within 30 days) following any request from Arcturus from time to time during and after the Term, Vinbiocare shall provide a certification signed by an executive officer confirming that Vinbiocare is not using any Arcturus Sensitive Manufacturing Know-How in any way or with any programs or products, except as expressly permitted under this Agreement.

14.3 Neither Party shall make Confidential Information of the other Party available to any Regulatory Authorities or other Governmental Authority without the prior written consent of the other Party, except as required by Applicable Laws, and in this case (x) solely to the extent required by such Applicable Laws (based on advice of legal counsel) and (y) only if said Regulatory Authorities and other Governmental Authority maintain confidentiality thereof.

14.4 Each Party, as receiving Party, shall be responsible for any breach of the terms of this Article 14 by any Person that receives from such receiving Party the Confidential Information of the disclosing Party.

14.5 Notwithstanding expiration or termination of this Agreement for any reason, the foregoing confidentiality and non-use obligations shall continue for a period of ten (10) years, or in perpetuity with respect to trade secrets, after expiration or termination of this Agreement. Notwithstanding the foregoing, nothing contained in this Article 14 (Confidentiality) shall in any way restrict or impair the right of either Party to use, disclose or otherwise deal with Confidential Information of the disclosing Party, which the receiving Party can demonstrate by competent written evidence:

(a) is or hereafter becomes part of the public domain through no act or omission of the receiving Party, its employees, Affiliates, sublicensees and/or subcontractors; or

(b) was in the lawful possession of the receiving Party prior to receipt of the Confidential Information from the disclosing Party; or

(c) previously was, or at any time hereafter is, provided to the receiving Party by a Third Party having the right to do so and which did not originate directly or indirectly from the disclosing Party; or

(d) at the time of disclosure, was known by the receiving Party or an Affiliate, sublicensee or subcontractor other than as a result of disclosure to such Party by the disclosing Party, or after disclosure was independently developed by the receiving Party, an Affiliate, sublicensee or subcontractor without use of the Confidential Information of the disclosing Party.

Any combination of features or disclosures will not be deemed to fall within the foregoing exclusions merely because individual features are published or available to the general public or in the rightful possession of the receiving Party unless the combination itself and principle of operation are published or available to the general public or in the rightful possession of the receiving Party.

14.6 The content of this Agreement shall constitute Confidential Information of each Party and shall be treated by both Parties in accordance with the provisions of this Article 14 (Confidentiality).

14.7 Without limiting any confidentiality obligations or other obligations of Vinbiocare under this Agreement, Vinbiocare warrants and covenants that, as of the Effective Date, it and its Affiliates have implemented internal information sharing restrictions ("***Information Firewall***") designed to segregate Arcturus's Manufacturing-related Know-How and Confidential Information and prevent its consultation or use for any other program or purpose other than Vinbiocare's performance of its obligations hereunder. Vinbiocare and its Affiliates shall continue to maintain and be in strict compliance with such Information Firewall in relation to Vinbiocare's Confidential Information until it has been fully deleted or returned to Arcturus by Vinbiocare or its Affiliates. Upon Arcturus's request, Vinbiocare shall provide to Arcturus a written summary of the restrictions that comprise Vinbiocare's Information Firewall as it applies to Arcturus's Confidential Information, and a certification by Vinbiocare, to be made by a senior executive of Vinbiocare, that Vinbiocare and its Affiliates are in full compliance with the Information Firewall.

14.8 Press Releases. [* * *].

14.9 Filing of this Agreement. Arcturus may file this Agreement as required (in Arcturus's reasonable determination) by Applicable Laws, including the requirements of any securities authority or stock exchange on which securities issued by Arcturus or its Affiliates are traded, and Arcturus will use reasonable efforts to seek and obtain confidential treatment consistent with industry standards and in compliance with Applicable Laws, including disclosure requirements of the U.S. Securities and Exchange Commission, or with the requirements of any stock exchange on which securities issued by Arcturus or its Affiliates are traded. Vinbiocare may file this Agreement with the Vietnamese Ministry of Science and Technology as required by Applicable Laws, and Vinbiocare will use reasonable efforts to seek and obtain confidential treatment consistent with industry standards and in compliance with Applicable Laws. Notwithstanding any of the foregoing, each Party shall redact the content of the Services Plan in its entirety from any filing of this Agreement unless otherwise approved in written by the other Party.

14.10 Further Protections. Vinbiocare agrees that the Facility shall not be used to manufacture any products other than the Vaccine in any manner that could conflict with Applicable Laws or maintenance of cGMP status or compromise any Intellectual Property (including the confidentiality of any confidential Know-How) of Arcturus.

## TERM AND TERMINATION

15.1 Term. Unless earlier terminated, this Agreement will take effect on the Effective Date and shall expire on [* * *] (the "***Term***") unless terminated earlier as set forth in this Article 15 (Term and Termination) or per [* * *], or extended by the agreement of the Parties from time to time.

15.2 Termination by Arcturus. Arcturus shall have the right to terminate this Agreement by written notice to Vinbiocare (i) in accordance with Section 13.4 (Additional Compliance Duties), with termination effective thirty (30) days after the date of notice of termination therefor, (ii) if Vinbiocare does not, on or prior to December 31, 2023, make a commercial sale of the Vaccine in the Territory following Regulatory Approval, with such termination effective [* * *] days after the date of notice of termination therefor by Arcturus, (iii) if the Framework Drug Substance Supply Agreement terminates, with termination effective immediately on the date of notice of termination therefor, (iv) if Arcturus determines to globally cease Manufacture, Development and/or Commercialization of the Vaccine due to safety or efficacy concerns, [* * *], with termination effective [* * *] days after the date of notice of termination therefor, (v) [* * *], or (vi) if the Effective Date does not occur within [* * *] Business Days of the Signature Date and provided that Arcturus has provided all necessary documents as reasonably requested by Vinbiocare, with termination effective immediately on the date of notice therefor.

15.3 Termination by Vinbiocare. Vinbiocare shall have the right to terminate this Agreement if the Manufacture, Development and/or Commercialization of the Finished Product in the Territory would be commercially unfeasible, following reasonable discussion via the Steering Committee and written notice to Arcturus.

15.4 Termination for Convenience by Vinbiocare. Vinbiocare shall have the right to terminate this Agreement, with or without cause, upon one hundred eighty (180) days' prior written notice to Arcturus.

15.5 Uncured Material Breach. If either Party (the "***Non-Breaching Party***") believes that the other Party (the "***Breaching Party***") is in material breach of any of its obligations under this Agreement or under the Pharmacovigilance Agreement, then the Non-Breaching Party may deliver written notice of such material breach to the Breaching Party specifying the nature of the breach (a "***Default Notice***"). The Breaching Party shall have ninety (90) days (or thirty (30) days in the event of a payment breach) from the receipt of the Default Notice to cure such breach. If the Breaching Party fails to cure such breach within such ninety (90)-day period (or thirty (30) day period in the event of a payment breach by Vinbiocare), then the Non-Breaching Party may terminate this Agreement by giving the Breaching Party written notice of termination, which termination shall be effective immediately upon the Breaching Party's receipt of such notice of termination.

