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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, 2024

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: 001-38869

HOOKIPA PHARMA INC.
(Exact Name of Registrant as Specified in its Charter)

Delaware	**81-5395687**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
350 Fifth Avenue, 72nd Floor, Suite 7240 New York, New York	
(Address of principal executive offices)	**10118 (Zip Code)**

Registrant's telephone number, including area code: +43 1 890 63 60

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

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	HOOK	The Nasdaq Capital Market

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 Act). Yes ☐ No ☒

As of August 5, 2024, the registrant had 9,655,022 shares of common stock and 2,399,517 shares of Class A common stock outstanding, each $0.0001 par value per share.

FORWARD-LOOKING STATEMENTS

This Quarterly Report on Form 10-Q contains forward-looking statements which are made pursuant to the safe harbor provisions of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). These statements may be identified by such forward-looking terminology as "may," "should," "expects," "intends," "plans," "anticipates," "believes," "estimates," "predicts," "potential," "continue" or the negative of these terms or other comparable terminology. Our forward-looking statements are based on a series of expectations, assumptions, estimates and projections about our company, are not guarantees of future results or performance and involve substantial risks and uncertainty. We may not actually achieve the plans, intentions or expectations disclosed in these forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in these forward-looking statements. Our business and our forward-looking statements involve substantial known and unknown risks and uncertainties, including the risks and uncertainties inherent in our statements regarding:

- the success, cost and timing of our product development activities and clinical trials;
- there is substantial doubt regarding our ability to continue as a going concern;
- the timing, scope or likelihood of regulatory filings and approvals, including timing of Investigational New Drug Application and Biological Licensing Application filings for our current and future product candidates, and final U.S. Food and Drug Administration, European Medicines Agency or other foreign regulatory authority approval of our current and future product candidates;
- our ability to develop and advance our current product candidates and programs into, and successfully complete, clinical studies;
- our manufacturing, commercialization and marketing capabilities and strategy;
- the potential benefits of and our ability to maintain our collaboration with Gilead Sciences, Inc. and establish or maintain future collaborations or strategic relationships or obtain additional funding;
- the rate and degree of market acceptance and clinical utility of our current and future product candidates;
- our intellectual property position, including the scope of protection we are able to establish and maintain for intellectual property rights covering our non-replicating and replicating technologies and the product candidates based on these technologies, the validity of intellectual property rights held by third parties, and our ability not to infringe, misappropriate or otherwise violate any third-party intellectual property rights;
- future agreements with third parties in connection with the commercialization of our product candidates and any other approved product;
- regulatory developments in the United States and foreign countries;
- competitive companies and technologies in our industry and the success of competing therapies that are or may become available;
- our ability to attract and retain key scientific or management personnel;
- our ability to obtain funding for our operations, including funding necessary to complete further development and commercialization of our product candidates;
- the accuracy of our estimates of our annual total addressable market, future revenue, expenses, capital requirements and needs for additional financing;
- our expectations about market trends;

- our ability to comply with Nasdaq listing rules; and
- our expectations regarding the period during which we qualify as an emerging growth company under the Jumpstart Our Business Startups Act of 2012, as amended.

All of our forward-looking statements are as of the date of this Quarterly Report on Form 10-Q only. In each case, actual results may differ materially from such forward-looking information. We can give no assurance that such expectations or forward-looking statements will prove to be correct. An occurrence of or any material adverse change in one or more of the risk factors or risks and uncertainties referred to in this Quarterly Report on Form 10-Q or included in our other public disclosures or our other periodic reports or other documents or filings filed with or furnished to the Securities and Exchange Commission could materially and adversely affect our business, prospects, financial condition and results of operations. Except as required by law, we do not undertake or plan to update or revise any such forward-looking statements to reflect actual results, changes in plans, assumptions, estimates or projections or other circumstances affecting such forward-looking statements occurring after the date of this Quarterly Report on Form 10-Q, even if such results, changes or circumstances make it clear that any forward-looking information will not be realized. Any public statements or disclosures by us following this Quarterly Report on Form 10-Q that modify or impact any of the forward-looking statements contained in this Quarterly Report on Form 10-Q will be deemed to modify or supersede such statements in this Quarterly Report on Form 10-Q.

Investors and others should note that we announce material financial information to our investors using our investor relations website (https://ir.hookipapharma.com/), Securities and Exchange Commission filings, press releases, public conference calls and webcasts. We use these channels, as well as social media, to communicate with our members and the public about our company, our services and other issues. It is possible that the information we post on social media could be deemed to be material information. Therefore, we encourage investors, the media, and others interested in our company to review the information we post on the U.S. social media channels listed on our investor relations website.

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PART I—FINANCIAL INFORMATION

Item 1. Financial Statements.

HOOKIPA PHARMA INC.
CONDENSED CONSOLIDATED BALANCE SHEETS (UNAUDITED)
(In thousands, except share amounts)

	June 30, 2024	December 31, 2023
Assets		
Current assets:		
Cash and cash equivalents	$ 77,150	$ 117,096
Accounts receivable	82	511
Receivable research incentives	22,479	18,760
Prepaid expenses and other current assets	7,640	10,749
Total current assets	107,351	147,116
Non-current assets:		
Restricted cash	203	425
Property, plant and equipment, net	7,007	7,742
Operating lease right of use assets	5,013	5,473
Prepaid expenses and other non-current assets	5,472	581
Total non-current assets	17,695	14,221
Total assets	$ 125,046	$ 161,337
Liabilities and Stockholders' Equity		
Current liabilities		
Accounts payable	$ 11,314	$ 12,498
Deferred revenues	4,099	14,631
Operating lease liabilities, current	1,507	1,638
Accrued expenses and other current liabilities	10,914	12,101
Loans payable, current	—	1,120
Total current liabilities	27,834	41,988
Non-current liabilities		
Operating lease liabilities, non-current	3,391	3,801
Deferred revenues, non-current	1,931	19,674
Other non-current liabilities	5,826	6,017
Total non-current liabilities	11,148	29,492
Total liabilities	38,982	71,480
Commitments and contingencies (Note 13)		
Stockholders' equity:		
Preferred stock, $0.0001 par value; 10,000,000 shares authorized at June 30, 2024 and December 31, 2023, respectively; Series A convertible preferred stock, 2,978 shares designated, 370 shares outstanding at June 30, 2024 and December 31, 2023, respectively; Series A-1 convertible preferred stock, 15,800 shares designated, 10,800 shares outstanding at June 30, 2024 and December 31, 2023, respectively; Series A-2 convertible preferred stock, 15,268 shares designated, and 15,268 shares outstanding at June 30, 2024 and December 31, 2023, respectively	0	0
Common stock, $0.0001 par value; 40,000,000 shares and 20,000,000 shares authorized at June 30, 2024 and December 31, 2023, respectively; 9,655,022 shares issued and outstanding at June 30, 2024 and December 31, 2023, respectively	1	1
Class A common stock, $0.0001 par value; 3,900,000 shares authorized at June 30, 2024 and December 31, 2023, respectively; 2,399,517 shares issued and outstanding at June 30, 2024 and December 31, 2023, respectively	0	0
Additional paid-in capital	467,260	467,050
Accumulated other comprehensive loss	(7,224)	(7,933)
Accumulated deficit	(373,973)	(369,261)
Total stockholders' equity	86,064	89,857
Total liabilities and stockholders' equity	$ 125,046	$ 161,337

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

HOOKIPA PHARMA INC.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS
(UNAUDITED)

(In thousands, except share and per share amounts)

	Three months ended June 30,		Six months ended June 30,	
	2024	2023	2024	2023
Revenue from collaboration and licensing	$ 1,290	$ 2,679	$ 37,889	$ 5,855
Operating expenses:				
Research and development	(19,749)	(19,706)	(39,917)	(40,637)
General and administrative	(3,945)	(4,445)	(8,001)	(9,347)
Restructuring	(54)	—	(1,323)	—
Total operating expenses	(23,748)	(24,151)	(49,241)	(49,984)
Loss from operations	(22,458)	(21,472)	(11,352)	(44,129)
Other (expense) income:				
Grant income	$ 2,508	$ 2,217	$ 4,741	$ 4,570
Interest income	1,073	1,311	2,404	2,482
Interest expense	—	(97)	(2)	(219)
Other (expense) income, net	(218)	25	(503)	(195)
Total other income, net	3,363	3,456	6,640	6,638
Net loss before tax	(19,095)	(18,016)	(4,712)	(37,491)
Income tax expense	(0)	(0)	(0)	(205)
Net loss	(19,095)	(18,016)	(4,712)	(37,696)
Other comprehensive loss:				
Foreign currency translation gain (loss), net of tax	178	(69)	709	(86)
Comprehensive loss	$ (18,917)	$ (18,085)	$ (4,003)	$ (37,782)
Net loss per share — basic and diluted[1]	$ (1.52)	$ (2.18)	$ (0.38)	$ (4.86)

[1] Share and per share amounts have been restated to reflect the one-for-ten reverse stock split effected in July 2024 on a retroactive basis for all periods presented.

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

HOOKIPA PHARMA INC.

CONDENSED CONSOLIDATED STATEMENTS OF CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' EQUITY (UNAUDITED)

(In thousands, except share amounts)

	Convertible Preferred Stock		Common Stock				Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total Stockholders' Equity
			Common Stock(1)		Class A Common Stock					
	Shares	Amount	Shares	Amount	Shares	Amount				
Balances as of December 31, 2023	**26,438**	**0**	**9,655,022**	**1**	**2,399,517**	**0**	**467,050**	**(7,933)**	**(369,261)**	**89,857**
Foreign currency translation adjustment, net of tax	—	—	—	—	—	—	—	531	—	531
Stock-based compensation income	—	—	—	—	—	—	(249)	—	—	(249)
Net income	—	—	—	—	—	—	—	—	14,383	14,383
Balances as of March 31, 2024	**26,438**	**$ 0**	**9,655,022**	**$ 1**	**2,399,517**	**$ 0**	**$ 466,801**	**$ (7,402)**	**$ (354,878)**	**$ 104,522**
Foreign currency translation adjustment, net of tax	—	—	—	—	—	—	—	178	—	178
Stock-based compensation income	—	—	—	—	—	—	459	—	—	459
Net loss	—	—	—	—	—	—	—	—	(19,095)	(19,095)
Balances as of June 30, 2024	**26,438**	**$ 0**	**9,655,022**	**$ 1**	**2,399,517**	**$ 0**	**$ 467,260**	**$ (7,224)**	**$ (373,973)**	**$ 86,064**
Balances as of December 31, 2022	**17,497**	**0**	**5,231,713**	**1**	**2,399,517**	**0**	**397,353**	**(7,156)**	**(287,681)**	**102,517**
Issuance of common stock upon exercise of stock options	—	—	569	0	—	—	1	—	—	1
Foreign currency translation adjustment, net of tax	—	—	—	—	—	—	—	(17)	—	(17)
Stock-based compensation expense	—	—	—	—	—	—	658	—	—	658
Net loss	—	—	—	—	—	—	—	—	(19,680)	(19,680)
Balances as of March 31, 2023	**17,497**	**$ 0**	**5,232,282**	**$ 1**	**2,399,517**	**$ 0**	**$ 398,012**	**$ (7,173)**	**$ (307,361)**	**$ 83,479**
Conversion of Series A convertible preferred stock to common stock	(1,327)	(0)	132,700	0	—	—	(0)	—	—	—
Conversion of Series A-1 convertible preferred stock to common stock	(5,000)	(0)	500,000	0	—	—	(0)	—	—	—
Issuance of Series A-2 convertible preferred stock upon public offering at $13,100 per share for cash, net of issuance costs of $1,470	15,268	0	—	—	—	—	18,531	—	—	18,531
Issuance of common stock upon public offering at $13.10 per share for cash, net of issuance costs of $2,205	—	—	2,290,077	0	—	—	27,795	—	—	27,795
ATM costs	—	—	—	—	—	—	(86)	—	—	(86)
Foreign currency translation adjustment, net of tax	—	—	—	—	—	—	—	(69)	—	(69)
Stock-based compensation expense	—	—	—	—	—	—	696	—	—	696
Net loss	—	—	—	—	—	—	—	—	(18,016)	(18,016)
Balances as of June 30, 2023	**26,438**	**$ 0**	**8,155,059**	**$ 1**	**2,399,517**	**$ 0**	**$ 444,948**	**$ (7,242)**	**$ (325,377)**	**$ 112,330**

(1) All share amounts in this column, including appropriate reclassifications between common stock and additional paid-in capital, have been restated to reflect the one-for-ten reverse stock split effected in July 2024 on a retroactive basis for all periods presented.

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

HOOKIPA PHARMA INC.

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS (UNAUDITED)

(In thousands)

	Six months ended June 30,	
	2024	**2023**
Operating activities:		
Net loss	$ (4,712)	$ (37,696)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation expense	210	1,354
Depreciation and amortization expense	1,354	1,787
Other non-cash items	—	4
Changes in operating assets and liabilities:		
Accounts receivable	745	6,257
Receivable research incentives	(4,203)	(4,361)
Prepaid expenses and other current assets	2,600	441
Prepaid expenses and other non-current assets	(4,846)	(124)
Accounts payable	(1,249)	5,188
Deferred revenues	(26,770)	4,899
Operating lease liabilities	(859)	(825)
Accrued expenses and other liabilities	(802)	737
Other non-current liabilities	—	158
Net cash used in operating activities	(38,532)	(22,181)
Investing activities:		
Purchases of property and equipment	(161)	(719)
Net cash used in investing activities	(161)	(719)
Financing activities:		
Proceeds from issuance of convertible preferred stock, net of issuance costs	—	18,793
Proceeds from issuance of common stock, net of issuance costs	—	28,189
Payments for deferred offering costs	(135)	(148)
Repayments of borrowings	(1,141)	(1,754)
Net cash (used in) provided by financing activities	(1,276)	45,080
Net (decrease) increase in cash, cash equivalents and restricted cash	(39,969)	22,180
Cash, cash equivalents and restricted cash at beginning of period	117,521	113,444
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(199)	385
Cash, cash equivalents and restricted cash at end of period	$ 77,353	$ 136,009
Supplemental disclosure of cash flow information:		
Cash paid for interest	$ (2)	$ (10)
Cash paid for income taxes	$ (0)	$ (205)
Supplemental disclosure of non-cash financing activities:		
Property and equipment additions in accounts payable and accrued expenses	$ (6)	$ (168)
Lease assets obtained in exchange for new operating lease liabilities	$ 448	$ —

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

HOOKIPA PHARMA INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

1. Nature of the business and organization

HOOKIPA Pharma Inc. ("HOOKIPA" or the "Company") is a clinical stage biopharmaceutical company developing a new class of immunotherapeutics based on its proprietary arenavirus platform that is designed to reprogram the body's immune system.

The Company was incorporated under the name of Hookipa Biotech, Inc. under the laws of the State of Delaware in February 2017 as a fully-owned subsidiary of Hookipa Biotech AG. In June 2018, the Company changed its name from Hookipa Biotech, Inc. to HOOKIPA Pharma Inc. and in order to effectuate the change of the jurisdiction of incorporation, the Company acquired all of the shares of Hookipa Biotech AG, now HOOKIPA Biotech GmbH. HOOKIPA is headquartered in New York, with European research and preclinical development operations headquartered in Vienna, Austria. In April 2019, the Company closed its initial public offering ("IPO") and its common stock is currently traded on the Nasdaq Capital Market under the ticker symbol "HOOK".

The Company is subject to risks and uncertainties common to early-stage companies in the biotechnology industry, including, but not limited to, development by competitors of new technological innovations, dependence on key personnel, protection of proprietary technology, compliance with government regulations, the ability to establish clinical- and commercial-scale manufacturing processes and the ability to secure additional capital to fund operations. Product candidates currently under development will require significant additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval prior to commercialization. These efforts require significant amounts of additional capital, adequate personnel and infrastructure and extensive compliance-reporting capabilities and may not ultimately lead to a marketing approval and commercialization of a product. Even if the Company's drug development efforts are successful, it is uncertain if and when the Company will realize significant revenue from product sales.

2. Summary of significant accounting policies

Basis of presentation

The Company's condensed consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America ("GAAP"). The accompanying condensed consolidated financial statements include the accounts of the Company and its wholly owned subsidiary. All intercompany accounts and transactions have been eliminated in consolidation.

The consolidated balance sheet as of December 31, 2023 was derived from audited financial statements but does not include all disclosures required by GAAP. The accompanying condensed consolidated balance sheet as of June 30, 2024, the condensed consolidated statements of operations, and comprehensive loss for the three and six months ended June 30, 2024 and 2023, the condensed consolidated statement of convertible preferred stock and stockholders' equity for the three and six months ended June 30, 2024 and 2023 and the condensed consolidated statements of cash flows for the six months ended June 30, 2024 and 2023 are unaudited.

The unaudited interim condensed consolidated financial statements have been prepared on the same basis as the audited annual consolidated financial statements and, in the opinion of management, reflect all adjustments, which include only normal recurring adjustments, necessary for the fair statement for interim reporting. Certain information and footnote disclosures typically included in annual financial statements prepared in accordance with GAAP have been condensed or omitted. Accordingly, these unaudited interim condensed consolidated financial statements should be read in conjunction with the Company's audited financial statements for the year ended December 31, 2023 included in the Company's Annual Report on Form 10-K, filed with the Securities and Exchange Commission ("SEC"). The results for any interim period are not necessarily indicative of results for any future period.