15.6 Financial Soundness**.** Either Party shall have the right to terminate this Agreement immediately upon written notice to the other Party, if such other Party (a) files a petition under any bankruptcy act or has any such petition filed against it that is not discharged within sixty (60) days of the filing thereof, (b) makes an assignment for the benefit of creditors, (c) appoints or suffers appointment of a receiver or trustee over substantially all of its property that is not discharged within ninety (90) days after such filing, or (d) undertakes an analogous act or undergoes an analogous event under the laws of any jurisdiction to which it is subject.

15.7 Consequences of Termination.

(a) Remedies for breach, rights to accrued payments and the following Articles and Sections shall survive the termination or expiration of this Agreement: 1 (Definitions), 2.3 (Restrictions), 2.4(b), 5 (Financial Terms), 6.5 (Monitoring), 6.9 (Medical Affairs Activities, to the extent applicable), 6.10 (Compliance Matters), 7 (Safety and Pharmacovigilance, to the extent applicable), 8 (Intellectual Property), 9 (Warranties), 10 (Limitations/Exclusions of Liability), 11 (Indemnification), 12 (Insurance, for a period of six years following termination), 14 (Confidentiality), 15.7 Consequences of Termination), and 17 (Miscellaneous).

(b) In the event of termination or expiration of this Agreement, Vinbiocare shall destroy or return all Confidential Information of Arcturus, as directed by Arcturus, including any deliverables provided as a part of Services (except to the extent required to retain for purposes of complying with Applicable Laws). Notwithstanding the foregoing, Vinbiocare shall have the right to retain and use facility-related documentation that are not specifically related to Bulk Drug Substance, Bulk Drug Product, Finished Product or the Process.

(c) In the event of termination or expiration of this Agreement, Vinbiocare shall, at the instruction of Arcturus, (i) transfer all rights as Local MAH, if any, to Arcturus (or its designee) and shall cooperate in good faith with Arcturus for the orderly transition of any authorizations with respect to the Vaccine in the Territory and (ii) transfer all of Vinbiocare's ownership rights (if any), and underlying goodwill, to any trademark used for the Finished Product in the Territory.

(d) In the event of termination or expiration of this Agreement, Vinbiocare shall cease all Manufacturing and Commercialization activities of the Vaccine, and shall not use (directly or indirectly) or enable any third party to use any Licensed Technology, except that, in the event of a termination by Vinbiocare pursuant to Section 15.5 (Uncured Material Breach) following Regulatory Approval, Vinbiocare may continue permitted Manufacturing and Commercialization activities for a period of [* * *] months following the date of termination so long as Vinbiocare timely makes all payments due to Arcturus under this Agreement related to such activities and complies with the terms and conditions of this Agreement (including Sections 2.2 (Commercialization by Vinbiocare) and 2.3 (Restrictions).

(e) Within thirty (30) days of any request from Arcturus from time to time, Vinbiocare shall provide to Arcturus a written certification that it has complied with all of the obligations under this Section 15.7.

(f) In the event of termination of this Agreement by Arcturus pursuant to clause (iv) of Section 15.2 (Termination by Arcturus) for [* * *].

(g) In the event of termination of this Agreement by Vinbiocare pursuant to Section 15.4 (Uncured Material Breach) due to material breach by Arcturus, Arcturus must continue to make supplies under, and Vinbiocare must pay for, the Drug Substance subject to purchase orders agreed in writing by the Parties prior to the date of termination of this Agreement.

## FORCE MAJEURE

In the event that either Party is prevented from performing its obligations under this Agreement as a result of any contingency beyond its reasonable control ("***Force Majeure***"), including any actions of Governmental Authorities or agencies, war, terrorism, hostilities between nations, civil commotions, riots, strikes, lockouts, sabotage, shortages in supplies (but only to the extent such shortages are not caused by the nonperforming Party), pandemics (such as the events connected with the 2019 novel coronavirus disease (COVID-19)), epidemics, or quarantines, energy shortages, fire, floods and acts of nature such as typhoons, hurricanes, earthquakes, or tsunamis, the Party so affected shall not be responsible to the other Party for any delay or failure of performance of its obligations hereunder, for so long as Force Majeure prevents such performance. In the event of Force Majeure, the Party immediately affected thereby shall give prompt written notice to the other Party specifying the Force Majeure event complained of, and shall use reasonable efforts to resume performance of its obligations.

## MISCELLANEOUS

17.1 Contract Construction. In construing this Agreement, unless expressly specified otherwise: (a) references to this Agreement include all exhibits, addenda and schedules hereto, if any; (b) references to Articles and Sections are to sections of, and exhibits to, this Agreement and references to an Article or Section shall include all subsections subordinate to such Article or Section (e.g., "Section 2.1" would include Sections 2.1, 2.1.x and 2.1.x.y); (c) except where the context otherwise requires, use of either gender includes the other gender, and use of the singular includes the plural and vice versa; (d) any phrase, list or examples following the word "including" shall be interpreted without limitation to the generality of the preceding words; (e) words such as "herein", "hereof", and "hereunder" refer to this Agreement as a whole and not merely to the particular provision in which such words appear, (f) except where the context otherwise requires, the word "or" is used in the inclusive sense (i.e., "and/or"); (g) all references to "dollars" or "$" herein shall mean U.S. Dollars; and (h) all references to "days" means calendar days unless otherwise identified as "Business Days".

17.2 Notice. Any notice required by this Agreement shall be in writing and shall be delivered as follows with notice deemed given as indicated: (a) by personal delivery when delivered personally; (b) by overnight or international courier service upon written verification of receipt; (c) by certified or registered mail, return receipt requested, upon verification of receipt; or (d) by electronic mail, upon successful transmission. Notice shall be sent to the addresses set forth below, as may be updated in writing from time to time by the applicable Party.

(a) If to Arcturus:

Arcturus Therapeutics, Inc.
10628 Science Center Drive, Suite 250
San Diego, CA 92121 USA
Attn: [* * *]
Email: [* * *]

with a copy (which shall not constitute notice) to:

Arcturus Therapeutics, Inc.
10628 Science Center Drive,
Suite 250

San Diego, California 92121 USA
Attention: [* * *]
Email: [* * *]

(b) If to Vinbiocare:

Vinbiocare Biotechnology Joint Stock Company
[* * *]
Attention: [* * *]
Email: [* * *]

17.3 Subcontracting. Arcturus may subcontract all or any part of its obligations under this Agreement to any third party selected by Arcturus. Arcturus shall remain responsible for all activities assigned to each such subcontractor.

17.4 Assignment and Delegation. Neither this Agreement, nor any rights or interest hereunder shall be assignable or delegable by either Party without prior written consent of the other Party, such consent not to be unreasonably withheld, except that [* * *]. This Agreement shall be binding upon the successors and permitted assigns and delegees of the Parties and the name of a Party appearing herein shall be deemed to include the name of such Party's successors and permitted assigns to the extent necessary to carry out the intent of this Agreement. Any assignment that does not comply with this Section 17.4 shall be void.

17.5 Further Actions. Each Party agrees to execute, acknowledge and deliver such further instruments, and to do all such other acts, as may be necessary or appropriate in order to carry out the purposes and intent of this Agreement.

17.6 Waiver. No provision of this Agreement shall be waived by any act, omission or knowledge of any Party or its agents or employees except by an instrument in writing expressly waiving such provision and signed by a duly authorized officer of the waiving Party.

17.7 Descriptive Headings. The descriptive headings of this Agreement are for convenience only, and shall be of no force or effect in construing or interpreting any of the provisions of this Agreement.

17.8 Governing Law and Venue.

(a) This Agreement shall be governed by and construed in accordance with the laws of [* * *] without applying any principles of conflicts of laws that would result in the application of a different body of law.

(b) The United Nations Convention on Contracts for the International Sale of Goods is hereby excluded by the Parties and shall not apply to this Agreement.

(c) Any dispute, controversy, or claim arising out of or in relation to this Agreement, or the existence, breach, termination or invalidity thereof shall be settled, insofar as it is possible, by mutual consultation and consent. If the Parties are unable to resolve such dispute within thirty (30) days commencing discussions to resolve the dispute by mutual consultation and consent, the dispute shall be finally resolved by arbitration in Singapore in accordance with the Arbitration Rules of the Singapore International Arbitration Centre ("***SIAC Rules***") for the time being in force, conducted in the English language, which rules are deemed to be incorporated by reference in this clause. All disputes shall be heard by a single arbitrator,

unless the claim amount exceeds USD $1,000,000 in which case the dispute shall be heard by a panel of three (3) arbitrators. In any action or proceeding to enforce rights under this Agreement, the prevailing party will be entitled to recover costs and attorneys' fees.

17.9 Severability. Whenever possible, each provision of this Agreement will be interpreted in such manner as to be effective and valid under Applicable Laws, but if any provision of this Agreement is held to be prohibited by or invalid under Applicable Laws, such provision will be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of this Agreement.

17.10 Independent Contractors. This relationship between Parties created by this Agreement is one of independent contractors and neither Party shall have the power or authority to bind or obligate the other except as expressly set forth in this Agreement.

17.11 Entire Agreement Amendments. This Agreement, the Pharmacovigilance Agreement and the Framework Drug Substance Supply Agreement constitute the entire understanding and agreement between the Parties with respect to the subject matter of this Agreement and supersede any and all prior agreements, understandings and arrangements, whether oral or written, between the Parties relating to the subject matter of this Agreement. For avoidance of doubt, this Agreement does not supersede any confidentiality agreement previously entered into by the Parties, which shall exist in accordance with their terms. No term of this Agreement may be amended except upon written agreement of both Parties, unless otherwise expressly provided in this Agreement.

17.12 English Language. This Agreement is written in the English language, which shall be controlling for all purposes. No translation of this Agreement into any other language shall be of any force or effect in the interpretation of this Agreement or in a determination of the intent of the Parties hereto. Except as otherwise expressly set forth, with respect to any written materials to be presented to Arcturus for review or approval, Vinbiocare shall provide accurate English copies.

17.13 Rights of Third Parties. Nothing in this Agreement is intended to confer on any person any right to enforce any term of this Agreement which that person would not have had but for the Contracts (Rights of Third Parties) Act 1999 ("***Third Party Rights Ac***t"). Any right or remedy of a third party that existed or is available apart from the Third Party Rights Act is not affected.

17.14 Counterparts. This Agreement may be executed in counterparts, each of which will be considered an original, but all of which together will constitute the same instrument. Once signed, any reproduction of this Agreement made by reliable means (e.g., photocopy, portable document format (PDF) or facsimile) is considered an original.

[Signature Page to Follow]

To evidence their agreement to be bound by this Agreement, Vinbiocare and Arcturus have executed and delivered this Agreement as of the Signature Date.

| ARCTURUS THERAPEUTICS, INC. | | VINBIOCARE BIOTECHNOLOGY JOINT STOCK COMPANY | |
|---|---|---|---|
| By: | _____ | By: | _____ |
| Name: | Joseph Payne | Name: | _____ |
| Its: | President and CEO | Its: | _____ |

**APPENDIX 1**

**CERTAIN LICENSED PATENTS**

[* * *]

**APPENDIX 2**

**SERVICES PLAN**

[* * *]

**EXHIBIT 10.33**

**CERTAIN INFORMATION IDENTIFIED BY BRACKETED ASTERISKS ([* * *]) HAS BEEN OMITTED FROM THIS EXHIBIT BECAUSE IT IS BOTH NOT MATERIAL AND WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.**

# FRAMEWORK DRUG SUBSTANCE SUPPLY AGREEMENT

This FRAMEWORK DRUG SUBSTANCE SUPPLY AGREEMENT (this "***Agreement***"), dated as of the 29th day of July, 2021 (the "***Signature Date***"), is being entered into by and between Arcturus Therapeutics, Inc., a Delaware corporation ("***Arcturus***") with its headquarters at 10628 Science Center Drive, Suite 250 San Diego, CA 92121, and Vinbiocare Biotechnology Joint Stock Company a company duly established under the laws of Vietnam ("***Vinbiocare***"), with its registered address at Techno Park office building, Vinhomes Ocean Park urban area, Da Ton commune, Gia Lam district, Hanoi, Vietnam. Arcturus and Vinbiocare may be referred to herein by name or individually, as a "***Party***" and collectively, as the "***Parties***."

## BACKGROUND

**WHEREAS**, Arcturus is a messenger RNA medicines company focused on the discovery, development and commercialization of therapeutics for rare diseases and of vaccines;

**WHEREAS**, contemporaneously with the signature of this Agreement the Parties are entering into a technology license and technical support agreement ("***License Agreement***"), whereby, among other things, Arcturus will grant a license of certain manufacturing technology to Vinbiocare for the production of doses of Vaccine using Bulk Drug Substance supplied by Arcturus under this Agreement; and

**WHEREAS**, the Parties desire to set forth the terms pursuant to which Arcturus will supply Bulk Drug Substance to Vinbiocare for the purpose of manufacturing Vaccines at the Facility.

**NOW, THEREFORE**, in consideration of the covenants, conditions and undertakings hereinafter set forth, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby agree as follows.

## Article 1
## DEFINITIONS

The following terms shall have the following meanings when used in this Agreement:

1.1 "***Affiliate***" means, with respect to either Party, any business entity controlling, controlled by, or under common control with such Party. For the purpose of this definition only, "control" means (a) the possession, directly or indirectly, of the power to direct the management or policies of a business entity, whether through the ownership of voting securities, by contract or otherwise, or (b) the ownership, directly or indirectly, of at least fifty percent (50%) of the voting securities or other ownership interest of a business entity.

1.2 "***Agreement***" has the meaning set forth in the Preamble.

1.3 "***Anti-Corruption Laws***" has the meaning set forth in Section 5.1(b).

1.4 "***Applicable Laws***" means all laws, statutes, rules, regulations, guidelines, orders, judgments and/or ordinances of any Regulatory Authority which apply to the Parties activities, rights and obligations hereunder.

1.5 "***Arcturus Indemnitees***" has the meaning set forth in Section 7.2.