HOOKIPA PHARMA INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

Going concern

At each reporting period, in accordance with Accounting Standards Codification ("ASC") 205-40, Going Concern, the Company evaluates whether there are conditions or events that raise substantial doubt about the Company's ability to continue as a going concern within one year after the date that the financial statements are issued. The Company's evaluation entails analyzing prospective operating budgets and forecasts for expectations of the Company's cash needs and comparing those needs to the current cash and cash equivalent balances. The Company is required to make certain additional disclosures if it concludes substantial doubt exists and it is not alleviated by the Company's plans or when its plans alleviate substantial doubt about the Company's ability to continue as a going concern.

This evaluation initially does not take into consideration the potential mitigating effect of management's plans that have not been fully implemented as of the date the condensed consolidated financial statements are issued. When substantial doubt exists under this methodology, management evaluates whether the mitigating effect of its plans sufficiently alleviates substantial doubt about the Company's ability to continue as a going concern. The mitigating effect of management's plans, however, is only considered if both (1) it is probable that the plans will be effectively implemented within one year after the date that the condensed consolidated financial statements are issued, and (2) it is probable that the plans, when implemented, will mitigate the relevant conditions or events that raise substantial doubt about the entity's ability to continue as a going concern within one year after the date that these condensed consolidated financial statements are issued. In performing its analysis, management excluded certain elements of its operating plan that cannot be considered probable. Under ASC 205-40, the future receipt of potential funding from future partnerships, equity or debt issuances, the potential milestones from the Gilead Collaboration Agreement and potential reductions in force cannot be considered probable at this time because these plans are not entirely within the Company's control and/or have not been approved by the Board of Directors as of the date of these condensed consolidated financial statements.

Since inception, the Company's activities have consisted primarily of performing research and development to advance its technologies. The Company is still in the development phase and has not been marketing its technologies to date. Through June 30, 2024, the Company has funded its operations with proceeds from sales of common stock, sales of convertible preferred stock, sales of redeemable convertible preferred stock, collaboration and licensing agreements, grants and borrowings under various agreements with foreign public funding agencies. Since inception, the Company has incurred recurring losses, including a net loss of $4.7 million for the six months ended June 30, 2024 and $81.6 million for the year ended December 31, 2023. As of June 30, 2024, the Company had an accumulated deficit of $374.0 million. The Company expects to continue to generate operating losses in the foreseeable future. As of the filing date of this Quarterly Report on Form 10-Q, the Company's expectation to generate negative operating cash flows in the future and the need for additional funding to support its planned operations raise substantial doubt regarding the Company's ability to continue as a going concern for a period of one year after the date that these condensed consolidated financial statements are issued. Management's plans to alleviate the conditions that raise substantial doubt include reduced spending and the pursuit of additional capital. Management has concluded that the likelihood that its plan to successfully obtain sufficient funding, or adequately reduce expenditures, while reasonably possible, is less than probable. Accordingly, the Company has concluded that substantial doubt exists about the Company's ability to continue as a going concern for a period of at least 12 months from the date of issuance of these condensed consolidated financial statements.

These condensed consolidated financial statements have been prepared assuming that the Company will continue as a going concern, which contemplates the realization of assets and the settlement of liabilities and commitments in the normal course of business. The condensed consolidated financial statements do not reflect any adjustments relating to the recoverability and classification of assets or the amounts and classification of liabilities that might result from the outcome of the uncertainties described above.

HOOKIPA PHARMA INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

Reverse stock split

On July 9, 2024, the Company effected a reverse stock split of the outstanding shares of its common stock on a one-for-ten (1:10) basis (the "Reverse Stock Split"). The Reverse Stock Split became effective at 5:00 p.m. Eastern Time on July 9, 2024 (the "Effective Time") via a certificate of amendment to the Company's Certificate of Incorporation filed with the Secretary of State of the State of Delaware. At the Effective Time of the Reverse Stock Split, every 10 issued and outstanding shares of the Company's common stock were automatically combined into one issued and outstanding share of common stock. The par value per share of the common stock remained unchanged at $0.0001. Fractional shares were not issued in connection with the Reverse Stock Split. Stockholders who were otherwise entitled to receive a fractional share received a proportional cash payment. The Reverse Stock Split affected all stockholders uniformly and did not alter any stockholder's relative interest in the Company's equity securities, except for any adjustments for fractional shares. As a result of the Reverse Stock Split, proportionate adjustments were made to the conversion ratio for the Company's Class A Common Stock and the conversion prices of the Company's Series A Convertible Preferred Stock, Series A-1 Convertible Preferred Stock and Series A-2 Convertible Preferred Stock. All share, per share and option numbers and exercise prices appearing in this Quarterly Report on Form 10-Q and the accompanying condensed financial statements have been adjusted to give effect to the Reverse Stock Split for all prior periods presented. However, the Company's annual, other periodic, and current reports, and all other information and documents incorporated by reference into this Quarterly Report on Form 10-Q that were filed prior to July 9, 2024, do not give effect to the Reverse Stock Split (see Note 16).

Use of estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue, income and expenses during the reporting periods. Significant estimates and assumptions reflected in these condensed consolidated financial statements include, but are not limited to, the recognition of revenue and income, the accrual of research and development expenses and general and administrative expenses, the present value of lease right of use assets and corresponding liabilities, the valuation of stock-based awards, the valuation of current loans payable, the impairment of long-lived assets and going concern. The Company bases its estimates on historical experience, known trends and other market-specific or other relevant factors that it believes to be reasonable under the circumstances. On an ongoing basis, management evaluates its estimates as there are changes in circumstances, facts and experience.

As of the date of issuance of these unaudited condensed consolidated financial statements, the Company is not aware of any specific event or circumstance that would require the Company to update estimates, judgments or revise the carrying value of any assets or liabilities. Actual results may differ from those estimates or assumptions.

Deferred offering costs

The Company capitalizes certain legal, professional accounting and other third-party fees that are directly associated with in-process equity financings as deferred offering costs until such financings are consummated. After consummation of an equity financing, these costs are recorded in stockholders' equity as a reduction of the additional paid-in capital on a pro-rata basis generated as a result of the offering. Should the in-process equity financing be abandoned, the deferred offering costs will be expensed immediately as a charge to operating expenses in the condensed consolidated statements of operations and comprehensive loss.

Concentrations of credit risk and of significant suppliers

Financial instruments that potentially expose the Company to concentrations of credit risk consist primarily of cash, cash equivalents and short-term bank deposits held with banks in excess of publicly insured limits. For the three

HOOKIPA PHARMA INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

and six months ended June 30, 2024 and June 30, 2023 the net proceeds from the Company's offerings have been deposited in interest-bearing bank accounts with two of the largest investment grade U.S. financial institutions and have been partially invested in money market funds. The money market funds, held in U.S. dollars, are primarily invested in U.S. and foreign short-term debt obligations. As of June 30, 2024 and December 31, 2023, the Company's cash and cash equivalents included smaller amounts of cash balances held in accounts with regional European banks at the Company's Austrian subsidiary, partially in euros. The Company does not believe that it is subject to unusual credit risk beyond the normal credit risk associated with commercial banking relationships.

The Company relies, and expects to continue to rely, on a small number of vendors to manufacture supplies and raw materials for its development programs. These programs could be adversely affected by a significant interruption in these manufacturing services or the availability of raw materials.

As of June 30, 2024 Gilead Sciences, Inc. ("Gilead") accounted for the majority of the accounts receivable balance. As of December 31, 2023, Gilead and F. Hoffmann-La Roche Ltd. and Hoffmann-La Roche Inc. (together "Roche") accounted for the majority of the accounts receivable balance. For the three months ended June 30, 2024 Gilead and Roche accounted for the majority of the Company's revenues. For the six months ended June 30, 2024 Roche accounted for the majority of the Company's revenues as a result of a contract modification and the recognition of upfront and milestone payments previously recorded as deferred revenues. For the three and six months ended June 30, 2023 Gilead and Roche accounted for the majority of the Company's revenues. Other customers accounted for less than 10.0% of accounts receivable or net revenues. The Company monitors the financial performance of its customers so that it can appropriately respond to changes in their credit-worthiness. To date, the Company has not experienced any significant losses with respect to collection of its accounts receivable.

Cash equivalents

The Company considers all highly liquid investments with maturities of three months or less at the date of purchase to be cash equivalents. As of June 30, 2024 and December 31, 2023, cash equivalents consisted of money market funds and short-term deposits.

Fair value measurements

Certain assets and liabilities are carried at fair value under GAAP. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. Financial assets and liabilities carried at fair value are to be classified and disclosed in one of the following three levels of the fair value hierarchy, of which the first two are considered observable and the last is considered unobservable:

- Level 1 - Quoted prices in active markets for identical assets or liabilities.
- Level 2 - Observable inputs (other than Level 1 quoted prices), such as quoted prices in active markets for similar assets or liabilities, quoted prices in markets that are not active for identical or similar assets or liabilities, or other inputs that are observable or can be corroborated by observable market data.
- Level 3 - Unobservable inputs that are supported by little or no market activity and that are significant to determining the fair value of the assets or liabilities, including pricing models, discounted cash flow methodologies and similar techniques.

The Company's cash equivalents are carried at fair value, determined according to the fair value hierarchy described above (see Note 5).

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

Property and equipment

Property and equipment are stated at cost less accumulated depreciation and amortization. Depreciation and amortization expense is recognized using the straight-line method over the estimated useful life of each asset as follows:

	Estimated useful life
Leasehold improvements	shorter of useful life or term of lease
Laboratory equipment	2 - 10 years
Furniture and fixtures	2 - 10 years
Computer equipment and software	2 - 4 years

Costs for capital assets not yet placed into service are capitalized as construction-in-progress and depreciated once placed into service. Expenditures for repairs and maintenance are charged to expense as incurred. When property and equipment is sold or otherwise disposed of, the cost and related accumulated depreciation are eliminated from the accounts and any resulting gain or loss is reflected in the consolidated statements of operations.

Leases

The determination whether an arrangement qualifies as a lease is made at contract inception. A lease qualifies as a finance lease if any of the following criteria are met at the inception of the lease: (i) there is a transfer of ownership of the leased asset to the Company by the end of the lease term, (ii) the Company holds an option to purchase the leased asset that it is reasonably certain to exercise, (iii) the lease term is for a major part of the remaining economic life of the leased asset, (iv) the present value of the sum of lease payments equals or exceeds substantially all of the fair value of the leased asset, or (v) the nature of the leased asset is specialized to the point that it is expected to provide the lessor no alternative use at the end of the lease term. All other leases are recorded as operating leases and are included in right of use ("ROU") assets and lease liabilities in the consolidated balance sheets. For leases with an initial term of 12 months or less, the Company does not recognize a right of use asset or lease liability. These short-term leases are expensed on a straight-line basis over the lease term.

ROU assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent its obligation to make lease payments arising from the lease. ROU assets and lease liabilities are recognized at the commencement date of the lease based upon the present value of lease payments over the lease term. When determining the lease term, the Company includes options to extend or terminate the lease when it is reasonably certain that the option will be exercised. The Company uses the implicit rate when readily determinable and uses its incremental borrowing rate when the implicit rate is not readily determinable based upon the information available at the commencement date in determining the present value of the lease payments. The incremental borrowing rate is determined using a secured borrowing rate for the same currency and term as the associated lease. The lease payments used to determine ROU assets may include lease incentives, stated rent increases and escalation clauses linked to rates of inflation when determinable and are recognized as ROU asset on the consolidated balance sheet. In addition, certain of the Company's arrangements contain lease and non-lease components. The Company generally separates lease payments from non-lease payments. Operating leases are reflected in operating lease assets, in current operating lease liabilities and non-current operating lease liabilities in the consolidated balance sheets. Finance leases are reflected in finance lease assets, in accrued expenses and other current liabilities and in other non-current operating lease liabilities in the consolidated balance sheets. The ROU asset is tested for impairment in accordance with ASC 360.

Capitalized Software Development Cost

The Company capitalizes certain implementation costs for internal-use software incurred in a cloud computing agreement that is a service contract. Eligible costs associated with cloud computing arrangements, such as software

business applications used in the normal course of business, are capitalized in accordance with ASC 350. These costs are recognized on a straight-line basis in the same line item in the statement of operations and comprehensive loss as the expense for fees for the associated cloud computing arrangement, over the term of the arrangement, plus reasonably certain renewals.

Restructuring

Costs and liabilities associated with restructuring activities are recognized when the actions are probable and estimable, which is when management approves the associated actions. Employee-related severance charges are recognized at the time of communication to employees.

Revenue recognition from collaboration and licensing

The Company recognized revenue from collaboration and license agreements with Gilead and Roche.

Under the collaboration and license agreement with Gilead (as amended and restated, the "Gilead Collaboration Agreement"), the parties agreed to collaborate with respect to two preclinical research programs to evaluate potential vaccine products for the treatment, cure, diagnosis or prevention of the hepatitis B virus ("HBV") and the human immunodeficiency virus ("HIV"). In February 2022, the parties signed an amended and restated collaboration agreement (the "Restated Gilead Collaboration Agreement"), which revised the terms only for the HIV program, whereby the Company took on development responsibilities for the HIV program candidate through a Phase 1b clinical trial. The Company's performance obligations under the terms of the original agreement include one combined performance obligation for each research program (HBV and HIV) comprised of the transfer of intellectual property rights (licenses) and providing research and development services. The terms of the Restated Gilead Collaboration Agreement added an additional performance obligation to perform research and development work for the HIV program. The licenses do not represent distinct performance obligations, because they cannot be used without the research and development services. Payments to the Company under the Restated Gilead Collaboration Agreement include a non-refundable up-front payment, payments for research and development activities, payments based upon the achievement of defined milestones, and if certain future conditions are met, payments for manufacturing services, commercial milestones and royalties on product sales.

Under the research collaboration and license agreement with Roche (the "Roche Collaboration Agreement"), the Company agreed to conduct research and early clinical development through Phase 1b for HB-700, a novel investigational arenaviral immunotherapy for the treatment of KRAS-mutated cancers. The Roche Collaboration Agreement also included an obligation of the Company to deliver a specified package of preclinical data and results with respect to a second program, targeting undisclosed cancer antigens (collectively "UCAs") and an option for Roche to license the UCA program. The Company's performance obligations under the terms of the Roche Collaboration Agreement included one combined performance obligation for the transfer of intellectual property rights (licenses) and providing research and development services for the HB-700 program, and a second, separate performance obligation to perform research and development services with respect to the UCA program. The UCA Option provided a right to license the program at the standalone selling price and therefore did not constitute a separate performance obligation. Payments to the Company under the Roche Collaboration Agreement included a non-refundable up-front payment, payments based upon the achievement of defined milestones, an additional payment if the option for the UCA program was exercised and royalties on product sales. In January 2024, Roche provided written notice of the termination of the collaboration and licensing agreement to the Company resulting in early recognition of revenue previously recorded as deferred revenue. The termination was made according to Roche's right to terminate without cause, acknowledging that, the Company had met all go-forward criteria under the agreement. Upon the collaboration and licensing agreement termination effective date of April 25, 2024, the Company regained full control of the associated intellectual property portfolio and has full collaboration and licensing rights for this program.

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

The Company evaluates its collaboration and licensing arrangements pursuant to ASC 606 Revenue from Contracts with Customers. To determine the recognition of revenue from arrangements that fall within the scope of ASC 606, the Company performs the following five steps: (i) identify the contract(s) with a customer; (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.

Under ASC 606, the Company applies significant judgement to evaluate whether the promises under the collaboration and licensing arrangements represent separate or one or more combined performance obligations, the allocation of the transaction price to identified performance obligations, the timing of revenue recognition, whether the UCA Option constitutes a material right, and the determination of when milestone payments are probable of being received.

Upfront payment and program initiation fee

The non-refundable upfront-payment received by the Company upon signing of the Gilead Collaboration Agreement, and milestone payments that were linked to future performance obligations, were initially recorded as deferred revenue and allocated between the two research program performance obligations. Such amounts are recognized as revenue over the performance period of the respective services on a percent of completion basis using total estimated research and development labor hours (input method) for each of the obligations. The percent of completion basis using labor hours was considered the best measure of progress in which control of the combined performance obligations transfers to the customer, due to the short time intervals in which research results are shared with the collaboration partner and the nature of the work being performed.

The non-refundable program initiation payment received from Gilead upon signing of the Restated Collaboration Agreement was also initially recorded as deferred revenue and is recognized on a percent of completion basis using total estimated research and development costs (input method) for the performance of the obligations. The percent of completion basis using research and development costs was considered the best measure of progress in which control of the performance obligations transfers to the customer, due to the immediate benefit that it adds to the value of the customer’s rights on the program, the short time intervals in which development results are shared and the nature of the work being performed.

The non-refundable upfront-payment received by the Company upon signing of the Roche Collaboration Agreement was initially recorded as deferred revenue and allocated between the HB-700 program and the UCA program. Such amounts were recognized as revenue over the performance period of the respective services on a percent of completion basis using total estimated research and development costs (input method) for each of the obligations during the initial term of the contract. The percent of completion basis using research and development costs was considered the best measure of progress in which control of the performance obligations transfers to the customer.

Reimbursement for services

Under the Gilead Collaboration Agreement and historically under the Roche Collaboration Agreement prior to termination, the Company incurs employee expenses as well as external costs for research, manufacturing and clinical trial activities presented as operating expenses or prepaid expenses. Based on the nature of the Company's responsibilities under the collaboration arrangements, reimbursement of those costs are presented as revenue and not deducted from expenses, as the Company controls the research activities. Amounts of consideration allocated to the performance of research or manufacturing services are recognized over the period in which services are performed. Reimbursements for external costs are recognized as revenues as progress is achieved. Unpaid reimbursement amounts are presented as Accounts Receivable.

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

Research and development milestones

The Gilead Collaboration Agreement includes, and the Roche Collaboration Agreement included, contingent milestone payments related to specified preclinical and clinical development milestones. These milestone payments represent variable consideration that are not initially recognized within the transaction price as they are fully constrained under the guidance in ASC 606, due to the scientific uncertainties and the required commitment from Gilead and Roche. While no further milestone payments are expected under the terminated Roche Collaboration Agreement, the Company will continue to assess the probability of significant reversals for any amounts that become likely to be realized under the Gilead Collaboration Agreement prior to including the variable consideration associated with these payments within the transaction price.

Sales-based milestones and royalty payments

The Gilead Collaboration Agreement also includes, and the Roche Collaboration Agreement included, certain sales-based milestone and royalty payments upon successful commercialization of a licensed product. In accordance with ASC 606-10-55-65 Sales Based or Usage Based Royalties, the Company recognizes revenues from sales-based milestone and royalty payments at the later of (i) the occurrence of the subsequent sale; or (ii) the performance obligation to which some or all of the sales-based milestone or royalty payments has been allocated has been satisfied. The Company anticipates recognizing these milestones and royalty payments if and when subsequent sales are generated from a licensed product by the collaboration partner.

Cost to fulfill contracts

The Company incurs costs for personnel, supplies and other costs related to its laboratory operations as well as fees from third parties and license expenses in connection with its research and development obligations under collaboration and licensing agreements. These costs are recognized as research and development expenses over the period in which services are performed. Sublicense fees triggered by the receipt of payments are capitalized as an asset when the obligation to pay the fee arises. The capitalized asset is amortized over the period in which the revenue from the triggering payment is recognized.

Recent accounting pronouncements

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board ("FASB") or other standard setting bodies that the Company adopts as of the specified effective date.

Recently Issued Accounting Pronouncements

In December 2023, the FASB issued final guidance in ASU No. 2023-09, Income Taxes (ASC 740): Improvements to Income Tax Disclosures requiring entities to provide additional information in the rate reconciliation and disclosures about income taxes paid. For public business entities, the guidance is effective for annual periods beginning after December 15, 2024. The Company does not expect this ASU to have a material impact on the consolidated financial statements.

In November 2023, the FASB issued ASU No. 2023-07, Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures which requires public entities to disclose significant segment expenses regularly provided to the chief operating decision-maker. Public entities with a single reporting segment have to provide all disclosures required by ASC 280, including the significant segment expense disclosures. For public business entities, the guidance is effective for annual periods beginning after December 15, 2024. The Company does not expect this ASU to have a material impact on the consolidated financial statements.

HOOKIPA PHARMA INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

3. Collaboration and Licensing Agreements

Gilead Collaboration and License Agreement

In June 2018, the Company entered into the Gilead Collaboration Agreement whereby the Company and Gilead agreed to collaborate with respect to two preclinical research programs to evaluate potential vaccine products for the treatment, cure, diagnosis or prevention of HBV and HIV. In February 2022, the Company signed the Amended and Restated Collaboration Agreement, which altered key aspects of the collaboration pertaining to the HIV therapeutic. Most importantly, the Amended and Restated Collaboration Agreement allocated additional research and development responsibility to the Company with respect to the Company's HIV candidate and provided for additional funding by Gilead of such research and development activities as well as increased later stage development and commercial milestone payments.

Under the Gilead Collaboration Agreement, the Company granted Gilead an exclusive, royalty-bearing license to the Company's technology platforms. Upon entering into the agreement in June 2018, the Company received a non-refundable $10.0 million upfront payment from Gilead and upon signing of the Restated Gilead Collaboration Agreement in February 2022, the Company received a program initiation fee of $15.0 million. Gilead is also obligated to make additional payments to the Company upon the achievement of pre-clinical, development and commercial milestones. The development milestones amount to $140.0 million for the HBV program, and up to $172.5 million for the HIV program, inclusive of a $10.0 million program completion fee, payable upon Gilead's exercise of the option to pursue further development activities post Phase 1b. The commercial milestones amount to a total of $50.0 million for the HBV program, and $65.0 million for the HIV program. Additionally, Gilead is obligated to pay royalties on net sales for each program. Payments from Gilead generally have a 60-day payment term.

The $10.0 million upfront payment, the $15.0 million initiation fee and $8.0 million in milestone payments were initially recorded as deferred revenue in the consolidated balance sheet and are recognized as revenue when revenue recognition criteria are met. As of June 30, 2024, $6.0 million of such payments were still recorded as a liability in deferred revenues, current and non-current. As of December 31, 2023, $7.5 million of upfront and milestone payments were included as a liability in deferred revenues, current and non-current. Approximately 46% of deferred revenue is expected to be recognized as revenue in the remainder of 2024, 44% in 2025 and the remaining 10% in 2026.

In the three months ended June 30, 2024, the Company recognized $0.5 million of the milestone and initiation payments that were originally recorded as deferred revenue. Furthermore, the Company recognized $0.1 million revenue from cost reimbursements for research and development services. In the three months ended June 30, 2023, the Company recognized $1.4 million of the upfront and milestone payments that were originally recorded as deferred revenue. Furthermore, the Company recognized $0.3 million revenue from cost reimbursements for research and development services.

In the six months ended June 30, 2024, the Company recognized $1.3 million of the milestone and initiation payments that were originally recorded as deferred revenue. Furthermore, the Company recognized $0.2 million revenue from cost reimbursements for research and development services. In the six months ended June 30, 2023, the Company recognized $2.6 million of the upfront and milestone payments that were originally recorded as deferred revenue. Furthermore, the Company recognized $0.8 million revenue from cost reimbursements for research and development services.

Sublicense fees payable to certain licensors of technologies upon the receipt of the deferred upfront and milestone payments, were capitalized as a contract asset and will be amortized over the period in which the revenue from the triggering payment is recognized. As of June 30, 2024 and December 31, 2023, the contract asset relating to the sublicense payment was $0.1 million and $0.1 million, respectively, and there was no liability relating to sublicense payment.

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

Roche Collaboration and License Agreement

In October 2022, the Company entered into the Roche Collaboration Agreement whereby the Company and Roche agreed to collaborate with respect to the development of novel arenaviral immunotherapies for KRAS-mutated cancers and, potentially, a second, novel arenaviral immunotherapeutic program targeting specific undisclosed cancer antigens. In January 2024, Roche provided written notice of the termination of the Roche Collaboration Agreement to the Company. The termination was made according to Roche's right to terminate without cause, acknowledging that the Company had met all go-forward criteria under the agreement. Pursuant to the terms of the Roche Collaboration Agreement, following the termination notice, the Roche Collaboration Agreement terminated on April 25, 2024.

Under the terms of the original Roche Collaboration Agreement, the Company had granted Roche an exclusive, royalty-bearing license to the Company's technology platforms for KRAS-mutated cancers, and an option right to exclusively license a second, novel arenaviral immunotherapeutic program targeting undisclosed cancer antigens. Upon the termination effective date of April 25, 2024, the Company regained full control of the associated intellectual property portfolio and full collaboration and licensing rights for this program.

Upon signing the Roche Collaboration Agreement in October 2022, the Company received a non-refundable upfront payment of $25.0 million. This upfront payment, a $10.0 million milestone payment received in the three months ended March 31, 2023, and a $10.0 million milestone received in the three months ended June 30, 2024 were considered as part of the transaction price and were recognized as revenue when revenue recognition criteria were met over the period in which services were performed. As of June 30, 2024, no liabilities were recorded in deferred revenues, current and non-current. As of December 31, 2023, $26.8 million of such payments were included as a liability in deferred revenues, current and non-current.

The Company considered the termination by Roche as a contract modification of the combined performance obligations and the transaction price. The modification was accounted for on a cumulative catch-up basis, applying the revised percent of completion to the revised transaction price, resulting in an immediate increase of revenue in the period of the modification. The transaction price was recognized as revenue over the remaining performance period using updated total estimated research and development costs. The remaining liability included in deferred revenues was recognized in the three months ended June 30, 2024.

In the three months ended June 30, 2024, the Company recognized revenues of $0.7 million of the upfront and milestone payments that were originally recorded as deferred revenue. In the three months ended June 30, 2023, the Company recognized $1.0 million of the upfront and milestone payments that were originally recorded as deferred revenue.

In the six months ended June 30, 2024, the Company recognized revenues of $36.3 million of the upfront and milestone payments that were originally recorded as deferred revenue. Furthermore, the Company recognized $0.1 million revenue from cost reimbursements for activities related to the preparation of a first in human trial of HB-700. In the six months ended June 30, 2023, the Company recognized $2.5 million of the upfront and milestone payments that were originally recorded as deferred revenue.

Sublicense fees payable to certain licensors of technologies upon the receipt of the deferred upfront and milestone payments, were capitalized as a contract asset and will be amortized over the period in which the revenue from the triggering payment is recognized. As of June 30, 2024 there was no contract asset and no liability relating to sublicense payments. As of December 31, 2023 the contract asset was $2.0 million and there was no liability relating to sublicense payments.

HOOKIPA PHARMA INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

4. Restructuring

On January 29, 2024, the Company announced and began implementing its decision to prioritize the clinical development of its eseba-vec (formerly HB-200) program for the treatment of HPV16+ head and neck cancers and its two Gilead-partnered infectious disease programs and to pause development activities related to HB-300 and most of its preclinical research activities. In connection with this strategic refocus, the Company's board of directors approved a restructuring plan to rebalance the Company's cost structure, which includes a reduction of the Company's workforce by approximately 30% and the discontinuation of the Company's GMP manufacturing facility project. The restructuring plan was completed as of June 30, 2024.

As a result of the restructuring plan, the Company incurred the following charges which were included within Restructuring in the condensed consolidated statements of operations and comprehensive loss.

The following table summarizes the effect of the restructuring charges (in thousands):

	Three months ended June 30,		Six months ended June 30,	
	2024	2023	2024	2023
Severance and other personnel expenses	15	—	1,238	—
Professional fees and other related charges	39	—	85	—
Total	$ 54	$ —	$ 1,323	$ —

There was no restructuring liability as of June 30, 2024.

5. Fair Value of Financial Assets

The following tables present information about the Company's financial assets measured at fair value on a recurring basis and indicating the level of the fair value hierarchy utilized to determine such fair values (in thousands):

	Fair Value Measurement at June 30, 2024			
	Level 1	Level 2	Level 3	Total
Cash equivalents:				
Money market funds	$ 70,281	$ —	$ —	$ 70,281
Total	$ 70,281	$ —	$ —	$ 70,281

	Fair Value Measurement at December 31, 2023			
	Level 1	Level 2	Level 3	Total
Cash equivalents:				
Money market funds	$ 91,084	$ —	$ —	$ 91,084
Total	$ 91,084	$ —	$ —	$ 91,084

During the six months ended June 30, 2024, there were no transfers between Level 1, Level 2 and Level 3.

HOOKIPA PHARMA INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

6. Property, plant and equipment, net

Property, plant and equipment, net consisted of the following (in thousands):

	June 30, 2024	December 31, 2023
Land	$ 1,961	$ 2,025
Leasehold improvements	3,202	3,300
Construction in progress	13	212
Laboratory equipment	8,451	8,722
Furniture and fixtures	630	654
Computer equipment and software	2,457	2,652
Property and equipment, gross	16,714	17,565
Less: Accumulated depreciation	(9,707)	(9,823)
Property and equipment, net	$ 7,007	$ 7,742

7. Receivable research incentive

The Company participates in a research incentive program provided by the Austrian government under which it is entitled to reimbursement of a percentage of qualifying research and development expenses and capital expenditures incurred in Austria. Submissions for reimbursement under the program are submitted annually. Incentive amounts are generally paid out during the calendar year that follows the year of the expenses but remain subject to subsequent examinations by the responsible authority. Reimbursements received in excess of the recognized receivable research incentive for a certain period are recorded within other long-term liabilities for potential repayment until such time that an audit has taken place, upon expiration of the potential reclaim period, or when it is no longer probable that a reclaim will happen. The years 2018 to present remain open to examination by the authorities.

Furthermore, the Company participated in the life sciences research and development program provided by the New York State government under which it was entitled to reimbursement of a percentage of qualifying research and development expenses in New York State up to $0.5 million per year for the years 2019 to 2021. The Company also participates in the New York City biotechnology tax credit program, according to which certain expenses for business in the biotechnology field in New York City limited to $0.25 million per year for three consecutive years from January 1, 2023 to December 31, 2025 are incentivized.

As of June 30, 2024, the Company recognized receivables of $22.5 million from the research incentive programs, which are reported in receivable research incentive in the Company's condensed consolidated balance sheet. $21.4 million relate to the Austrian research incentive program, $1.0 million relate to the New York State life sciences research and development program and $0.1 million relate to the New York City biotechnology tax credit program. As of December 31, 2023, the receivables from the research incentive programs were $18.8 million with $17.3 million related to the Austrian research incentive program, $1.4 million related to the New York State life sciences research and development program and $0.1 million related to the New York City biotechnology tax credit program.

During the three months ended June 30, 2024 and 2023, the Company recorded $2.5 million and $2.1 million, respectively, of income related to the incentive program within the Company's condensed consolidated statements of operations and comprehensive loss as part of the grant income related to the Austrian incentive program. Research incentives depend on the eligible research and development expenses of the respective period.

During the six months ended June 30, 2024 and 2023, the Company recorded $4.7 million and $4.3 million, respectively, of income related to the incentive program within the Company's condensed consolidated statements of

operations and comprehensive loss as part of the grant income related to the Austrian incentive program. Research incentives depend on the eligible research and development expenses of the respective period.

8. Accrued expenses and other current liabilities

Accrued expenses and other current liabilities consisted of the following (in thousands):

	June 30, 2024	December 31, 2023
Salaries and bonuses	3,597	5,665
Social security contributions	425	340
Unearned grant income (current)	—	52
Accrued external research and development expenses	5,248	4,594
Accrued external general and administration expenses	599	292
Accrued for property and equipment acquisitions	—	14
Income taxes	206	367
Other accruals and liabilities	839	777
	$ 10,914	$ 12,101

9. Loans payable

As of June 30, 2024 and December 31, 2023, loans payable consisted of the following (in thousands):

	June 30, 2024	December 31, 2023
Loans from FFG	$ —	$ 1,172
Unamortized debt discount	—	(52)
Total loans payable, net	$ —	$ 1,120

In connection with the funding agreements with the Austrian Research Promotion Agency, (*Österreichische Forschungsförderungsgesellschaft,* or "FFG"), the Company has received various loans ("FFG Loans"). The FFG Loans were made on a project-by-project basis.

The FFG Loans bear interest at rates that are below market rates of interest. The Company accounted for the imputed benefit arising from the difference between an estimated market rate of interest and the rate of interest charged by FFG as grant income from FFG. On the date that FFG loan proceeds are received, the Company recognized the portion of the loan proceeds allocated to grant funding as a discount to the carrying value of the loan and as unearned income, which was recognized as grant income over the term of the funding agreement.

As of June 30, 2024, the Company has no outstanding loans payable. A final principal repayment of $1.1 million was made in the three and six months ended June 30, 2024. A principal repayment of $1.2 million was made in the three months ended June 30, 2023 and principal repayments of $1.8 million were made in the six months ended June 30, 2023.

10. Common stock, Class A common stock and convertible preferred stock

The Company's capital structure consists of common stock, Class A common stock and preferred stock. On July 9, 2024, the Company effected a reverse stock split of the outstanding shares of its common stock on a one-for-ten basis (see Notes 2 and 16). As of June 30, 2024, the Company was authorized to issue 40,000,000 (400,000,000 before the Reverse Stock Split) shares of common stock, 3,900,000 shares of Class A common stock and 10,000,000 shares of

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

preferred stock. The Company has designated 2,978 of the 10,000,000 authorized shares of preferred stock as non-voting Series A convertible preferred stock, 15,800 of the 10,000,000 authorized shares of preferred stock as non-voting Series A-1 convertible preferred stock and 15,268 of the 10,000,000 authorized shares of preferred stock as non-voting Series A-2 convertible preferred stock. As of June 30, 2024, the Company had 9,655,022 (96,550,590 before the Reverse Stock Split) shares of common stock, 2,399,517 shares of Class A common stock, 370 shares of Series A convertible preferred stock, 10,800 shares of Series A-1 convertible preferred stock and 15,268 shares of Series A-2 convertible preferred stock outstanding and issued. As a result of the Reverse Stock Split, 37 shares of common stock were retired due to round-down effects and redeemed in cash.

On June 5, 2023, the Company closed a public offering of 2,290,077 (22,900,768 before the Reverse Stock Split) shares of its common stock and 15,268 shares of Series A-2 convertible preferred stock at a public offering price of $13.10 and $1,310.00 per share, respectively, for net proceeds of $46.2 million after deducting underwriting discounts and commissions and offering expenses.