1.6 "***Bulk Drug Product***" means cGMP-conforming lipid nanoparticle pharmaceutical product formulated with the Bulk Drug Substance, but that has not been filled or finished.

1.7 "***Bulk Drug Substance***" means cGMP-conforming drug substance consisting of the messenger RNA (mRNA) compound of the Vaccine in bulk to be used for Manufacture of Bulk Drug Product and Finished Product.

1.8 "***Business Day***" means any day other than a Saturday or Sunday or a day on which banks are required or authorized to be closed in (with respect to obligations of Arcturus) California, USA, or (with respect to obligations of Vinbiocare) in Hanoi, Vietnam.

1.9 "***cGMP***" means current Good Manufacturing Practices promulgated by the FDA, including within the meaning of 21 C.F.R. Parts 210 and 211, as amended.

1.10 "***Confidential Information***" means all information of any nature (whether oral, written, electronic or in any other form) including data, know-how, trade secrets, manufacturing processes and systems, samples of goods, software techniques, procedures, test methods, unpublished financial statements and information, licenses, prices, price lists, pricing policies, customer and supplier names and other information relating to customers and suppliers, marketing techniques and marketing development tactics and plans, and all other information containing or consisting of material of a technical, operational, administrative, economic, marketing, planning, business or financial nature or in the nature of Intellectual Property, in each case, disclosed by Arcturus or its Affiliates (or its or their Representatives) to Vinbiocare or its Affiliates (or its or their Representatives), or disclosed by Vinbiocare or its Affiliates (or its or their Representatives) to Arcturus or its Affiliates (or its or their Representatives). The terms of this Agreement shall be deemed to be the Confidential Information of each Party. For avoidance of doubt, (i) all Intellectual Property controlled by Arcturus or its Affiliates, and (ii) any information disclosed by a vendor to Vinbiocare that relates to the business or technologies of Arcturus, including to the Vaccine or proprietary lipids of Arcturus, shall be deemed Confidential Information of Arcturus.

1.11 "***Customer***" means any Person that purchases Finished Product from Vinbiocare.

1.12 "***Drug Substance Dose***" means the amount of Bulk Drug Substance in a single dose of the Vaccine.

1.13 "***Effective Date***" means the effective date of the License Agreement.

1.14 "***Facility***" means the facility located at [* * *], or such other location as the Parties mutually agree in writing.

1.15 "***FCPA***" means the U.S. Foreign Corrupt Practices Act of 1977, as amended.

1.16 "***Finished Product***" means the Bulk Drug Product Manufactured into doses of the Vaccine by Vinbiocare at the Facility, which has completed fill and finish (lyophilization) activities.

1.17 "***IND***" means an Investigational New Drug application in the U.S. filed with the FDA or a corresponding application filed with the Regulatory Authority of a given country or group of countries.

1.18 "***Indemnify***" has the meaning set forth in Section 7.1.

1.19 "***Intellectual Property***" means each of the following: (a) copyrights, trade secrets, patent rights, supplementary patent certificates, patent extensions, know-how, concepts, database rights, and rights in trademarks and designs (whether registered or unregistered), (b) applications for registration, and the right to apply for registration, for any of the same, (c) all other intellectual property rights and equivalent or similar forms of protection existing anywhere in the world, (d) inventions, developments, methods or processes, including any intellectual property rights in the foregoing and (e) modifications or improvements to any of the items in clauses (a)-(d).

1.20 "***Liabilities***" has the meaning set forth in Section 7.1.

1.21 "***License Agreement***" has the meaning set forth in the Recitals.

1.22 "***Manufacture***" means any of the processes and procedures for the manufacture of the doses of the Vaccine as the context admits, including (a) the manufacture of the Bulk Drug Substance, (b) manufacture and formulation of the Bulk Drug Product, (c) fill, lyophilization and finish (inspection, labeling, packaging) of the Bulk Drug Product into Finished Product, (d) the quality control of the doses of the Vaccine during the activities of (a)-(c), and (e) the storage of the doses of the Vaccine as appropriate between stages of manufacture or distribution to customers.

1.23 "***Party***" or "***Parties***" has the meaning set forth in the Preamble.

1.24 "***Person***" means an individual, a corporation, a partnership, an association, a trust or other entity or organization, including a government or political subdivision or an agency thereof.

1.25 "***Place of Shipment***" has the meaning set forth in Section 3.2.

1.26 "***Purchase Order***" has the meaning set forth in Section 2.4.

1.27 "***Regulatory Approval***" means, with respect to the Vaccine, the approvals and authorizations issued by the Regulatory Authority that are necessary for the importation and use of the Vaccine in the Territory for emergency, conditional or permanent use.

1.28 "***Regulatory Authority***" means any international, federal, state or local governmental or regulatory body, agency, department, bureau, court or other entities (such as the United States Food and Drug Administration ("***FDA***"), the European Medicines Agency and the Drug Administration of Vietnam) responsible for (a) the regulation (including pricing) of any aspect of pharmaceutical or medicinal products intended for human use or (b) health, safety or environmental matters generally.

1.29 "***Representative***" means a Party's employees, agents and other representatives (including contractors, consultants and advisors).

1.30 "***Taxes***" means all taxes and duties that are assessed by any national, federal, state, local or non-U.S. governmental authority, including, without limitation, sales, use, excise, value-added and withholding taxes.

1.31 "***Term***" has the meaning set forth in Section 10.1.

1.32 "***Territory***" means Vietnam.

1.33 "***Third Party Claim***" has the meaning set forth in Section 7.1.

1.34 "***Vaccine***" means the vaccine candidate or vaccine product, known as ARCT-021 and ARCT-154, intended to protect against the SARS-CoV-2 coronavirus; provided, however, that Vaccine shall include the Variant Vaccine (as defined in the License Agreement) if such Variant Vaccine becomes a Vaccine in accordance with the License Agreement.

1.35 "***Vinbiocare***" has the meaning set forth in the Preamble.

1.36 "***Vinbiocare Indemnitees***" has the meaning set forth in Section 7.1.

## Article 2
## PURCHASE AND SUPPLY OF VACCINE DOSES

2.1 Supply Scope. Arcturus will supply Bulk Drug Substance to Vinbiocare in accordance with the terms and procedures set forth in this Agreement.

2.2 Restrictions. Vinbiocare may use the Bulk Drug Substance only (i) for the purpose of Manufacturing Finished Product at the Facility solely for sales of Finished Product for use in the Territory following Regulatory Approval in the Territory and (ii) within the scope of the license grant, and subject to the restrictions thereon, set forth in the License Agreement. Vinbiocare shall not permit sales, resales or use of the Bulk Drug Product or Finished Product outside of the Territory.

2.3 Additional Terms: The Parties will negotiate in good faith and agree upon forecasting procedures, ordering procedures, inventory requirements and other terms as to be set forth in Exhibit A (Additional Terms). The Parties agree that details of Additional Terms shall be consistent with the following principles:

(a) Forecasting: Arcturus shall not unreasonably refuse purchase orders submitted by Vinbiocare.

(b) Order: Upon Arcturus's acceptance of any purchase order, such purchase order shall be binding.

(c) Inventory Requirements. Arcturus shall maintain reasonable levels of inventory to supply Bulk Drug Substance in accordance with binding purchase orders.