On February 15, 2022, the Company entered into a stock purchase agreement with Gilead (“Stock Purchase Agreement”), that requires Gilead, at the Company’s option, to purchase up to $35.0 million of the Company’s common stock. On February 15, 2022, Gilead purchased an initial amount of 166,666 (1,666,666 before the Reverse Stock Split) shares of the Company’s common stock in exchange for $5.0 million in cash at a purchase price per share equal to $30.00. On December 20, 2023, the parties amended and restated the Stock Purchase Agreement (the “Amended Stock Purchase Agreement”) and Gilead purchased 1,500,000 (15,000,000 before the Reverse Stock Split) shares of the Company’s common stock in exchange for approximately $21.3 million in cash at a purchase price per share equal to $14.167. Pursuant to the terms of the Amended Stock Purchase Agreement, the Company may require Gilead to purchase the balance of the $8.75 million of common stock as pro-rata participation in potential future equity raises. The Company’s right to sell shares of its common stock to Gilead is subject to specified limitations, including a limitation that prevents the Company from requesting purchases of shares of common stock by Gilead that would result in a beneficial ownership of more than 19.9% of the total number of outstanding shares of common stock by Gilead.

The Company has three series of preferred stock authorized, issued and outstanding as of June 30, 2024: Series A convertible preferred stock, Series A-1 convertible preferred stock and Series A-2 convertible preferred stock. Shares of Series A, Series A-1 and Series A-2 convertible preferred stock may be independently converted into common stock. Holders of Series A, Series A-1 and Series A-2 convertible preferred stock have equal rights, powers and privileges.

Holders of common stock are entitled to one vote for each share held on all matters submitted to a vote of the stockholders. The holders of Class A common stock and Series A, Series A-1 and Series A-2 convertible preferred stock are not entitled to vote, except as required by law. The holders of common stock and Class A common stock do not have any cumulative voting rights.

Each holder of Class A common stock has the right to convert each ten shares of Class A common stock into one share of common stock at such holder's election. Each holder of Series A, Series A-1 and Series A-2 convertible preferred stock has the right to convert each share of Series A, Series A-1 and Series A-2 convertible preferred stock into 100 shares of common stock at any time at the holder’s option, provided that the holder will be prohibited, subject to certain exceptions, from converting Series A, Series A-1 and Series A-2 preferred stock into shares of our common stock if, as a result of such conversion, the holder, together with its affiliates, would own more than 9.99% of the total number of shares of the Company’s common stock then issued and outstanding.

Holders of common stock and Class A common stock are entitled to receive ratably any dividends declared by the board of directors out of funds legally available for that purpose, subject to any preferential dividend rights of any outstanding preferred stock. Holders of Series A, Series A-1 and Series A-2 preferred stock will be entitled to receive dividends at a rate equal to (on an as-if-converted-to-common stock basis), and in the same form and manner as,

HOOKIPA PHARMA INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

dividends actually paid on shares of the Company's common stock. Holders of common stock and Class A common stock have no preemptive rights, conversion rights, or other subscription rights or redemption or sinking fund provisions.

In the event of a liquidation, dissolution, or winding up of the Company, holders of our Series A, Series A-1 and Series A-2 preferred stock will receive a payment equal to $0.001 per share of Series A, Series A-1 and Series A-2 preferred stock before any proceeds are distributed to the holders of common stock. Then, holders of common stock and Class A common stock will be entitled to share ratably in all assets remaining after payment of all debts and other liabilities.

There were 370 shares of Series A convertible preferred stock, 10,800 shares of Series A-1 convertible preferred stock and 15,268 shares of Series A-2 convertible preferred stock outstanding as of June 30, 2024 and December 31, 2023, respectively. In May 2023 certain of the Company's stockholders elected to convert an aggregate of 1,327 shares of Series A convertible preferred stock and an aggregate of 5,000 shares of Series A-1 convertible preferred stock owned by such holders into an aggregate of 632,700 (6,327,000 before the Reverse Stock Split) shares of the Company's common stock.

11. Stock-based compensation

2018 Stock Option and Grant Plan

In June 2018, the Company's board of directors approved the 2018 Stock Option and Grant Plan. Options granted under the 2018 Stock Option and Grant Plan generally vest over four years, with 25% of the options vesting upon the first anniversary of the grant date and the remaining 75% of the options vesting in 12 equal quarterly installments following the first anniversary of the grant date, provided the option holder continues to have an employment or service relationship with the Company on each vesting date. The options expire on the 10th anniversary of the grant date. As of June 30, 2024, 75,767 options granted under the 2018 Stock Option and Grant Plan remained outstanding. Any authorization to issue new options under the 2018 Stock Option and Grant Plan was cancelled upon the effectiveness of the 2019 Stock Option and Incentive Plan and no further awards will be granted under the 2018 Plan.

2019 Stock Option and Incentive Plan

On April 1, 2019, the Company's stockholders approved the 2019 Stock Option and Incentive Plan, which became effective as of the effective date of the registration statement in connection with the Company's IPO. The plan provides for the grant of shares of restricted stock, long term incentive awards, stock options or other equity-based awards. As of June 30, 2024, the maximum number of shares of the Company's common stock that may be issued under the Company's 2019 Stock Option and Incentive Plan was 1,202,548 shares which shall be cumulatively increased on January 1 of each year by up to 4.0% of the then outstanding number of shares of common stock and Class A common stock. Options granted under the 2019 Stock Option and Incentive Plan generally vest over four years, with 25% of the options vesting upon the first anniversary of the grant date and the remaining 75% of the options vesting in 12 equal quarterly installments following the first anniversary of the grant date, provided the option holder continues to have an employment or service relationship with the Company on each vesting date. Initial options granted to non-executive directors upon their election generally vest over a three-year term with 33% of the options vesting upon the first anniversary of the grant date and the remaining 67% of the options vesting in eight equal quarterly installments following the first anniversary of the grant date. Option re-grants to non-executive directors generally vest on the first anniversary of the grant date. The options expire on the 10th anniversary of the grant date. For each option, the beneficiary is entitled to receive one share of common stock upon the exercise of the option.

On August 7, 2023, the Company's board of directors approved a one-time offer to eligible non-executive, non-director employees to exchange certain outstanding stock options for new stock options with modified terms. Under the stock option exchange program (the "Offer"), the Company offered to exchange certain out-of-the-money stock options

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

for new stock options at an exchange ratio of between 1.75 and 2.50 surrendered options for one new option exercisable for shares of common stock with a lower exercise price and extended vesting terms. Pursuant to the Offer, a total of 82 eligible participants tendered, and the Company accepted for cancellation, stock options to purchase an aggregate of 54,323 shares of the Company's common stock with exercise prices between $69.00 and $140.00. The eligible options that were accepted for cancellation represented approximately 86.6% of the total shares of common stock underlying all of the eligible options. In accordance with the terms and conditions of the Offer, on September 12, 2023, the Company issued new options to purchase an aggregate of 27,376 shares of common stock in exchange for the cancellation of the tendered eligible options. The exercise price per share of each new option granted in the Offer is $10.00. New options issued for previously vested stock options vest on the first anniversary of the grant date and new options issued for previously unvested stock options vest over a three-year term in twelve equal quarterly installments. The stock option exchange offer resulted in incremental stock-based compensation expense of $0.1 million, which will be recognized using the graded-vesting method over the remaining requisite service period of the new stock options.

2023 Inducement Plan

On April 7, 2023, the Company's board of directors adopted the Company's 2023 Inducement Plan (the "2023 Inducement Plan") pursuant to which the Company reserved 50,000 shares of common stock for issuance under the 2023 Inducement Plan. The 2023 Inducement Plan provides for the grant of non-statutory stock options to eligible individuals. In accordance with Nasdaq Marketplace Rule 5635(c)(4), awards under the 2023 Inducement Plan may only be made to individuals not previously employees or directors of the Company (or following such individuals' bona fide period of non-employment with the Company), as an inducement material to the individuals' entry into employment with the Company. Awards granted under the 2023 Inducement Plan must be approved by either a majority of the Company's independent directors or the compensation committee of the Company's board of directors. As of June 30, 2024, the Company had 5,000 shares of its common stock available for future issuance under the 2023 Inducement Plan.

The following table presents a summary of awards outstanding:

	As of June 30, 2024			
	2018 Plan	2019 Plan	Inducement Awards	Total
Granted and outstanding awards:				
Stock options	75,767	968,293	45,000	1,089,060
Total	75,767	968,293	45,000	1,089,060

Stock option valuation

The Company estimates the option's fair value on the date of grant using the Black-Scholes option-pricing model. Black-Scholes utilizes assumptions related to expected term, volatility, the risk-free interest rate, the dividend and employee exercise behavior. Forfeitures are accounted for when they occur. Expected volatilities utilized in the Black-Scholes model are based on historical volatilities of a group of comparable companies. The group of representative companies have characteristics similar to the Company, including the stage of product development and focus on the life science industry. Management believes that this represents the most accurate basis for estimating expected future volatilities under the current conditions. The risk-free interest rate is derived from the yields for U.S. Treasuries with a remaining term approximating the expected life of the options. The expected term represents the period of time that the options granted are expected to be outstanding.

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

The following table summarizes the assumptions used in the Black-Scholes option-pricing model for estimating the fair value of stock options granted during:

	Three months ended June 30,		Six months ended June 30,	
	2024	2023	2024	2023
Risk-free interest rate	4.53 %	3.57 %	4.53 %	3.57 %
Expected term (in years)	6.1	6.0	6.1	6.0
Expected volatility	101.5 %	94.0 %	101.5 %	94.0 %
Expected dividends	— %	— %	— %	— %

For the 2024 and 2023 grants, the Company used the simplified method in developing an estimate of the expected term due to a lack of historical exercise data.

Stock option activity

The following table summarizes the Company's stock option activity since January 1, 2024 (in thousands, except share and per share amounts):

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value
Outstanding as of December 31, 2023	810,942	$ 42.76	7.4	$ 486
Granted	419,981	7.56		
Exercised	—	—		
Forfeited	(141,863)	30.38		
Outstanding as of June 30, 2024	1,089,060	$ 30.80	7.9	$ 336
Options exercisable as of June 30, 2024	449,338	$ 59.70	6.1	$ 336
Options unvested as of June 30, 2024	639,722	$ 10.50	9.2	$ —

The aggregate intrinsic value of stock options was calculated as the difference between the exercise price of the stock options and the fair value of the Company's common stock for those stock options that had exercise prices lower than the fair value of the Company's common stock. The fair value per common stock used for calculating the intrinsic values as of June 30, 2024 and December 31, 2023, was $5.92 and $8.10, respectively.

No cash was received from stock option exercise under share-based payment arrangements for the six months ended June 30, 2024. Cash received from stock option exercises under share-based payment arrangements for the six months ended June 30, 2023 was $1 thousand.

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

Stock-based compensation

Stock-based compensation expense was classified in the condensed consolidated statements of operations and comprehensive loss as follows (in thousands):

	Three months ended June 30,		Six months ended June 30,	
	2024	2023	2024	2023
Research and development expenses[1]	$ 156	$ 308	$ 3	$ 548
General and administrative expenses[1]	303	388	207	806
	$ 459	$ 696	$ 210	$ 1,354

[1] The six months ended June 30, 2024 includes negative stock-based compensation expense for Research and development expenses that occurred in the three months ended March 31, 2024 as a result of forfeitures.

12. Income taxes

Income tax expense during the six months ended June 30, 2024 and June 30, 2023 resulted from minimum tax obligations in Austria, and U.S. federal and state income tax as well as minimum tax obligations in Austria, respectively. During the three and six months ended June 30, 2024 and 2023, the Company recorded no income tax benefits for the net operating losses incurred due to its uncertainty of realizing a benefit from those items. The Company's losses before income taxes were generated in the United States and Austria. The Company has evaluated the positive and negative evidence bearing upon its ability to realize the deferred tax assets resulting from its net operating loss carryforwards. Management has considered the Company's history of cumulative net losses incurred since inception and its lack of commercialization of any products or generation of any revenue from product sales since inception and has concluded that it is more likely than not that the Company will not realize the benefits of its deferred tax assets. Accordingly, a full valuation allowance has been established against the deferred tax assets as of June 30, 2024 and December 31, 2023. Management reevaluates the positive and negative evidence at each reporting period.

13. Commitments and contingencies

Operating and Finance Leases

The Company leases real estate, including office and laboratory space and has entered into various other agreements with respect to assets used in conducting its business. The Company is required to maintain a cash balance of $0.2 million to secure letters of credit associated with real estate leases. This amount was classified as non-current restricted cash in the Company's condensed consolidated balance sheet as of June 30, 2024.

As of June 30, 2024 and December 31, 2023, the Company's operating lease right-of-use assets were $5.0 million and $5.5 million, respectively, which are reported in operating lease right-of-use assets in the Company's condensed consolidated balance sheets. As of June 30, 2024, the Company had outstanding operating lease obligations of $4.9 million, of which $1.5 million is reported in operating lease liabilities, current portion and $3.4 million is reported in operating lease liabilities, non-current portion in the Company's condensed consolidated balance sheets. As of December 31, 2023, the Company had outstanding operating lease obligations of $5.4 million, of which $1.6 million is reported in operating lease liabilities, current portion and $3.8 million is reported in operating lease liabilities, non-current portion in the Company's condensed consolidated balance sheets. The Company's weighted average discount rate and weighted average lease term remaining on operating lease liabilities is approximately 4.3% and 3.5 years.

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

Contract manufacturing arrangements

The Company has entered into arrangements with contract manufacturing organizations ("CMOs") for manufacturing of materials for research and development purposes, including manufacturing of clinical trial materials. These contracts generally provide for non-cancellable obligations or cancellation penalties depending on the time of cancellation. As of June 30, 2024, the Company's total non-cancellable obligations under contracts with CMOs were $5.2 million, of which $1.0 million relates to 2024 (remaining six months) deliverables, and $4.2 million relates to 2025 deliverables.

Intellectual property licenses

The Company has entered into certain license agreements under which it is obligated to make milestone payments upon the achievement of certain development and regulatory milestones, to pay royalties on net sales of licensed products, and to pay a percentage of the sublicense fees which the Company receives from its sublicensees.

In the three and six months ended June 30, 2024, the Company recorded $0.2 million and $2.9 million, respectively, in licensing fees related to intellectual property licenses as research and development expenses. The amount is mainly related to the upfront payment and milestone payments received by the Company under the Gilead Collaboration Agreement and the Roche Collaboration Agreement. The amount recognized as expenses has been agreed to by the licensors but calculation of sublicensing fees on future payments may be subject to interpretation and may change until agreed to by the receiving party.

Indemnification agreements

In the ordinary course of business, the Company may provide indemnification of varying scope and terms to vendors, lessors, business partners and other parties with respect to certain matters including, but not limited to, losses arising out of breach of such agreements or from intellectual property infringement claims made by third parties. In addition, the Company has entered into indemnification agreements with members of its board of directors and senior management that will require the Company, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors or officers. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is, in many cases, unlimited. To date, the Company has not incurred any material costs as a result of such indemnifications. The Company is not aware of any claims under indemnification arrangements, and it has not accrued any liabilities related to such obligations in its condensed consolidated financial statements as of June 30, 2024 or December 31, 2023.

Legal proceedings

The Company is not currently a party to any material legal proceedings. From time to time, the Company may become involved in litigation or legal proceedings relating to claims arising in the ordinary course of business. At each reporting date, the Company evaluates whether or not a potential loss amount or a potential range of loss is probable and reasonably estimable under the provisions of the authoritative guidance that addresses accounting for contingencies. The Company expenses the costs related to such legal proceedings as incurred.

HOOKIPA PHARMA INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

14. Net loss per share

The following table sets forth the computation of the basic and diluted net loss per share attributable to common stockholders (in thousands, except for per share amounts):

	Three months ended June 30,		Six months ended June 30,	
	2024	2023	2024	2023
Numerator:				
Net loss	$ (19,095)	$ (18,016)	$ (4,712)	$ (37,696)
Denominator:				
Weighted-average common shares outstanding, basic and diluted	9,894,974	6,480,861	9,894,974	5,979,258
Weighted-average Series A convertible preferred shares outstanding, basic and diluted, presented as if converted into common stock[(1)]	37,000	92,413	37,000	130,843
Weighted-average Series A-1 convertible preferred shares outstanding, basic and diluted, presented as if converted into common stock[(1)]	1,080,000	1,277,802	1,080,000	1,428,066
Weighted-average Series A-2 convertible preferred shares outstanding, basic and diluted, presented as if converted into common stock[(1)]	1,526,800	419,451	1,526,800	210,884
Total number of shares used to calculate net loss per share, basic and diluted	12,538,774	8,270,527	12,538,774	7,749,051
Net loss per share, basic and diluted	$ (1.52)	(2.18)	(0.38)	(4.86)

[(1)] Class A common stock, Series A, Series A-1 and Series A-2 convertible preferred stock are participating securities that have substantially the same terms and features as the Company's common stock. The Class A common stock, Series A, Series A-1 and Series A-2 convertible preferred stock is therefore included in the weighted-average number of shares outstanding to calculate net loss per share, basic and diluted as if converted in common stock. Each ten shares of Class A common stock and each share of Series A, Series A-1 and Series A-2 convertible preferred stock is independently convertible into one and 100 shares of common stock, respectively. In the three and six months ended June 30, 2024, 239,952 shares of the Company's common stock were issuable upon conversion of the Class A common stock, 37,000 shares of the Company's common stock were issuable upon conversion of Series A convertible preferred stock, 1,080,000 shares of the Company's common stock were issuable upon conversion of Series A-1 convertible preferred stock and 1,526,800 shares of the Company's common stock were issuable upon conversion of Series A-2 convertible preferred stock (see Note 10).

Since the Company was in a loss position for all periods presented, basic net loss per share is the same as diluted net loss per share for all periods as the inclusion of all potential common shares (common stock and Class A common stock) outstanding would have been anti-dilutive. Potentially dilutive securities that were not included in the diluted per share calculations because they would be anti-dilutive were as follows:

	Three and six months ended June 30,	
	2024	2023
Options issued and outstanding	1,089,060	870,660
Total	1,089,060	870,660

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

15. Related Parties

Effective September 15, 2023, Malte Peters, a member of the Company's board of directors, agreed to lead the Company's clinical activities as ad interim Senior Clinical Advisor. No expense was recorded during the three months ended June 30, 2024. During the six months ended June 30, 2024, the Company recorded expense of $0.2 million related to a consultancy services agreement entered into with Dr. Peters, effective September 15, 2023. The consultancy services agreement was terminated on March 31, 2024.

16. Subsequent Events

Reverse stock split

A one-for-ten Reverse Stock Split of the Company's issued and outstanding shares of common stock was effected on July 9, 2024. Stockholders entitled to fractional shares of common stock as a result of the Reverse Stock Split received a cash payment in lieu of receiving fractional shares of common stock. Accordingly, all share and per share amounts for all periods presented in the accompanying financial statements and notes thereto have been retroactively adjusted, where applicable, to reflect the effects of the Reverse Stock Split. The Reverse Stock Split affected all stockholders uniformly and did not alter any stockholder's relative interest in the Company's equity securities, except for any adjustments for fractional shares. As a result of the Reverse Stock Split, proportionate adjustments were made to the conversion ratio for the Company's Class A Common Stock and the conversion prices of the Company's Series A Convertible Preferred Stock, Series A-1 Convertible Preferred Stock and Series A-2 Convertible Preferred Stock. Proportionate adjustments were also made to the number of shares underlying, and the exercise or conversion prices of, the Company's outstanding stock options and to the number of shares of common stock issuable under the Company's equity incentive plans. The Reverse Stock Split proportionately reduced the number of authorized shares of the Company's common stock (see Note 2).

Officer and director transitions

On July 22, 2024, the Company appointed Dr. Malte Peters as its Chief Executive Officer and issued a restricted stock unit award covering an aggregate of 108,695 shares of common stock, which vests in two equal annual installments upon the first and second anniversaries of Dr. Peters start date subject to his continued employment through each such date. Furthermore, the Company appointed Terry Coelho as its Executive Vice President and Chief Financial Officer and issued a restricted stock unit award covering an aggregate of 69,875 shares of common stock, which vests in two equal annual installments upon the first and second anniversaries of her start date subject to her continued employment through each such date, and paid a one-time signing bonus of $0.2 million. Dr. Peters and Ms. Coelho both retained their positions as directors of the Company.

On July 22, 2024, Joern Aldag separated as the Chief Executive Officer of the Company and resigned as a director of the Company on July 23, 2024. In connection with Mr. Aldag's separation as the Chief Executive Officer of the Company, the Company has agreed to provide Mr. Aldag a severance package consistent with his employment agreement which is expected to include a cash payment of $1.1 million and continued health benefits for six months as part of a six month garden leave period beginning on July 31, 2024. Furthermore, on July 22, 2024 Reinhard Kandera separated as the Chief Financial Officer of the Company and resigned as a director of the Company on July 23, 2024. In connection with Mr. Kandera's separation as the Chief Financial Officer of the Company, the Company has agreed to provide Mr. Kandera a severance package consistent with his employment agreement which is expected to include a cash payment of $0.8 million and continued health benefits for six months as part of a six month garden leave period beginning on July 31, 2024. The unrecognized severance expense will be recognized in the financial statements for the quarter ending September 30, 2024.

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED) (continued)

Appointment of Sean A. Cassidy as a director

On July 22, 2024, the Company's board of directors appointed Sean A. Cassidy as a member of the board of directors and as a member of the compensation committee and chair of the audit committee, succeeding Ms. Coelho as chair of the audit committee. Pursuant to the Company's Non-Employee Director Compensation Policy, Mr. Cassidy was granted an initial stock option to purchase 9,800 shares of the Company's common stock upon appointment to the Company's board of directors.

At-the-Market Offering Program

As previously disclosed, on July 12, 2022, the Company entered into a Sales Agreement with Leerink Partners LLC ("Leerink"), as sales agent, to provide for the issuance and sale by the Company of up to $50.0 million of common stock from time to time in "at-the-market" offerings. On August 5, 2024, the Company delivered a termination notice to Leerink to terminate the Sales Agreement, effective as of August 8, 2024. At the time of termination, $50.0 million remained available for issuance pursuant to the Sales Agreement.

On August 8, 2024, the Company entered into an Open Market Sale Agreement[SM] with Jefferies LLC, as sales agent, to provide for the issuance and sale by the Company of up to $50.0 million of common stock from time to time in "at-the-market" offerings.

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

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our unaudited condensed consolidated financial statements and related notes appearing elsewhere in this Quarterly Report on Form 10-Q and our audited consolidated financial statements and related notes for the year ended December 31, 2023 included in our Annual Report on Form 10-K filed with the Securities and Exchange Commission ("SEC"). As a result of many factors, including those factors set forth in the "Risk Factors" section of our Annual Report on Form 10-K for the year end December 31, 2023, our actual results could differ materially from the results described in, or implied by, the forward-looking statements contained in the following discussion and analysis.

Overview

We are a clinical-stage biopharmaceutical company developing a new class of immunotherapeutics based on our proprietary arenavirus platform that is designed to target and amplify T cell and immune responses to fight diseases. Our replicating and non-replicating technologies are engineered to induce robust and durable antigen-specific CD8+ T cell responses and pathogen-neutralizing antibodies. We believe that our technologies can meaningfully leverage the human immune system for prophylactic and therapeutic purposes by inducing CD8+ T cell response levels previously not achieved by other immune therapy approaches.

We are building a proprietary immuno-oncology pipeline utilizing our replicating technology. Our oncology portfolio targets oncoviral cancer antigens and next-generation antigens and includes two primary programs in development: eseba-vec (formerly HB-200) and HB-700. Eseba-vec is in clinical development for the treatment of Human Papillomavirus 16-positive ("HPV16+") head and neck cancers in a Phase 1/2 clinical trial. Eseba-vec in combination with pembrolizumab received Fast Track Designation from the U.S. Food and Drug Administration ("FDA") in January 2022 and PRIME designation from the European Medicines Agency in April 2024 for the treatment of first-line HPV16+ recurrent/metastatic oropharyngeal squamous cell carcinoma. In April 2024, we received Investigational New Drug ("IND") clearance from the FDA for HB-700 for the treatment of KRAS mutated cancers, including, lung, colorectal and pancreatic cancers.

Our strategic priority is the development of our oncology portfolio, most importantly the advancement of our Eseba-vec program, and we expect to initiate the AVALON-1 trial, a randomized Phase 2/3 trial of eseba-vec, in the fourth quarter of 2024. Additionally, we are developing infectious disease therapies in partnership with other companies. Our Hepatitis B ("HBV") program, HB-400, and our Human Immunodeficiency Virus ("HIV") program, HB-500, are developed in a partnership with Gilead Sciences Inc. ("Gilead").

Eseba-vec, our first program in oncology, is being evaluated in an ongoing Phase 1/2 clinical trial for the treatment of HPV16+ cancers. This trial is currently enrolling participants in Phase 2, evaluating eseba-vec therapy in combination with pembrolizumab in the first line setting of HPV16+ PD-L1+ oropharynx cancer. Preliminary Phase 2 data presented in June 2024 for 35 evaluable patients treated with the combination showed a 37% confirmed objective response rate ("ORR"), 11% complete response ("CR") rate, and disease control rate ("DCR") of 69% per RECIST 1.1 criteria, compared to the historical 19% ORR for pembrolizumab alone. In a subset of 17 evaluable patients with CPS of 20 or higher, the data showed a 53% confirmed ORR, 18% CR rate, and 82% DCR. These patients are representative of the Company's planned AVALON-1 pivotal Phase 2/3 trial population. Additionally, preliminary PFS for the CPS 20 or higher subgroup was 16.3 months and is encouraging based on the historical PFS data of 3.4 months reported for pembrolizumab alone. The preliminary OS rate was 88% at 9 months, and median OS was unreached as of the cutoff date with 16 of 19 patients still alive. Median follow-up for these patients was 8.4 months. Eseba-vec + pembrolizumab was generally well tolerated. Among the 46 participants treated with the combination, Grade ≥3 treatment-related adverse events ("TRAEs") were reported in 7 (15%) patients, serious TRAEs in 2 (4%) patients, and TRAEs leading to treatment discontinuation of eseba-vec in 2 (4%) patients. No treatment-related deaths were reported.

HB-700 was designed for treatment of cancers encoding mutated KRAS, especially KRAS-mutated pancreatic, colorectal, and lung cancers. By simultaneously targeting the five most common mutations, we believe HB-700 has the potential to benefit more patients than single mutation inhibitors. The IND application for HB-700 was cleared by the FDA in April 2024.

In October 2022, we entered into a Research Collaboration and License Agreement (the "Roche Collaboration Agreement"), with Roche to (i) grant Roche an exclusive license to research, develop, manufacture and commercialize our pre-clinical HB-700 cancer program, an arenaviral immunotherapeutic for KRAS-mutated cancers, and (ii) grant Roche an option right to exclusively license for research, development manufacturing and commercialization, a second, novel arenaviral immunotherapeutic program targeting undisclosed cancer antigens. We announced in January 2024 that we received notification from Roche of their decision to terminate the collaboration and licensing agreement for our HB-700 program in KRAS mutated cancers. We have met all go-forward criteria under the agreement. Effective April 25, 2024, we regained full control of the associated intellectual property portfolio and have full collaboration and licensing rights for this program. Pursuant to the Roche Collaboration Agreement, we received a non-refundable upfront payment of $25.0 million, and milestone payments of $20.0 million.

We are collaborating with Gilead Sciences, Inc. ("Gilead") to research arenavirus functional cures for chronic Hepatitis B and HIV infections under a Collaboration and License Agreement signed in 2018 (the "Gilead Collaboration Agreement"). Both programs have completed preclinical research, and in April 2023 the first participant in a Phase 1 clinical trial of the Hepatitis B product candidate being conducted by Gilead has been dosed. Gilead is solely responsible for further development and commercialization of the Hepatitis B product candidate and we are eligible for up to a further $185.0 million in development and commercialization milestone payments, plus tiered royalties. According to the amendment to the Gilead Collaboration Agreement, signed in February 2022, we have taken on development responsibilities for the HIV program candidate through a Phase 1b clinical trial and Gilead will provide funding through a combination of an initiation payment of $15.0 million, a milestone payment of $5.0 million and equity contributions of up to $35.0 million. In November 2023, we received FDA clearance of our IND application for HB-500 and started the Phase 1b trial in the second quarter of 2024. The first person was dosed on July 1, 2024, resulting in the achievement of a $5.0 million non-dilutive milestone payment which was received on July 25, 2024. Gilead retains the exclusive option, to further develop and commercialize the HIV program, in which case we are eligible for up to a further $227.5 million in developmental and commercialization milestone payments, inclusive of a $10.0 million option exercise payment, plus tiered royalties.

On January 29, 2024, we announced our decision to prioritize the clinical development of our eseba-vec program for the treatment of HPV16+ head and neck cancers and our two Gilead-partnered infectious disease programs and to pause development activities related to HB-300, targeting self-antigens for the treatment of prostate cancer, and most of our preclinical research activities. In connection with this strategic refocus, our Board of Directors approved a plan to reduce our workforce by 55 fulltime employees, or approximately 30% of the then-current employee base, and to rebalance our cost structure in alignment with the new prioritization of research and development programs. The prioritization of our eseba-vec program and our two Gilead-partnered programs also included the discontinuation of our GMP manufacturing facility project. The restructuring was completed by the end of the second quarter of 2024.

We have funded our operations to date primarily from public offerings of common stock and convertible preferred stock, including our initial public offering, as well as private placements of our redeemable convertible preferred stock, grant funding and loans from an Austrian government agency, and upfront, milestone and initiation payments from Gilead and Roche in connection with our respective collaboration and license agreements. As of June 30, 2024 we had cash, cash equivalents and restricted cash of $77.4 million.

We do not expect to generate revenue from any product candidates that we develop until we obtain regulatory approval for one or more of such product candidates, if at all, and commercialize our products or enter into additional collaboration agreements with third parties. Substantially all of our net losses have resulted from costs incurred in connection with our research and development programs and from general and administrative costs associated with our operations.

All of our product candidates, including our most advanced oncology product candidate, eseba-vec, will require substantial additional development time and resources before we would be able to apply for and receive regulatory approvals and begin generating revenue from product sales. Before launching our first products, if approved, we plan to establish our own manufacturing facility to reduce or eliminate our reliance on contract manufacturing organizations ("CMOs") which will require substantial capital expenditures and cause additional operating expenses. We currently have no marketing and sales organization and have no experience in marketing products; accordingly, we will incur

significant expenses to develop a marketing organization and sales force in advance of generating any commercial product sales. As a result, we will need substantial additional capital to support our operating activities. In addition, we expect to continue to incur legal, accounting and other expenses in operating our business, including the costs associated with operating as a public company.

We currently anticipate that we will seek to fund our operations through equity or debt financings or other sources, such as government grants and additional collaboration agreements with third parties. Adequate funding may not be available to us on acceptable terms, or at all. If sufficient funds on acceptable terms are not available when needed, we will be required to significantly reduce our operating expenses and delay, reduce the scope of, or eliminate one or more of our development programs.

Since our inception, we have incurred recurring losses, including net losses of $19.1 million and $4.7 million for the three and six months ended June 30, 2024. As of June 30, 2024, we had an accumulated deficit of $374.0 million and we do not expect positive cash flows from operations in the foreseeable future, if ever. We expect to continue to incur net operating losses for at least the next several years as we advance our product candidates through clinical development, seek regulatory approval, prepare for and, if approved, proceed to commercialization, continue our research and development efforts and invest to establish further commercial manufacturing capacity.

Impacts of Market Conditions on Our Business

Unfavorable conditions in the economy in the United States, Austria and elsewhere may negatively affect the growth of our business and our results of operations. Macroeconomic events and conditions such as heightened inflation, increased interest rates, disruptions to global financial markets or a recession or other market correction, including as a result of the ongoing military conflict between Russia and Ukraine and the related sanctions imposed against Russia, any escalation of the conflict in Israel and the Gaza Strip, and other global macroeconomic factors, could reduce our ability to access capital, which could materially impact our business and the value of our common stock.

Components of Our Results of Operations

Revenue from collaboration and licensing

To date, we have not generated any revenue from product sales and do not expect to do so in the near future, if at all. All of our revenue to date has been derived from research collaboration and license agreements with Gilead and Roche.

Gilead Collaboration Agreement

On June 4, 2018, we entered into the Gilead Collaboration Agreement to evaluate potential vaccine products using or incorporating our replicating technology and non-replicating technology for the treatment, cure, diagnosis or prevention of HBV and HIV.

Under the Gilead Collaboration Agreement, we granted Gilead an exclusive, royalty-bearing license to our technology platform for researching, developing, manufacturing and commercializing products for HIV or HBV. We received a non-refundable $10.0 million upfront payment upon entering the Gilead Collaboration Agreement. In February 2022, we signed an amended and restated collaboration agreement (the "Restated Gilead Collaboration Agreement") which revised the terms only for the HIV program, whereby we will take on development responsibilities for the HIV program candidate through a Phase 1b clinical trial. Pursuant to the Restated Gilead Collaboration Agreement, Gilead will retain an exclusive right, the Option, to take back the development responsibilities, thus keeping the rights for the HIV program, including further development and commercialization in return for an option exercise payment of $10.0 million. Pursuant to the Restated Gilead Collaboration Agreement, we are eligible for up to $140.0 million in developmental milestone payments for the HBV program and $50.0 million in commercialization milestone payments. If Gilead exercises the Option, we are eligible for up to $172.5 million in developmental milestone payments for the HIV program, inclusive of the $10.0 million Option exercise payment, and $65.0 million in commercialization milestone payments for the HIV program. Upon the commercialization of a product, we are eligible

to receive tiered royalties of a high single-digit to mid-teens percentage on the worldwide net sales of each HBV product, and royalties of a mid-single-digit to 10% of worldwide net sales of each HIV product. Gilead is obligated to reimburse us for our costs, including all benefits, travel, overhead, and any other expenses, relating to performing research and development activities under the Restated Gilead Collaboration Agreement with respect to the HBV program, and if the Option is exercised, any manufacturing costs related to the HIV program. Through June 30, 2024, we have received a non-refundable upfront payment of $10.0 million, a program initiation fee of $15.0 million and $21.2 million in milestone payments for the achievement of pre-clinical research milestones from Gilead. On July 1, 2024 the first person was dosed in a Phase 1b clinical trial of HB-500 resulting in the achievement of a $5.0 million non-dilutive milestone payment which was received on July 25, 2024. In addition, we have recognized $42.4 million of cost reimbursements for research and development services performed under the Restated Gilead Collaboration Agreement.