## Article 3
## DELIVERY

3.1 Cooperation on Delivery Dates. Arcturus will keep Vinbiocare updated on a monthly basis (and as reasonably requested by Vinbiocare from time to time) regarding the expected delivery dates for Bulk Drug Substance. For avoidance of doubt, the Bulk Drug Substance might be delivered in more than one shipment on different dates.

3.2 Delivery. The Drug Substance Doses will be delivered by, or on behalf of, Arcturus, [* * *]. With respect to any amounts paid by Arcturus that are the responsibility of Vinbiocare under this Section 3.2, Vinbiocare shall reimburse such amounts to Arcturus within [* * *] days of invoice therefor. Promptly upon receipt, Vinbiocare shall inspect and review all applicable documentation and packaging. Risk of loss of or damage to the Drug Substance Doses shall pass to Vinbiocare upon loading with the carrier at the Place of Shipment.

3.3 Shipping. The Parties will negotiate in good faith and agree upon shipping requirements to be set forth in Exhibit A (Additional Terms).

3.4 Packaging. The Parties will negotiate in good faith and agree upon packaging requirements to be set forth in Exhibit A (Additional Terms).

3.5 Quality. The Drug Substance Doses shall meet quality standards, which are to be determined in accordance with the provisions in Section 6.5. Arcturus shall supply the Bulk Drug Substance in accordance with such to be determined quality standards. Vinbiocare may reject each shipment of Bulk Drug Substance if such shipment does not comply with the to be determined quality standards.

3.6 Inspection; Acceptance; Right of Rejection. The Parties will negotiate in good faith and agree upon procedures, rights and obligations in connection with inspection, acceptance and right of rejection of Bulk Drug Substance to be set forth in Exhibit A (Additional Terms).

3.7 Title. Title to the Drug Substance Doses shall transfer to Vinbiocare upon [* * *]. Vinbiocare shall be solely responsible for import clearance with respect to the Drug Substance Doses and for keeping all records, documents, correspondence and tracking information required by all Applicable Laws arising out of or in connection with the importation or delivery.

## Article 4
## PAYMENTS

4.1 Price.

(a) The price for each Drug Substance Dose shall be calculated as follows: [* * *].

[* * *]

(b) The price for each Drug Substance Dose shall be payable in two installments as described in Section 4.2(a) below [* * *].

(c) On an annual basis, beginning with calendar year 2024 (i.e., the first price increase may not take place before January 1, 2024), Arcturus may, by notice to Vinbiocare, adjust the Price based on the average percentage increase in the PPI over the preceding year, with any increased prices and applicable to any Purchase Order accepted by both Parties on or after the date of such notice. For purposes of this Agreement, PPI means the Producer Price Index for Pharmaceutical Preparation Manufacturing as published by the United States Department of Labor, Bureau of Labor Statistics (or its successor equivalent index) in the United States, or, if such index ceases then another Producer Price Index agreed in good faith by the Parties. [* * *].

4.2 Payment Timing. With respect to each Purchase Order, Vinbiocare shall pay to Arcturus (i) an upfront fee equal to [* * *] of prevailing price within [* * *] days from the acceptance date of Purchase Order and (ii) the remaining [* * *] of prevailing price within [* * *] days of the receipt of the invoice therefor ([* * *]) and the Certificate of Analysis and Certificate of Compliance.

4.3 Payment in United States Dollars. All payments to Arcturus under this Agreement shall be made by electronic funds transfer in United States dollars in immediately available funds to such bank account as Arcturus may from time to time designate by notice to Vinbiocare.

4.4 Taxes.

(a) Unless otherwise agreed in writing by the Parties, the price for Bulk Drug Substance payable in connection with this Agreement excludes all Taxes (including withholding Tax),

customs, duties and governmental assessments, which shall be the responsibility of Vinbiocare; provided, however, that Arcturus shall be responsible for Taxes and export duties, if any, assessed by the United States government, including Taxes based on net income of Arcturus imposed in the United States.

(b) [* * *]. If any deduction or withholding Tax in Vietnam (or any other taxing jurisdiction other than the United States) in respect of any Taxes is required by law to be made from the amounts payable under this Agreement, Vinbiocare shall be obliged to pay to Arcturus (by the same applicable due date) such greater sum as will leave Arcturus, after such required deduction or withholding is made, with the same amount as it would have been entitled to receive in the absence of any such required deduction or withholding obligation.

(c) [* * *].

4.5 Set-Off. Vinbiocare shall in no case be entitled to set off or otherwise withhold or adjust any payment due to Arcturus under this Agreement in view of claims, whether justified or unjustified, that Vinbiocare may have against Arcturus for any reason.

4.6 Late Payment. In the event that any payment is not received by Arcturus on or before the applicable due date, then Arcturus may, in addition to any other remedies available at equity or in law or set forth in this Agreement, at its option, charge interest on the outstanding sum from the due date at [* * *] per month (including any partial month) until paid in full (or, if less, the maximum amount permitted by Applicable Law).

4.7 Maintenance of Books/Records. Vinbiocare shall maintain and shall (with respect to its Affiliates, subcontractors and sublicensees) ensure the maintenance of accurate and up to date records and books of account during the terms of this Agreement and for the later of [* * *] years following termination.

## Article 5
## COMPLIANCE DUTIES

5.1 Compliance Duties.

(a) Each Party shall take all steps, including implementing and maintaining (at a minimum) a robust internal compliance program, so as to ensure that its business, practice and the sales activities that it performs under this Agreement are carried out in accordance with all Applicable Laws.

(b) Vinbiocare will have sole responsibility for conducting manufacturer's release of Bulk Drug Product and Finished Product, and shall conduct all such activities in compliance with all Applicable Laws. Without limiting the foregoing, any release of Finished Product shall include a certificate of analysis.

(c) Vinbiocare shall generally conduct its business and activities in a responsible and ethical manner. Without limiting the foregoing, Vinbiocare shall conduct its activities in a manner that is consistent with all Applicable Laws, including Applicable Laws for the prevention of fraud, kickbacks, bribery, corruption, racketeering, money laundering or terrorism, including the FCPA, each, as amended from time to time ("***Anti-Corruption Laws***"). Vinbiocare further undertakes that none of its employees, directors or officers shall, directly or indirectly, engage in any activities that violate any Anti-Corruption Laws (i) in order to influence official action of any government official, or (ii) with the intention of or as a condition to induce any Person to carry out a duty or function improperly or to reach a favorable decision on an improper basis, in each case in connection with the activities contemplated under this Agreement.

(d) Vinbiocare shall promptly provide Arcturus with written notice of (a) becoming aware of any violation of this Section 5.1 and of any Anti-Corruption Laws (whether related to the distribution, marketing or sale of the Vaccine or otherwise), and (b) upon receiving a formal notification that it or any of its employees, agents, directors or officers is the target of a formal investigation by any governmental authority for a violation of any Anti-Corruption Laws (whether related to the activities under this Agreement or otherwise). In the event of any such notice, Arcturus may, at its sole discretion, immediately terminate this Agreement and such termination shall be deemed to be a termination of this Agreement for material breach by Vinbiocare.

## Article 6
## **WARRANTIES**

6.1 Vinbiocare Warranties. Vinbiocare warrants to Arcturus as follows:

(a) Vinbiocare has all requisite power and authority to enter into this Agreement. The person signing this Agreement has the necessary authority to legally bind Vinbiocare to the terms set forth herein.

(b) Vinbiocare's execution of this Agreement and performance of the terms set forth herein will not cause Vinbiocare to be in conflict with or constitute a breach of its constitutional documents nor any other agreement, court order, consent decree or other arrangement, whether written or oral, by which it is bound.

(c) This Agreement is its legal, valid and binding obligation, enforceable against Vinbiocare in accordance with the terms and conditions hereof.

6.2 Arcturus Warranties. Arcturus warrants to Vinbiocare as follows:

(a) Arcturus is a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware.

(b) Arcturus has all requisite power and authority to enter into this Agreement. The person signing this Agreement has the necessary authority to legally bind Arcturus to the terms set forth herein.

(c) Arcturus's execution of this Agreement and performance of the terms set forth herein will not cause Arcturus to be in conflict with or constitute a breach of its organizational documents nor any other agreement, court order, consent decree or other arrangement, whether written or oral, by which it is bound.

(d) This Agreement is its legal, valid and binding obligation, enforceable against Arcturus in accordance with the terms and conditions hereof.

(e) Arcturus has and will have good title to the Drug Substance Doses supplied under this Agreement free from Liens, charges and encumbrances and has and will have the right to supply the same.

6.3 Warranty. Arcturus warrants that the Drug Substance Doses supplied by Arcturus under this Agreement (other than developmental quantities, if any, not required to be produced in accordance with cGMP) shall, upon tender of delivery, conform to and shall have been processed and, if applicable, packaged, in conformance with cGMP, and in accordance with all Applicable Laws. The Drug Substance

Doses shall not be adulterated or misbranded by Arcturus and shall meet in all material respects all requirements set out in Sections 3.3,3.4 and 3.5 above. [* * *].

6.4 Development Stage Acknowledgement. Vinbiocare understands that the Vaccine is a clinical-stage candidate and that [* * *]. Vinbiocare understands and agrees that Arcturus shall have the freedom to exercise its judgment in the development and conduct of its clinical development strategies.

6.5 Stability and Handling Acknowledgement. Vinbiocare understands that, as of the Effective Date, the stability and expiration date for Drug Substance Doses is being determined. With respect to each Purchase Order, Arcturus will provide the then-current stability/expiration date parameters and Vinbiocare shall be responsible for meeting all storage, use-by date and handling conditions in accordance with instructions provided by Arcturus. [* * *].

6.6 Disclaimer. EACH PARTY AGREES AND ACKNOWLEDGES THAT, EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, NEITHER PARTY MAKES ANY REPRESENTATIONS OR WARRANTIES OF ANY KIND WHATSOEVER, IMPLIED OR STATUTORY, AND EACH PARTY HEREBY EXPRESSLY DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES, IMPLIED OR STATUTORY, [* * *].

## Article 7
## INDEMNIFICATION

7.1 Indemnification by Arcturus. Arcturus hereby agrees, at its sole cost and expense, to defend, hold harmless and indemnify, to the extent permitted by Applicable Law, (collectively, "***Indemnify***") Vinbiocare and its Affiliates and their respective agents, directors, officers and employees of such Persons and the respective successors and assigns of any of the foregoing (the "***Vinbiocare Indemnitees***") from and against any and all liabilities, damages, penalties, fines, costs and expenses, including, reasonable attorneys' fees (collectively, "***Liabilities***") resulting from suits, claims, actions and demands, in each case brought by an unaffiliated third party (each, a "***Third Party Claim***") against any Vinbiocare Indemnitee and arising from or occurring as a result of: [* * *].

7.2 Indemnification by Vinbiocare. Vinbiocare hereby agrees, at its sole cost and expense, to Indemnify Arcturus and its Affiliates and their respective agents, directors, officers and employees of such Persons and the respective successors and assigns of any of the foregoing (the "***Arcturus Indemnitees***") from and against any and all Liabilities resulting from a Third Party Claim against any Arcturus Indemnitee and arising from or occurring as a result of: [* * *].

7.3 Procedure. To be eligible to be indemnified hereunder, the indemnified Person (or the indemnified Party on behalf of such indemnified Person) shall provide the indemnifying Party with prompt written notice of the Third Party Claim giving rise to the indemnification obligation pursuant to Section 7.1 or Section 7.2, as applicable, and the right to control the defense (with the reasonable cooperation of the indemnified Person) or settlement any such claim; provided, however, that the indemnified Person's failure to provide such notice shall not relieve the indemnifying Party of any obligation or liability hereunder except to the extent that the indemnifying Party has suffered actual prejudice thereby; provided, further, that the indemnifying Party shall not enter into any settlement that admits fault, wrongdoing or damages without the indemnified Person's written consent, such consent not to be unreasonably withheld or delayed. The indemnified Person shall have the right to join, but not to control, at its own expense and with counsel of its choice, the defense of any claim or suit that has been assumed by the indemnifying Party.

7.4 LIMITATION OF LIABILITY. TO THE MAXIMUM EXTENT PERMITTED BY LAW, (A) EXCEPT WITH RESPECT TO [* * *], NEITHER PARTY SHALL BE LIABLE TO THE OTHER

PARTY FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL OR PUNITIVE DAMAGES, WHETHER LIABILITY IS ASSERTED IN CONTRACT, TORT [* * *], OR ANY OTHER THEORY OR FORM OF ACTION, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY THEREOF; AND (B) ARCTURUS'S TOTAL LIABILITY IN CONNECTION WITH ANY CLAIM OR SERIES OF CONNECTED CLAIMS ARISING IN CONNECTION WITH THIS AGREEMENT SHALL IN NO EVENT EXCEED [* * *].

## Article 8
## CONFIDENTIALITY AND PUBLICITY

8.1 Obligations of Confidentiality. From the Effective Date and for a period of ten (10) years, or in perpetuity with respect to trade secrets, after this Agreement terminates, each Party and its Affiliates shall:

(a) keep the Confidential Information of the other Party or its Affiliates strictly confidential;

(b) not disclose the Confidential Information of the disclosing Party to any other person or entity other than with the prior written consent of the disclosing Party; and

(c) not use the Confidential Information of the disclosing Party for any purpose other than the performance of its obligations under this Agreement.

8.2 Representatives. During the Term of this Agreement the receiving Party may disclose the Confidential Information of the disclosing Party to its Affiliates and Representatives to the extent that it is necessary for the purposes of this Agreement. The Party disclosing the information to its Representatives shall ensure that each Representative is made aware of and complies with the receiving Party's obligations of confidentiality under this Agreement. Each receiving Party shall be responsible for any breach of this Article 8 by its Representatives.