We determined that our performance obligations under the terms of the original Gilead Collaboration Agreement included one combined performance obligation for each of the HBV and HIV research programs, comprised of the transfer of intellectual property rights and providing research and development services. Accordingly, we recognized these amounts as revenue over the performance period of the respective services on a percent of completion basis using total estimated research and development labor hours for each of the performance obligations. The terms of the Restated Gilead Collaboration Agreement added an additional performance obligation to us to perform research and development work for the HIV program. We recognize the amounts of revenue allocated to the performance obligation resulting from the Restated Gilead Collaboration Agreement on a percent of completion basis over the performance period, using total estimated research and development costs as the measure of progress.

Roche Collaboration Agreement

On October 18, 2022, we entered into the Roche Collaboration Agreement to (i) grant Roche an exclusive license to research, develop, manufacture and commercialize our pre-clinical HB-700 cancer program, an arenaviral immunotherapeutic for KRAS-mutated cancers, and (ii) grant Roche an exclusive option right to exclusively license for research, development manufacturing and commercialization, a second, novel arenaviral immunotherapeutic program targeting undisclosed cancer antigens. In January 2024, Roche provided us with written notice of the termination of the collaboration and licensing agreement.

Under the terms of the terminated Roche Collaboration Agreement, we granted Roche an exclusive, royalty-bearing license to our technology platforms for KRAS-mutated cancers, and an option right to exclusively license a second, novel arenaviral immunotherapeutic program targeting undisclosed cancer antigens. Pursuant to the terms of the Roche Collaboration Agreement, following the termination notice, the Roche Collaboration Agreement was terminated on April 25, 2024. Effective April 25, 2024, we regained full control of the associated intellectual property portfolio and have full collaboration and licensing rights for the KRAS program.

Through June 30, 2024, we have received from Roche the non-refundable upfront payment of $25.0 million, $10.0 million in milestone payments for the achievement of a GMP manufacturing milestone under the HB-700 program and $10.0 million in milestone payments associated with an IND submission for the HB-700 program. In addition, we have recognized $0.6 million of cost reimbursements for research and development activities related to a first human trial.

We determined that our performance obligations under the terms of the Roche Collaboration Agreement included one combined performance obligation for the transfer of intellectual property rights (licenses) and providing research and development services for the HB-700 program, and a second, separate performance obligation during the UCA Option period to perform research and development services with respect to the UCA Program. Accordingly, we allocated the non-refundable upfront payment of $25.0 million between the two performance obligations. Milestone payments that were contingent on future events were added to the transaction price when the triggering event became probable. The consideration allocated to a performance obligation has been recognized as revenue over the performance period of the respective services on a percent of completion basis using total estimated research and development costs for each of the performance obligations. Milestone payments, or parts thereof, that related to completed services were reflected via a cumulative catch up for past performance.

Operating Expenses

Our operating expenses since inception have only consisted of research and development costs, general and administrative costs and restructuring and impairment expenses.

Research and Development Expenses

Since our inception, we have focused significant resources on our research and development activities, including establishing our arenavirus platform, conducting preclinical studies, developing a manufacturing process, conducting Phase 1 and Phase 2 clinical trials, including the ongoing eseba-vec (formerly HB-200) Phase 1/2 trial, and progressing IND applications, including for HB-500 and HB-700. Research and development activities account for a significant portion of our operating expenses. Research and development costs are expensed as incurred. These costs include:

- salaries, benefits and other related costs, including stock-based compensation, for personnel engaged in research and development functions;
- expenses incurred in connection with the preclinical development of our programs and clinical trials of our product candidates, including under agreements with third parties, such as consultants, contractors, academic institutions and contract research organizations ("CROs");
- the cost of manufacturing drug products for use in clinical trials, including under agreements with third parties, such as CMOs, consultants and contractors;
- laboratory costs;
- leased facility costs, equipment depreciation and other expenses, which include direct and allocated expenses; and
- third-party license fees.

The majority of our research and development costs are external costs, which we track on a program-by-program basis. We do not track our internal research and development expenses on a program-by-program basis as they primarily relate to shared costs deployed across multiple projects under development.

We expect our research and development expenses to increase substantially in the future as we advance our existing and future product candidates into and through clinical trials and pursue regulatory approval. The process of conducting the necessary clinical studies to obtain regulatory approval is costly and time-consuming. Clinical trials generally become larger and more costly to conduct as they advance into later stages and, in the future, we will be required to make estimates for expense accruals related to clinical trial expenses.

At this time, we cannot reasonably estimate or know the nature, timing and estimated costs of the efforts that will be necessary to complete the development of any product candidates that we develop from our programs. We are also unable to predict when, if ever, material net cash inflows will commence from sales of product candidates we develop, if at all. This is due to the numerous risks and uncertainties associated with developing product candidates, including the uncertainty of:

- successful completion of preclinical studies and clinical trials;
- sufficiency of our financial and other resources to complete the necessary preclinical studies and clinical trials;
- substantial doubt regarding our ability to continue as a going concern;

- acceptance of INDs for our planned clinical trials or future clinical trials;
- successful enrollment and completion of clinical trials;
- successful data from our clinical program that support an acceptable risk-benefit profile of our product candidates in the intended populations;
- receipt and maintenance of regulatory and marketing approvals from applicable regulatory authorities;
- scaleup of our manufacturing processes and formulation of our product candidates for later stages of development and commercialization;
- establishing our own manufacturing capabilities or agreements with third-party manufacturers for clinical supply for our clinical trials and commercial manufacturing, if our product candidate is approved;
- entry into collaborations to further the development of our product candidates;
- obtaining and maintaining patent and trade secret protection or regulatory exclusivity for our product candidates;
- successfully launching commercial sales of our product candidates, if approved;
- acceptance of the product candidates benefits and uses, if approved, by patients, the medical community and third-party payors;
- the prevalence and severity of adverse events experienced with our product candidates;
- maintaining a continued acceptable safety profile of the product candidates following approval;
- effectively competing with other therapies;
- obtaining and maintaining healthcare coverage and adequate reimbursement from third-party payors; and
- qualifying for, maintaining, enforcing and defending intellectual property rights and claims.

A change in the outcome of any of these variables with respect to the development of a product candidate could mean a significant change in the costs and timing associated with the development of that product candidate. For example, if the FDA or another regulatory authority were to require us to conduct clinical trials beyond those that we anticipate will be required for the completion of clinical development of a product candidate, or if we experience significant delays in our clinical trials due to patient enrollment or other reasons, we would be required to expend significant additional financial resources and time on the completion of clinical development.

The following table summarizes our research and development expenses by product candidate or program (in thousands):

	Three months ended June 30,		Six months ended June 30,	
	2024	2023	2024	2023
Eseba-vec (formerly HB-200) program	$ 16,939	$ 10,715	$ 29,389	$ 20,448
HB-300 program	286	1,690	1,911	5,337
Gilead partnered programs	1,237	4,071	2,849	7,655
Roche partnered programs	844	1,332	4,893	3,325
Other and earlier-stage programs	141	1,531	524	3,093
Other unallocated research and development expenses	302	367	351	779
Total research and development expenses	$ 19,749	$ 19,706	$ 39,917	$ 40,637

Other unallocated research and development expenses include stock-based compensation expense, certain lease expenses and other operating expenses that we do not track on a program-by-program basis, since our research and development employees and infrastructure resources are utilized across our programs.

General and Administrative Expenses

Our general and administrative expenses consist primarily of personnel costs in our executive, finance and investor relations, business development and administrative functions. Other general and administrative expenses include consulting fees and professional service fees for auditing, tax and legal services, lease expenses related to our offices, premiums for directors and officers liability insurance, intellectual property costs incurred in connection with filing and prosecuting patent applications, depreciation and other costs. We expect our general and administrative expenses to continue to increase in the future as we expand our operating activities and prepare for potential commercialization of our current and future product candidates, increase our headcount and investor relations activities and maintain compliance with requirements of the Nasdaq Capital Market and the Securities and Exchange Commission.

Restructuring Expenses

Restructuring expenses consist of severance and other personnel costs and professional services and consulting costs associated with exit and disposal activities.

Grant Income

Since inception, we have received grants from the Austrian Research Promotions Agency, either under funding agreements or under research incentive programs. In addition, we have received loans under funding agreements that bear interest at below market interest rate. We account for the grants received as other income and for the imputed benefits arising from the difference between a market rate of interest and the rate of interest as additional grant income, and record interest expense for the loans at a market rate of interest.

We participate in a research incentive program provided by the Austrian government under which we are entitled to reimbursement of a percentage of qualifying research and development expenses and capital expenditures incurred in Austria. Submissions for reimbursement under the program are submitted annually. Incentive amounts are generally paid out during the calendar year that follows the year of the expenses but remain subject to subsequent examinations by the responsible authority.

Furthermore, we participated in the life sciences research and development program provided by the New York State government under which we were entitled to reimbursement of a percentage of qualifying research and development expenses in New York State up to $0.5 million per year for the years 2019 to 2021. Submissions for reimbursement under the program were submitted in the fourth quarter of 2023 and certificates of tax credits were received. Incentive amounts are generally paid out six to nine months after amended tax returns including a certificate of tax credit issued by Empire State Development are filed. We account for the grants received as other income.

We also participate in the New York City biotechnology tax credit program, according to which certain expenses for business in the biotechnology field in New York City limited to $0.25 million per year for three consecutive years from January 1, 2023 to December 31, 2025 are incentivized. We account for the grants received as other income.

Interest Income

Interest income results of interest earned on our cash, cash equivalents, and restricted cash.

Interest Expense

Interest expense results primarily from loans under funding agreements with the Austrian Research Promotion Agency, recorded at a market rate of interest. The difference between interest payments payable pursuant to the loans, which rates are at below market interest rates, and the market interest rate, is accounted for as grant income.

Income Taxes

Income tax expense results from U.S. federal and state income tax as well as foreign minimum income tax and profit on a legal entity basis. The losses that we have incurred since inception result primary from the losses of our Austrian subsidiary. We have considered that, at this point in time, it is uncertain whether we will ever be able to realize the benefits of the deferred tax asset, and accordingly, have established a full valuation allowance as of June 30, 2024.

Results of Operations

Comparison of the Three and Six Months Ended June 30, 2024 and 2023

The following table summarizes our results of operations for the three and six months ended June 30, 2024 and 2023 (in thousands):

	Three months ended June 30,			Six months ended June 30,		
	2024	2023	Change	2024	2023	Change
Revenue from collaboration and licensing	$ 1,290	$ 2,679	$ (1,389)	$ 37,889	$ 5,855	$ 32,034
Operating expenses:						
Research and development	(19,749)	(19,706)	(43)	(39,917)	(40,637)	720
General and administrative	(3,945)	(4,445)	500	(8,001)	(9,347)	1,346
Restructuring	(54)	—	(54)	(1,323)	—	(1,323)
Total operating expenses	(23,748)	(24,151)	403	(49,241)	(49,984)	743
Loss from operations	(22,458)	(21,472)	(986)	(11,352)	(44,129)	32,777
Other income:						
Grant income	2,508	2,217	291	4,741	4,570	171
Interest income	1,073	1,311	(238)	2,404	2,482	(78)
Interest expense	—	(97)	97	(2)	(219)	217
Other (expense) income, net	(218)	25	(243)	(503)	(195)	(308)
Total other income, net	3,363	3,456	(93)	6,640	6,638	2
Net loss before tax	(19,095)	(18,016)	(1,079)	(4,712)	(37,491)	32,779
Income tax expense	(0)	(0)	(0)	(0)	(205)	205
Net loss	$ (19,095)	$ (18,016)	$ (1,079)	$ (4,712)	$ (37,696)	$ 32,984

Revenue from Collaboration and Licensing

Revenue was $1.3 million and $37.9 million for the three and six months ended June 30, 2024, respectively, compared to $2.7 million and $5.9 million for the three and six months ended June 30, 2023, respectively.

During the three months ended June 30, 2024, revenue decreased by $1.4 million compared to the three months ended June 30, 2023. This decrease was primarily due to lower partial recognition of the upfront and milestone payments under the Roche Collaboration Agreement as a result of the termination of the Roche Collaboration Agreement.

For the three months ended June 30, 2024 and 2023, revenue included $0.1 million and $0.3 million, respectively, from reimbursement of research and development expenses, and $1.2 million and $2.4 million, respectively, from partial recognition of upfront, milestone and initiation payments that were initially recorded as deferred revenue.

For the three months ended June 30, 2024, revenue included $0.6 million related to the Restated Gilead Collaboration Agreement, of which $0.1 million resulted from reimbursement of research and development expenses and $0.5 million resulted from partial recognition of milestone and initiation payments that were initially recorded as deferred revenue. In addition, revenue included $0.7 million related to the terminated Roche Collaboration Agreement, of which less than $0.1 million resulted from reimbursement of expenses and $0.7 million from partial recognition of upfront and milestone payments under the terminated Roche Collaboration Agreement, that were initially recorded as deferred revenue.

For the three months ended June 30, 2023, revenue included $1.7 million related to the Restated Gilead Collaboration Agreement, of which $0.3 million resulted from reimbursement of research and development expenses and $1.4 million from partial recognition of milestone and initiation payments that were initially recorded as deferred revenue. In addition, revenue included $1.0 million from partial recognition of upfront and milestone payments under the terminated Roche Collaboration Agreement that were initially recorded as deferred revenue.

During the six months ended June 30, 2024, revenue increased by $32.0 million compared to the six months ended June 30, 2023. This increase was primarily due to higher partial recognition of the upfront and milestone payments under the Roche Collaboration as a result of the termination of the Roche Collaboration Agreement leading to accelerated recognition of the upfront and milestone payments that were initially recorded as deferred revenue, including the partial recognition of revenue from a $10.0 million milestone achieved in March 2024.

For the six months ended June 30, 2024 and 2023, revenue included $0.3 million and $0.8 million, respectively, from reimbursement of research and development expenses, and $37.6 million and $5.1 million, respectively, from partial recognition of upfront, milestone and initiation payments that were initially recorded as deferred revenue.

For the six months ended June 30, 2024, revenue included $1.5 million related to the Restated Gilead Collaboration Agreement, of which $0.2 million resulted from reimbursement of research and development expenses and $1.3 million resulted from partial recognition of milestone and initiation payments that were initially recorded as deferred revenue. In addition, revenue included $36.4 million related to the terminated Roche Collaboration Agreement, of which $0.1 million resulted from reimbursement of expenses and $36.3 million of revenue recognized. Revenue recognized includes $26.3 million of the upfront and milestone payments that were originally recorded as deferred revenue and $10.0 million related to milestone achieved in March 2024 and received in April 2024 associated with an IND submission for the HB-700 program.

For the six months ended June 30, 2023, revenue included $3.4 million related to the Restated Gilead Collaboration Agreement, of which $0.8 million resulted from reimbursement of research and development expenses and $2.6 million from partial recognition of milestone and initiation payments that were initially recorded as deferred revenue. In addition, revenue included $2.5 million from partial recognition of upfront and milestone payments under the terminated Roche Collaboration Agreement that were initially recorded as deferred revenue.

Research and Development Expenses

For the three and six months ended June 30, 2024, our research and development expenses were $19.7 million and $39.9 million, respectively, compared to $19.7 million and $40.6 million for the three and six months ended June 30, 2023, respectively.

The research and development expenses for the three months ended June 30, 2024 compared to the three months ended June 30, 2023 remained unchanged. Indirect research and development expenses decreased by $2.2 million, offset by an increase in direct research and development expenses of $2.2 million. Indirect research and development expenses decreased mainly because of lower personnel-related expenses of $1.7 million and lower expenses for laboratory consumables of $0.4 million. The decrease in personnel-related expenses mainly resulted from the effects of our workforce reduction, including the effects of stock option forfeitures. The increase in direct research and development expenses was primarily driven by higher clinical study expenses for our eseba-vec program, partially offset by lower manufacturing expenses and decreased spending for our other programs.

The decrease of $0.7 million for the six months ended June 30, 2024 compared to the six months ended June 30, 2023 was attributable to a decrease in indirect research and development expenses of $3.4 million, partially offset by an increase in direct research and development expenses of $2.7 million. Indirect research and development expenses decreased mainly because of lower personnel-related expenses of $2.2 million, lower expenses for laboratory consumables of $0.8 million and lower travel expenses of $0.3 million. The decrease in personnel-related expenses mainly resulted from the effects of our workforce reduction, including the effects of stock option forfeitures. The increase in direct research and development expenses was primarily driven by higher clinical study expenses for our eseba-vec program, as well as amortization expenses related to capitalized sublicense payments following the termination of the Roche Collaboration, partially offset by lower manufacturing expenses and decreased spending for our other programs.

General and Administrative Expenses

General and administrative expenses for the three and six months ended June 30, 2024 were $3.9 million and $8.0 million, respectively, compared to $4.4 million and $9.3 million for the three and months ended June 30, 2023, respectively.