8.3 Permitted Disclosures.

(a) The obligations imposed by this Article 8 upon the receiving Party shall not apply to any Confidential Information of the disclosing Party which:

(i) is or hereafter becomes part of the public domain through no act or omission of the receiving Party, its employees, Affiliates, sublicensees and/or subcontractors; or

(ii) was in the lawful possession of the receiving Party prior to receipt of the Confidential Information from the disclosing Party; or

(iii) previously was, or at any time hereafter is, provided to the receiving Party by a third party having the right to do so and which did not originate directly or indirectly from the disclosing Party.

Any combination of features or disclosures will not be deemed to fall within the foregoing exclusions merely because individual features are published or available to the general public or in the rightful possession of the receiving Party unless the combination itself and principle of operation are published or available to the general public or in the rightful possession of the receiving Party.

(b) A receiving Party may disclose Confidential Information of the disclosing Party if it is required to disclose such Confidential Information by Applicable Law or a valid order of a court, provided that (to the extent permitted by Applicable Law) the receiving Party

promptly notifies the disclosing Party of the requirement of such disclosure, takes reasonable and lawful actions to avoid or minimize the degree of such disclosure and to have confidential treatment accorded to any Confidential Information disclosed, and cooperates fully with the disclosing Party in connection with the disclosing Party's efforts to apply for a protective order or take other appropriate action to restrict disclosure of the Confidential Information.

8.4 Press Releases. Vinbiocare shall not, without the prior written consent of Arcturus, publish (or enable or permit the publication by any third party of) any press release, publicity, advertisements or marketing materials, or make any references, statements, announcements or denial or confirmation in any medium concerning the terms of this Agreement or the development, manufacturing, distribution or commercialization of the Vaccine. Vinbiocare shall provide Arcturus with advance review copies of all such documents and proposed verbal communications, accompanied by translations into English if not prepared originally in English, reasonably in advance of the proposed release or communication.

8.5 Filing of this Agreement. Arcturus may file this Agreement as required (in Arcturus's reasonable determination) by Applicable Laws, including the requirements of any securities authority or stock exchange on which securities issued by Arcturus or its Affiliates are traded, and Arcturus will use reasonable efforts to seek and obtain confidential treatment consistent with industry standards and in compliance with Applicable Laws, including disclosure requirements of the U.S. Securities and Exchange Commission, or with the requirements of any stock exchange on which securities issued by Arcturus or its Affiliates are traded. Vinbiocare may file this Agreement with the Vietnamese Ministry of Science and Technology as required by Applicable Laws, and Vinbiocare will use reasonable efforts to seek and obtain confidential treatment consistent with industry standards and in compliance with Applicable Laws.

## Article 9
## INTELLECTUAL PROPERTY

9.1 Arcturus Existing Intellectual Property. As between the Parties, all Intellectual Property rights that are owned or controlled by Arcturus as of the Effective Date shall remain under the ownership or control of Arcturus throughout the Term and thereafter. For clarity, all Intellectual Property related to the Vaccine, the Bulk Drug Substance, the Bulk Drug Product or Finished Product, or the Manufacture, storage or preparation thereof, that exist as of the Effective Date shall be deemed Arcturus's Intellectual Property and Arcturus shall retain and own and have the exclusive right, title and interest in and to all such Intellectual Property.

9.2 New Intellectual Property. All new Intellectual Property that is generated, developed, conceived or reduced to practice in the course of activities related to this Agreement that (a) is related to the [* * *].

## Article 10
## TERM AND TERMINATION

10.1 Term. Unless earlier terminated in accordance with this Article 10, this Agreement will take effect on the Signature Date and will terminate contemporaneously with the License Agreement (the "***Term***").

10.2 Termination.

(a) For Breach. This Agreement may be terminated immediately by either Party upon written notice to the other Party if the other Party materially breaches any of the provisions of this Agreement and such breach is not cured within forty five (45) days after the giving of

written notice (or within fifteen (15) days after receipt of written notice in the case of payment breach) requiring the breach to be remedied; [* * *].

(b) By Arcturus. This Agreement may be terminated by Arcturus upon written notice to Vinbiocare (i) if Arcturus determines to globally cease Manufacturing the Vaccine for any reason relating to the safety or efficacy of the Vaccine or (ii) in accordance with Section 5.1 (Compliance Duties). Arcturus must provide substantiation to any claims regarding its decision to terminate the Agreement for safety or efficacy of the Vaccine and Vinbiocare may challenge such assertion in accordance with the dispute resolution terms outlined in Section 12.8(c).

(c) Financial Soundness. Either Party shall have the right to terminate this Agreement immediately upon written notice to the other Party, if such other Party (a) files a petition under any bankruptcy act or has any such petition filed against it that is not discharged within sixty (60) days of the filing thereof, (b) makes an assignment for the benefit of creditors, (c) appoints or suffers appointment of a receiver or trustee over substantially all of its property that is not discharged within ninety (90) days after such filing, or (d) undertakes an analogous act or undergoes an analogous event under the laws of any jurisdiction to which it is subject.

10.3 Effect of Termination. Expiration or termination of this Agreement shall be without prejudice to any rights or obligations that accrued to the benefit of either Party prior to such expiration or termination. In the event of a termination of this Agreement, Vinbiocare shall promptly pay Arcturus all unpaid amounts required to be paid hereunder.

10.4 Survival. Remedies for breach, rights to accrued payments, and the following Articles and Sections shall survive the expiration or termination of this Agreement: 1 (Definitions), 2.2 (Restrictions), 4 (Payments), 5 (Compliance Duties), 6.3 (Warranty), 6.4 (Development Stage Acknowledgement), 6.5 (Stability and Handling Acknowledgement), 6.6 (Disclaimer), 7 (Indemnification), 8 (Confidentiality and Publicity), 9 (Intellectual Property), 10.3 (Effect of Termination), 10.4 (Survival), and 12 (Miscellaneous).

## Article 11
## FORCE MAJEURE

11.1 Force Majeure. In the event that either Party is prevented from performing its obligations under this Agreement as a result of any contingency beyond its reasonable control ("***Force Majeure***"), including any actions of Governmental Authorities or agencies, war, terrorism, hostilities between nations, civil commotions, riots, strikes, lockouts, sabotage, shortages in supplies (but only to the extent such shortages are not caused by the nonperforming Party), pandemics (such as the events connected with the 2019 novel coronavirus disease (COVID-19)), epidemics, or quarantines, energy shortages, fire, floods and acts of nature such as typhoons, hurricanes, earthquakes, or tsunamis, the Party so affected shall not be responsible to the other Party for any delay or failure of performance of its obligations hereunder, for so long as Force Majeure prevents such performance. In the event of Force Majeure, the Party immediately affected thereby shall give prompt written notice to the other Party specifying the Force Majeure event complained of, and shall use reasonable efforts to resume performance of its obligations.

Article 12
**MISCELLANEOUS**

12.1 Contract Construction. In construing this Agreement, unless expressly specified otherwise: (a) references to this Agreement include all exhibits, addenda and schedules hereto, if any; (b) references to Articles and Sections are to sections of, and exhibits to, this Agreement and references to an Article or Section shall include all subsections subordinate to such Article or Section (e.g., "Section 2.1" would include Sections 2.1, 2.1.x and 2.1.x.y); (c) except where the context otherwise requires, use of either gender includes the other gender, and use of the singular includes the plural and vice versa; (d) any phrase, list or examples following the word "including" shall be interpreted without limitation to the generality of the preceding words; (e) words such as "herein", "hereof", and "hereunder" refer to this Agreement as a whole and not merely to the particular provision in which such words appear, (f) except where the context otherwise requires, the word "or" is used in the inclusive sense (i.e., "and/or"); (g) all references to "dollars" or "$" herein shall mean U.S. Dollars; and (h) all references to "days" means calendar days unless otherwise identified as "Business Days".