The decrease of $0.5 million for the three months ended June 30, 2024 compared to the three months ended June 30, 2023 was primarily due to a decrease in professional and consulting fees of $0.3 million and a decrease in personnel-related expenses of $0.2 million. The decrease in personnel-related expenses resulted primarily from lower stock-based compensation expense of $0.1 million and lower training and recruitment fees of $0.1 million.

The decrease of $1.3 million for the six months ended June 30, 2024 compared to the six months ended June 30, 2023 was primarily due to a decrease in personnel-related expenses of $0.8 million, a decrease in other expenses of $0.3 million, and a decrease in professional and consulting fees of $0.2 million. The decrease in personnel-related expenses resulted primarily from lower stock-based compensation expense of $0.6 million and lower training and recruitment fees of $0.2 million.

Restructuring Expenses

Restructuring expenses for the three and six months ended June 30, 2024 were $0.1 million and $1.3 million, respectively.

Restructuring expenses for the three months ended June 30, 2024 consisted of less than $0.1 million of severance and other personnel costs and less than $0.1 million of professional fees and consulting costs associated with exit and disposal activities. There were no restructuring expenses for the three months ended June 30, 2023.

Restructuring expenses for the six months ended June 30, 2024 consisted of $1.2 million of severance and other personnel costs and $0.1 million of professional fees and consulting costs associated with exit and disposal activities. There were no restructuring expenses for the six months ended June 30, 2023.

Grant Income

In the three months ended June 30, 2024, we recorded grant income of $2.5 million, compared to $2.2 million in the three months ended June 30, 2023. Income from grants mainly included research incentives and imputed benefits

from below market interest rates on loans from governmental agencies. The increase of $0.3 million was primarily due to higher income from Austrian research and development incentives as a result of higher eligible research and development expenses, partially offset by lower imputed benefits associated with the FFG Loans.

In the six months ended June 30, 2024, we recorded grant income of $4.7 million, compared to $4.6 million in the six months ended June 30, 2023. Income from grants mainly included research incentives and imputed benefits from below market interest rates on loans from governmental agencies. The increase of $0.1 million was primarily due to higher income from Austrian research and development incentives as a result of higher eligible research and development expenses, partially offset by lower imputed benefits associated with the FFG Loans.

Interest Income and Expense

Interest income was $1.1 million and $2.4 million for the three and six months ended June 30, 2024, respectively, compared to interest income of $1.3 million and $2.5 million for the three and six months ended June 30, 2023, respectively. The decrease in interest income for the three and six months ended June 30, 2024 was a result of a lower cash position, partially offset by rising U.S. dollar and euro interest rates. Interest income represents interest from cash and cash equivalents held in U.S. dollars and euros resulting from the proceeds from the issuance of common and preferred stock as well as payments received under our Gilead and Roche collaborations. During the three and six months ended June 30, 2024 our cash, cash equivalents and restricted cash were mainly held in dollars at U.S. investment grade financial institutions or in money market funds. In addition, smaller amounts were held in euros and dollars at our Austrian subsidiary.

No interest expenses were recorded for the three months ended June 30, 2024, compared to interest expenses for loans from government agencies of $0.1 million for the three months ended June 30, 2023. Interest expenses for loans from government agencies were less than $0.1 million for the six months ended June 30, 2024, compared to $0.2 million for the six months ended June 30, 2023. Interest expense was recorded at the market rate of interest, which exceeded the contractual interest rate. The decrease of interest expenses was primarily due to the final principal repayment related to the FFG Loans.

Other Income and Expenses

Other expenses were $0.2 million for the three months ended June 30, 2024, compared to other income of less than $0.1 million for the three months ended June 30, 2023. The change in the three months ended June 30, 2024 resulted primarily from exchange rate differences and foreign currency remeasurements.

Other expenses were $0.5 million and $0.2 million for the six months ended June 30, 2024 and June 30, 2023, respectively. The change in the six months ended June 30, 2024 resulted primarily from exchange rate differences and foreign currency remeasurements.

Liquidity and Capital Resources

Since our inception in 2011, we have funded our operations primarily from public offerings and private placements of common stock and convertible preferred stock, including our initial public offering, as well as private placements of our redeemable convertible preferred stock, grant funding and loans from an Austrian government agency, and upfront, milestone and initiation payments from Gilead and Roche in connection with research collaboration agreements.

Prior to our IPO, we raised gross proceeds of approximately $142.5 million from the issuance of our redeemable convertible preferred stock. In April 2019, we completed our IPO in which we issued and sold 600,000 (6,000,000 before the Reverse Stock Split) shares of our common stock, at $140.00 per share, for gross proceeds of $84.0 million, or net proceeds of $74.6 million. In December 2020, we completed a follow-on public offering in which we issued 391,000 (3,910,000 before the Reverse Stock Split) shares of our common stock, at $117.50 per share, and 2,978 shares of our Series A convertible preferred stock, at $11,750.00 per share, for net proceeds of $75.0 million after deducting underwriting discounts and commissions and offering expenses. In March 2022, we completed a follow-on

public offering in which we issued 2,170,000 (21,700,000 before the Reverse Stock Split) shares of our common stock, at $20.00 per share, and 15,800 shares of our Series A-1 convertible preferred stock, at $2,000.00 per share, for net proceeds of $70.2 million after deducting underwriting discounts and commissions and offering expenses. In June 2023, we completed a follow-on public offering in which we issued 2,290,077 (22,900,768 before the Reverse Stock Split) shares of our common stock, at $13.10 per share, and 15,268 shares of our Series A-2 convertible preferred stock, at $1,310.00 per share, for net proceeds of $46.2 million after deducting underwriting discounts and commissions and offering expenses. In addition, in February 2022, Gilead purchased 166,666 (1,666,666 before the Reverse Stock Split) shares of our common stock for $5.0 million, at a purchase price of $30.00 per share, and in December 2023, Gilead purchased 1,500,000 (15,000,000 before the Reverse Stock Split) shares of our common stock, at $14.167 per share, for net proceeds of approximately $21.1 million after deducting offering expenses. Pursuant to the terms of the Amended Stock Purchase Agreement, we may require Gilead to purchase the balance of the $8.75 million of common stock as pro-rata participation in potential future equity raises (see "Note 10. Common stock, Class A common stock and convertible preferred stock" to our consolidated financial statements appearing elsewhere in this Quarterly Report). We also received $46.2 million from non-refundable upfront, milestone and initiation payments pursuant to the Restated Gilead Collaboration Agreement and $45.0 million from non-refundable upfront and milestone payments related to the Roche Collaboration Agreement. In addition, we achieved a $5.0 million milestone payment in July 2024 which was received on July 25, 2024 pursuant to the Restated Gilead Collaboration Agreement. As of June 30, 2024, we had cash, cash equivalents and restricted cash of $77.4 million.

On July 12, 2022, we filed a registration statement on Form S-3 (the "Registration Statement"), with the SEC, which was declared effective on July 21, 2022. The Registration Statement registers the offering, issuance and sale of an unspecified amount of common stock, preferred stock, debt securities, warrants and/or units of any combination thereof. We simultaneously entered into a Sales Agreement with Leerink Partners LLC ("Leerink"), as sales agent, to provide for the issuance and sale by us of up to $50.0 million of common stock from time to time in "at-the-market" offerings under the Registration Statement and related prospectus filed with the Registration Statement ("Leerink ATM Program"). As of June 30, 2024, no sales had been made pursuant to the Leerink ATM Program. On August 5, 2024, we delivered a termination notice to Leerink to terminate the Sales Agreement, effective as of August 8, 2024. At the time of termination, $50.0 million remained available for issuance pursuant to the Sales Agreement. On August 8, 2024, we entered into an Open Market Sale Agreement℠ with Jefferies LLC, as sales agent, to provide for the issuance and sale by us of up to $50.0 million of common stock from time to time in "at-the-market" offerings under the Registration Statement and related prospectus filed with the Registration Statement.

We entered into various funding agreements with the Austrian Research Promotion Agency (Österreichische Forschungsförderungsgesellschaft, or "FFG"). The loans by FFG (the "FFG Loans") were made on a project-by-project basis and bear interest at a rate of 0.75% per annum. In the event that the underlying program research results in a scientific or technical failure, the principal then outstanding under any loan may be forgiven by FFG and converted to non-repayable grant funding on a project-by-project basis. The FFG Loans contained no financial covenants and were not secured by any of our assets. As of June 30, 2024, there is no remaining debt obligation under the FFG loan following the final principal repayment in April 2024.

Because the FFG Loans bear interest at below market rates we account for the imputed benefit arising from the difference between an estimated market rate of interest and the contractual interest rate as grant funding from FFG, which is included in grant income. On the date that FFG Loan proceeds are received, we recognize the portion of the loan proceeds allocated to grant funding as a discount to the carrying value of the loan and as unearned income. As of June 30, 2024, the unamortized debt discount related to FFG Loans was zero due to the final maturity on March 31, 2024 and the final repayment on April 2, 2024.

We have entered into arrangements with contract manufacturing organizations. As of June 30, 2024, we had total non-cancellable obligations under such contracts of $5.2 million.

We do not expect positive cash flows from operations in the foreseeable future, if at all. Historically, we have incurred operating losses as a result of ongoing efforts to develop our arenavirus technology platform and our product candidates, including conducting ongoing research and development, preclinical studies, clinical trials, providing general and administrative support for these operations and developing our intellectual property portfolio. We expect to continue

to incur net operating losses for at least the next several years as we progress clinical development, seek regulatory approval, prepare for and, if approved, proceed to commercialization of our most advanced oncology product candidate eseba-vec, continue our research and development efforts relating to our other and future product candidates, and invest in our manufacturing capabilities and our own manufacturing facility.

Going Concern

We evaluated whether there are conditions and events, considered in the aggregate, that raise substantial doubt about our ability to continue as a going concern within one year after the date that the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q are issued. This evaluation initially does not take into consideration the potential mitigating effect of management's plans that have not been fully implemented as of the date the financial statements are issued. When substantial doubt exists under this methodology, management evaluates whether the mitigating effect of its plans sufficiently alleviates substantial doubt about our ability to continue as a going concern. The mitigating effect of management's plans, however, is only considered if both (1) it is probable that the plans will be effectively implemented within one year after the date that the condensed consolidated financial statements are issued, and (2) it is probable that the plans, when implemented, will mitigate the relevant conditions or events that raise substantial doubt about our ability to continue as a going concern within one year after the date that the accompanying condensed consolidated financial statements are issued. In performing its analysis, management excluded certain elements of its operating plan that cannot be considered probable. Under ASC 205-40, the future receipt of potential funding from future partnerships, equity or debt issuances, the potential milestones from the Gilead Collaboration Agreement and potential reductions in force cannot be considered probable at this time because these plans are not entirely within our control and/or have not been approved by the Board of Directors as of the date of the accompanying condensed consolidated financial statements.

Our expectation to generate operating losses and negative operating cash flows in the future and the need for additional funding to support our planned operations raise substantial doubt regarding our ability to continue as a going concern for a period of one year after the date that condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q are issued. Management's plans to alleviate the conditions that raise substantial doubt include reduced spending and the pursuit of additional capital. Management has concluded that the likelihood that its plan to successfully obtain sufficient funding, or adequately reduce expenditures, while reasonably possible, is less than probable. Accordingly, we have concluded that substantial doubt exists about our ability to continue as a going concern for a period of at least 12 months from the date of issuance of the accompanying condensed consolidated financial statements.

The accompanying condensed consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and satisfaction of liabilities in the ordinary course of business. The financial statements do not include any adjustments relating to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might result from the outcome of the uncertainties described above.

Future Funding Requirements

We have no products approved for commercial sale. To date, we have devoted substantially all of our resources to organizing and staffing our company, business planning, raising capital, undertaking preclinical studies and clinical trials of our product candidates. As a result, we are not profitable and have incurred losses in each period since our inception in 2011, except for the first quarter of 2024. As of June 30, 2024, we had an accumulated deficit of $374.0 million. We expect to continue to incur significant losses for the foreseeable future. Based on our cash and cash equivalents as of June 30, 2024 and our planned operating expenses and capital expenditure requirements, there is substantial doubt regarding our ability to continue as a going concern for a period of one year after the issuance date of condensed consolidate financial statements accompanying this Quarterly Report on Form 10-Q. We anticipate that our expenses will increase substantially as we:

- pursue the clinical and preclinical development of our current and future product candidates;

- leverage our technologies to advance product candidates into preclinical and clinical development;
- seek regulatory approvals for product candidates that successfully complete clinical trials, if any;
- attract, hire and retain additional clinical, quality control and scientific personnel;
- establish our manufacturing capabilities through third parties or by ourselves and scale-up manufacturing to provide adequate supply for clinical trials and commercialization;
- expand our operational, financial and management systems and increase personnel, including personnel to support our clinical development, manufacturing and commercialization efforts and our operations as a public company;
- expand and protect our intellectual property portfolio;
- establish a sales, marketing, medical affairs and distribution infrastructure to commercialize any products for which we may obtain marketing approval and intend to commercialize on our own or jointly;
- acquire or in-license other product candidates and technologies; and
- incur additional legal, accounting and other expenses in operating our business, including ongoing costs associated with operating as a public company.

Even if we succeed in commercializing one or more of our product candidates, we will continue to incur substantial research and development and other expenditures to develop and market additional product candidates. We may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. The size of our future net losses will depend, in part, on the rate of future growth of our expenses and our ability to generate revenue. Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' equity and working capital.

We will require substantial additional financing and a failure to obtain this necessary capital could force us to delay, limit, reduce or terminate our product development programs, commercialization efforts or other operations.

Since our inception, we have invested a significant portion of our efforts and financial resources in research and development activities for our non-replicating and replicating technologies and our product candidates derived from these technologies. Preclinical studies and clinical trials and additional research and development activities will require substantial funds to complete. We believe that we will continue to expend substantial resources for the foreseeable future in connection with the development of our current product candidates and programs as well as any future product candidates we may choose to pursue, as well as the gradual gaining of control over our required manufacturing capabilities and other corporate uses. These expenditures will include costs associated with conducting preclinical studies and clinical trials, obtaining regulatory approvals, and manufacturing and supply, as well as marketing and selling any products approved for sale. In addition, other unanticipated costs may arise. Because the outcome of any preclinical study or clinical trial is highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of our current or future product candidates.

Our future capital requirements depend on many factors, including:

- the scope, progress, results and costs of researching and developing our current and future product candidates and programs, and of conducting preclinical studies and clinical trials;
- the number and development requirements of other product candidates that we may pursue, and other indications for our current product candidates that we may pursue;

- the stability, scale and yields of our future manufacturing process as we scale-up production and formulation of our product candidates for later stages of development and commercialization;
- the timing of, and the costs involved in, obtaining regulatory and marketing approvals and developing our ability to establish sales and marketing capabilities, if any, for our current and future product candidates we develop if clinical trials are successful;
- the success of our collaboration with Gilead;
- our ability to establish and maintain collaborations, strategic licensing or other arrangements and the financial terms of such agreements;
- the cost of commercialization activities for our current and future product candidates that we may develop, whether alone or with a collaborator;
- the costs involved in preparing, filing, prosecuting, maintaining, expanding, defending and enforcing patent claims, including litigation costs and the outcome of such litigation;
- the timing, receipt and amount of sales of, or royalties on, our future products, if any; and
- the emergence of competing oncology and infectious disease therapies and other adverse market developments.

A change in the outcome of any of these or other variables with respect to the development of any of our current and future product candidates could significantly change the costs and timing associated with the development of that product candidate. Furthermore, our operating plans may change in the future, and we will need additional funds to meet operational needs and capital requirements associated with such operating plans.

We do not have any committed external source of funds or other support for our development efforts. Until we can generate sufficient product and royalty revenue to finance our cash requirements, which we may never do, we expect to finance our future cash needs through a combination of public or private equity offerings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing or distribution arrangements as well as grant funding. Based on our research and development plans, we have concluded that substantial doubt exists that our cash and cash equivalents, including the funds received under the Restated Gilead Collaboration Agreement will enable us to fund our operating expenses and capital expenditure requirements for at least the next 12 months from the issuance date of the condensed consolidated financial statements. These estimates are based on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we expect.

If we raise additional capital through marketing and distribution arrangements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish certain valuable rights to our product candidates, technologies, future revenue streams or research programs or grant licenses on terms that may not be favorable to us. If we raise additional capital through public or private equity offerings, the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights. Further, to the extent that we raise additional capital through the sale of common stock or securities convertible or exchangeable into common stock, the ownership interest of our shareholders will be diluted. If we raise additional capital through debt financing, we would be subject to fixed payment obligations and may be subject to covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we are unable to obtain additional funding on favorable terms when needed, we may have to delay, reduce the scope of or terminate one or more of our research and development programs or clinical trials.