12.2 Notice. Any notice required by this Agreement shall be in writing and shall be delivered as follows with notice deemed given as indicated: (a) by personal delivery when delivered personally; (b) by overnight or international courier service upon written verification of receipt; (c) by certified or registered mail, return receipt requested, upon verification of receipt; or (d) by electronic mail, upon successful transmission. Notice shall be sent to the addresses set forth below, as may be updated in writing from time to time by the applicable Party.

(a) If to Arcturus:

Arcturus Therapeutics, Inc.
10628 Science Center Drive, Suite 250
San Diego, CA 92121, USA
Attention: [* * *]
Email: [* * *]

with a copy (which shall not constitute notice) to:

Arcturus Therapeutics, Inc.
10628 Science Center Drive, Suite 250
San Diego, California 92121, USA
Attention: [* * *]
Email: [* * *]

(b) If to Vinbiocare:

Vinbiocare Biotechnology Joint Stock Company
[* * *]
Attention: [* * *]
Email: [* * *]

12.3 Subcontracting. Either Party may subcontract all or any part of its obligations under this Agreement to any third party selected by that Party. The subcontracting Party shall remain responsible for all activities assigned to each such subcontractor.

12.4 Assignment and Delegation. Neither this Agreement, any rights nor any interest hereunder shall be assignable or delegable by either Party without prior written consent of the other Party, such consent not to be unreasonably withheld, except that [* * *]. This Agreement shall be binding upon the successors and permitted assigns and delegees of the Parties and the name of a Party appearing herein shall be deemed to include the name of such Party's successors and permitted assigns and delegees to the extent necessary to carry out the intent of this Agreement. Any assignment that does not comply with this Section 12.4 shall be void.

12.5 Further Actions. Each Party agrees to execute, acknowledge and deliver such further instruments, and to do all such other acts, as may be necessary or appropriate in order to carry out the purposes and intent of this Agreement.

12.6 Waiver. No provision of this Agreement shall be waived by any act, omission or knowledge of any Party or its agents or employees except by an instrument in writing expressly waiving such provision and signed by a duly authorized officer of the waiving Party.

12.7 Descriptive Headings. The descriptive headings of this Agreement are for convenience only, and shall be of no force or effect in construing or interpreting any of the provisions of this Agreement.

12.8 Governing Law and Venue.

(a) This Agreement shall be governed by and construed in accordance with the laws of England and Wales without applying any principles of conflicts of laws that would result in the application of a different body of law.

(b) The United Nations Convention on Contracts for the International Sale of Goods is hereby excluded by the Parties and shall not apply to this Agreement.

(c) Any dispute, controversy, or claim arising out of or in relation to this Agreement, or the existence, breach, termination or invalidity thereof shall be settled, insofar as it is possible, by mutual consultation and consent. If the Parties are unable to resolve such dispute within thirty (30) days commencing discussions to resolve the dispute by mutual consultation and consent, the dispute shall be finally resolved by arbitration in Singapore in accordance with the Arbitration Rules of the Singapore International Arbitration Centre ("***SIAC Rules***" ) for the time being in force, conducted in the English language, which rules are deemed to be incorporated by reference in this clause. All disputes shall be heard by a single arbitrator, unless the claim amount exceeds USD $1,000,000 in which case the dispute shall be heard by a panel of three (3) arbitrators. In any action or proceeding to enforce rights under this Agreement, the prevailing party will be entitled to recover costs and attorneys' fees.

12.9 Severability. Whenever possible, each provision of this Agreement will be interpreted in such manner as to be effective and valid under Applicable Law, but if any provision of this Agreement is held to be prohibited by or invalid under Applicable Law, such provision will be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of this Agreement.

12.10 Independent Contractors. This relationship between Parties created by this Agreement is one of independent contractors and neither Party shall have the power or authority to bind or obligate the other except as expressly set forth in this Agreement.

12.11 Entire Agreement Amendments. This Agreement and the License Agreement constitute the entire understanding and agreement between the Parties with respect to the subject matter of this Agreement and

supersede any and all prior agreements, understandings and arrangements, whether oral or written, between the Parties relating to the subject matter of this Agreement. For avoidance of doubt, this Agreement does not supersede any confidentiality agreement previously entered into by the Parties, which shall exist in accordance with their terms. No term of this Agreement may be amended except upon written agreement of both Parties, unless otherwise expressly provided in this Agreement.

12.12 English Language. This Agreement is written in the English language, which shall be controlling for all purposes. No translation of this Agreement into any other language shall be of any force or effect in the interpretation of this Agreement or in a determination of the intent of the Parties hereto.

12.13 Rights of Third Parties. Nothing in this Agreement is intended to confer on any person any right to enforce any term of this Agreement which that person would not have had but for the Contracts (Rights of Third Parties) Act 1999 ("***Third Party Rights Ac***t"). Any right or remedy of a third party that existed or is available apart from the Third Party Rights Act is not affected.

12.14 Counterparts. This Agreement may be executed in counterparts, each of which will be considered an original, but all of which together will constitute the same instrument. Once signed, any reproduction of this Agreement made by reliable means (e.g., photocopy, portable document format (PDF) or facsimile) is considered an original.

*[Signature page follows]*

To evidence their agreement to be bound by this Agreement, Vinbiocare and Arcturus have executed and delivered this Agreement as of the Effective Date.

| ARCTURUS THERAPEUTICS, INC. | VINBIOCARE BIOTECHNOLOGY JOINT STOCK COMPANY |
|---|---|
| By: _____ | By: _____ |
| Name: | Name: _____ |
| Its: | Its: _____ |

EXHIBIT A

Additional Terms

Section 2.3. Forecasting.

Section 2.4 Orders.

Section 2.5 Inventory Requirements.

Section 3.3 Shipping.

Section 3.4 Packaging.

Section 3.6 Inspection; Acceptance; Right of Rejection.

**Exhibit 31.1**

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER**

I, Joseph E. Payne, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arcturus Therapeutics Holdings Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 9, 2021

By: /s/ Joseph E. Payne

**Joseph E. Payne**
**President and Chief Executive Officer**

**Exhibit 31.2**

**CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER**

I, Andy Sassine, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arcturus Therapeutics Holdings Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 9, 2021

By: /s/ Andy Sassine

**Andy Sassine**
**Chief Financial Officer**

**Exhibit 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**

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 June 30, 2021 (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: August 9, 2021

By: /s/ Joseph E. Payne

**Joseph E. Payne**
**President and Chief Executive Officer**

**Exhibit 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**

The undersigned, the Chief Financial 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 June 30, 2021 (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: August 9, 2021

By: /s/ Andy Sassine

**Andy Sassine**
**Chief Financial Officer**