Cash Flows

The following table sets forth a summary of the primary sources and uses of cash (in thousands):

	Six months ended June 30,	
	2024	2023
Net cash used in operating activities	$ (38,532)	$ (22,181)
Net cash used in investing activities	(161)	(719)
Net cash (used in) provided by financing activities	(1,276)	45,080
Net (decrease) increase in cash and cash equivalents	(39,969)	22,180

Cash Used in Operating Activities

During the six months ended June 30, 2024, cash used in operating activities was $38.5 million, which consisted of a net loss of $4.7 million, adjusted by non-cash charges of $1.6 million and cash used due to changes in our operating assets and liabilities of $35.4 million. The non-cash charges consisted primarily of depreciation and amortization expense of $1.4 million and stock-based compensation of $0.2 million. The change in our operating assets and liabilities was primarily due to a decrease in deferred revenues of $26.8 million, primarily resulting from the early-recognition of deferred revenues related to the terminated Roche Collaboration Agreement, an increase in prepaid expenses and other non-current assets of $4.8 million, an increase in receivable research incentives of $4.2 million, a decrease in accounts payable of $1.2 million, a decrease in operating lease liabilities of $0.9 million, and a decrease in accrued expenses and other current liabilities of $0.8 million, partially offset by a decrease in prepaid expenses and other current assets of $2.6 million and a decrease in accounts receivable of $0.7 million.

During the six months ended June 30, 2023, cash used in operating activities was $22.2 million, which consisted of a net loss of $37.7 million, adjusted by non-cash charges of $3.1 million and cash provided due to changes in our operating assets and liabilities of $12.4 million. The non-cash charges consisted primarily of depreciation and amortization expense of $1.8 million and stock-based compensation of $1.4 million. The change in our operating assets and liabilities was primarily due to a decrease in accounts receivable of $6.3 million, primarily resulting from the collection of a $5.0 million milestone payment and cost reimbursements from Gilead, an increase in accounts payable of $5.2 million, an increase in deferred revenues of $4.9 million, resulting from the receipt of a $10.0 million milestone payment less recognition of deferred revenue in the period, an increase in other current liabilities of $0.7 million, a decrease in prepaid expenses and other current assets of $0.4 million, and an increase in other non-current liabilities of $0.2 million, partially offset by an increase in receivable research incentives of $4.4 million, a decrease in operating lease liabilities of $0.8 million, and an increase in other non-current assets of $0.1 million.

Cash Used in Investing Activities

During the six months ended June 30, 2024, cash used in investing activities was $0.2 million. The decrease of $0.5 million compared to the six months ended June 30, 2023 resulted from deceased capital expenditures in connection with our GMP manufacturing facility project and lower expenditures for purchase of equipment.

During the six months ended June 30, 2023, cash used in investing activities was $0.7 million and resulted primarily from capital expenditures in connection with our GMP manufacturing facility project as well as expenditures for laboratory and office space extension and purchase of equipment.

Cash (Used in) Provided by Financing Activities

During the six months ended June 30, 2024, cash used in financing activities was $1.3 million and consisted mainly of a principal repayment of loans of $1.1 million and costs related to Gilead’s purchase of common stock in December 2023.

During the six months ended June 30, 2023, cash provided by financing activities was $45.0 million and consisted mainly of net proceeds of $47.0 million from our follow-on public offering in June 2023, partially offset by principal repayments of loans of $1.8 million.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our condensed consolidated financial statements, which we have prepared in accordance with the rules and regulations of the SEC, and generally accepted accounting principles in the United States ("GAAP"). The preparation of these condensed consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported expenses during the reporting periods. We evaluate our estimates and judgments on an ongoing basis. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Our actual results may differ from these estimates under different assumptions or conditions.

Our critical accounting policies and the methodologies and assumptions we apply under them have not materially changed, as compared to those disclosed in "Management's Discussion and Analysis of Financial Condition and Results of Operations - Critical Accounting Policies" in our Annual Report on Form 10-K for the year ended December 31, 2023 filed with the Securities and Exchange Commission ("SEC") on March 22, 2024.

Recently Issued Accounting Pronouncements

A description of recently issued accounting pronouncements that may potentially impact our financial position and results of operations is disclosed in Note 2 to our condensed consolidated financial statements appearing in this Quarterly Report on Form 10-Q.

Emerging Growth Company Status and Smaller Reporting Company

As an "emerging growth company," the Jumpstart Our Business Startups Act of 2012 allows us to delay adoption of new or revised accounting standards applicable to public companies until such standards are made applicable to private companies. However, we have irrevocably elected not to avail ourselves of this extended transition period for complying with new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

We are also a "smaller reporting company" meaning that the market value of our stock held by non-affiliates is less than $700 million and our annual revenue was less than $100 million during our most recently completed fiscal year. We may continue to be a smaller reporting company if either (i) the market value of our stock held by non-affiliates is less than $250 million or (ii) our annual revenue was less than $100 million during the most recently completed fiscal year and the market value of our stock held by non-affiliates is less than $700 million. If we are a smaller reporting company at the time we cease to be an emerging growth company, we may continue to rely on exemptions from certain disclosure requirements that are available to smaller reporting companies. For so long as we remain a smaller reporting company, we are permitted and intend to rely on exemptions from certain disclosure and other requirements that are applicable to other public companies that are not smaller reporting companies.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

We are exposed to market risk from changes in interest rates, foreign exchange rates and inflation. All of these market risks arise in the ordinary course of business, as we do not engage in speculative trading activities. The following analysis provides additional information regarding these risks.

Foreign Currency and Exchange Risk

We are subject to the risk of fluctuations in foreign currency exchange rates, specifically with respect to the euro. Our functional currency is the U.S. dollar and the functional currency of our wholly owned foreign subsidiary, HOOKIPA Biotech GmbH, is the euro. Our cash, cash equivalents and restricted cash as of June 30, 2024 included small amounts of cash balances held by HOOKIPA Biotech GmbH in euro. Assets and liabilities of HOOKIPA Biotech GmbH are translated into U.S. dollars at the exchange rate in effect on the balance sheet date. Income items and expenses are translated at the average exchange rate in effect during the period. Unrealized translation gains and losses are recorded as

a cumulative translation adjustment, which is included in the condensed consolidated Statements of Convertible Preferred Stock and Stockholders' Equity as a component of accumulated other comprehensive loss. Adjustments that arise from exchange rate changes on transactions denominated in a currency other than the local currency are included in other income and expenses, net in the condensed consolidated Statements of Operations and Comprehensive Loss as incurred. A significant portion of our operating costs are in Austria, which are denominated in the euro. This foreign currency exposure gives rise to market risk associated with exchange rate movements of the U.S. dollar against the euro. Furthermore, we anticipate that a significant portion of our expenses will continue to be denominated in the euro. A hypothetical 10% weakening of the U.S. dollar compared to the euro would have increased our net loss for the six months ended June 30, 2024, by approximately $1.9 million and increased our currency translation adjustment by approximately $1.1 million. A hypothetical 10% strengthening of the U.S. dollar compared to the euro would have an equal and opposite effect on our financial statements.

Interest Rate Risk

We are exposed to market risk related to changes in interest rates. We had cash, cash equivalents and restricted cash of $77.4 million as of June 30, 2024, which included account balances with foreign banks. Interest income is sensitive to changes in the general level of interest rates; however, due to the nature of these investments, we do not believe that we have any material exposure to changes in the fair value of our investment portfolio as a result of changes in interest rates.

Impacts of Inflation

While it is difficult to accurately measure the impact of inflation due to the imprecise nature of the estimates required, we do not believe inflation has had a material effect on our historical results of operations and financial condition. However, inflation, has had, and may continue to have, an impact on the labor costs we incur to attract and retain qualified personnel, costs to conduct clinical trials and other operational costs. If our costs were to become subject to significant inflationary pressures, we may not be able to fully offset higher costs through raising funds or other corrective measures, and our inability or failure to do so could adversely affect our business, financial condition, and results of operations. In addition, increased inflation has had, and may continue to have, an effect on interest rates. Increased interest rates may adversely affect our borrowing rate and our ability to obtain, or the terms under which we can obtain, any potential additional funding.

Item 4. Controls and Procedures.

The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, refers to controls and procedures that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure.

In designing and evaluating our disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints and that management is required to apply judgment in evaluating the benefits of possible controls and procedures relative to their costs.

Evaluation of Disclosure Controls and Procedures

As of June 30, 2024, management, with the participation of our Principal Executive Officer and Principal Financial and Accounting Officer, evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). Our disclosure controls and procedures are designed to ensure that information required to be disclosed in the reports we file or submit under the Exchange Act is recorded, processed,

summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including the Chief Executive Officer and the Chief Financial and Accounting Officer, to allow timely decisions regarding required disclosures.

Any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objective and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on that evaluation, our Principal Executive Officer and Principal Financial and Accounting Officer concluded that our disclosure controls and procedures were effective at a reasonable assurance level as of June 30, 2024.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rules 13a 15(f) and 15d 15(f) under the Exchange Act) identified that occurred during the quarter ended June 30, 2024 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

Item 1. Legal Proceedings.

We are not currently a party to any material legal proceedings. From time to time, we may become involved in litigation or legal proceedings relating to claims arising in the ordinary course of business.

Item 1A. Risk Factors.

Our business is subject to risks and events that, if they occur, could adversely affect our financial condition and results of operations and the trading price of our securities. Except as set forth below, there have been no material changes from our risk factors described in "Part I, Item 1A. Risk Factors" of our Annual Report on Form 10-K for the year ended December 31, 2023.

We are highly dependent on our key personnel to grow our business, and if we are not successful in attracting and retaining highly qualified personnel, we may not be able to successfully implement our business strategy.

We are highly dependent on members of our executive team. Although we have formal employment agreements with our executive officers, any of our executive officers could leave our employment at any time, or within a contractual termination period that is too short to find an adequate replacement. We currently do not have "key person" insurance on any of our employees. The loss of the services of our executive officers or other key employees may adversely impact the achievement of our research, development and commercialization objectives and seriously harm our ability to successfully implement our business strategy. Any significant leadership change or senior management transition involves risk, especially nearly simultaneous changes involving senior level leadership positions. For example, on July 22, 2024, Joern Aldag separated as our Chief Executive Officer and Reinhard Kandera separated as our Chief Financial Officer. In addition, on July 22, 2024, Dr. Malte Peters was appointed as our Chief Executive Officer and Terry Coelho was appointed as our Executive Vice President and Chief Financial Officer. Any failure to effectively transition these senior executive leadership changes or to retain Dr. Peters or Ms. Coelho on our executive team could hinder our strategic planning, business execution and future performance.

Recruiting and retaining qualified employees, consultants and advisors for our business, including scientific and technical personnel, also will be critical to our success. We primarily conduct our operations at our facility in Vienna, Austria. This region is headquarters to many other biopharmaceutical companies and many academic and research institutions. Competition for skilled personnel is intense and the turnover rate can be high. We may not be able to attract and retain personnel on acceptable terms given the competition among numerous biotechnology and pharmaceutical companies and academic institutions for skilled individuals. In addition, failure to succeed in preclinical studies, clinical trials or applications for marketing approval may make it more challenging to recruit and retain qualified personnel.

To induce valuable employees to join and remain at our company, in addition to salary and cash incentives, we have provided, and intend to continue to provide, stock options that vest over time. The value of these equity grants that

vest over time to our employees may be significantly affected by movements in the fair market value of our capital stock that are beyond our control, and may at any time be insufficient to counteract more lucrative offers from other companies.

Moreover, many of our employees have become or will soon become vested in a substantial amount of our common stock or a number of common stock options. Our employees may be more likely to leave us if the shares they own have significantly appreciated in value relative to the original purchase prices of the shares, or if the exercise prices of the options that they hold are significantly below the market price of our common stock.

Accordingly, our future success depends on our ability to continue to attract and retain current and additional executive officers and other key employees. The inability to recruit, or the loss of services of certain executives, key employees, consultants or advisors, may impede the progress of our research, development and commercialization objectives and have a material adverse effect on our business, financial condition, results of operations and prospects.

There is substantial doubt regarding our ability to continue as a going concern. We will need to raise substantial additional funding, which may not be available on acceptable terms, if at all, to be able to continue as a going concern and advance any our product candidates. Failure to obtain capital when needed may force us to delay, limit or terminate our product development efforts or other operations. Raising additional capital may dilute our existing shareholders, restrict our operations or cause us to relinquish valuable rights.

There is substantial doubt regarding our ability to continue as a going concern. Our continued existence is dependent upon our ability to obtain additional capital. As of December 31, 2023, and June 30, 2024, we had cash, cash equivalents and restricted cash of approximately $117.5 million and $77.4 million, respectively. Our management believes that such cash, cash equivalents and restricted cash will not be sufficient to fund our operating expenses and capital requirements for one year after the date that the financial statements are issued, whether or not we curtail efforts with respect to certain of our product candidates. We will require significant additional funding to advance any of our product candidates beyond the short term.

We are seeking funds through collaborations, strategic alliances, or licensing arrangements with third parties, and such agreements may impact rights to our product candidates or technologies, future revenue streams, research programs or products candidates or to grant licenses on terms that may not be favorable to us. Such arrangements will limit our participation in the success of any of our product candidates that receive regulatory approval.

We may also seek to raise such capital through public or private equity, royalty financing or debt financing. Raising funds in the current economic environment is challenging and financing may not be available in sufficient amounts or on acceptable terms, if at all. The issuance of additional securities, whether equity or debt, or the possibility of such issuance, may cause the market price of our shares to decline. The sale of additional equity or convertible securities may dilute the ownership of existing shareholders. Incurring debt would result in increased fixed payment obligations, and we may agree to restrictive covenants, such as limitations on our ability to incur additional debt or limitations on our ability to acquire, sell or license intellectual property rights that could impede our ability to conduct our business.

Item 5. Other Information.

During the three months ended June 30, 2024, none of the Company's directors or officers (as defined in Rule 16a-1(f) of the Securities Exchange Act) adopted, terminated or modified a Rule 10b5-1 trading arrangement or non-Rule 10b5-1 trading arrangement (as such terms are defined in Item 408 of Regulation S-K).

Item 6. Exhibits.

The exhibits listed on the Exhibit Index immediately preceding such exhibits, which is incorporated herein by reference, are filed or furnished as part of this Quarterly Report on Form 10-Q.

Exhibit Number	Description
1.1*	Open Market Sale Agreement[SM] between Jefferies LLC and the Company, dated August 8, 2024
3.1	Amended and Restated Certificate of Incorporation of the Company (filed as Exhibit 3.1 to the Company's Annual Report on Form 10-K filed on March 24, 2022 (File No. 001-38869) and incorporated herein by reference)
3.1.1	Certificate of Amendment of the Amended and Restated Certificate of Incorporation of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K filed on July 1, 2022 (File No. 001-38869) and incorporated herein by reference)
3.1.2	Certificate of Designation of Preferences, Rights and Limitations of the Series A Preferred Stock of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K filed on December 11, 2020 (File No. 001-38869) and incorporated herein by reference)
3.1.3	Certificate of Designation of Preferences, Rights and Limitations of the Series A-1 Preferred Stock of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K filed on March 3, 2022 (File No. 001-38869) and incorporated herein by reference)
3.1.4	Certificate of Designation of Preferences, Rights and Limitations of the Series A-2 Preferred Stock of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K filed on June 2, 2023 (File No. 001-38869) and incorporated herein by reference)
3.1.5	Certificate of Amendment of Amended and Restated Certificate of Incorporation of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K filed on June 18, 2024 (File No. 001-38869) and incorporated herein by reference)
3.1.6	Certificate of Amendment of Amended and Restated Certificate of Incorporation of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K filed on July 10, 2024 (File No. 001-38869) and incorporated herein by reference)
3.2	Amended and Restated Bylaws of the Company (filed as Exhibit 3.2 to the Company's Current Report on Form 8-K filed on April 23, 2019 (File No. 001-38869) and incorporated herein by reference)
10.1#	Employment Agreement between Dr. Malte Peters and HOOKIPA Biotech GmbH, dated July 22, 2024 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K filed on July 26, 2024 (File No. 001-38869) and incorporated herein by reference)
10.2#	Employment Agreement between Terry Coelho and the Company, dated July 22, 2024 (filed as Exhibit 10.2 to the Company's Current Report on Form 8-K filed on July 26, 2024 (File No. 001-38869) and incorporated herein by reference)
31.1*	Certificate of Principal Executive Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Certificate of Principal Financial Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1**	Certificate of Principal Executive Officer and 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.INS*	Inline XBRL Instance Document
101.SCH*	Inline XBRL Taxonomy Extension Schema Document
101.CAL*	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104*	Cover Page Interactive Data File (formatted as inline XBRL with applicable taxonomy extension information contained in Exhibits 101)

* Filed herewith.

** The certification furnished in Exhibit 32.1 hereto is deemed to accompany this Quarterly Report on Form 10-Q and will not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liability of that section. Such certification will not be deemed to be incorporated by reference into any filings under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, except to the extent that the Registrant specifically incorporates it by reference.

# Indicates a management contract or compensatory plan or arrangement.

SIGNATURES

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.

HOOKIPA Pharma Inc.

Date: August 8, 2024

By: /s/ Malte Peters
Malte Peters
Chief Executive Officer (Principal Executive Officer)

By: /s/ Terry Coelho
Terry Coelho
Executive Vice President and Chief Financial Officer
(Principal Financial and Accounting Officer)

Exhibit 1.1

OPEN MARKET SALE AGREEMENT[SM]

August 8, 2024

JEFFERIES LLC
520 Madison Avenue
New York, New York 10022

Ladies and Gentlemen:

HOOKIPA Pharma Inc., a Delaware corporation (the "**Company**"), proposes, subject to the terms and conditions stated herein, to issue and sell from time to time through Jefferies LLC, as sales agent and/or principal (the "**Agent**"), shares of the Company's common stock, par value $0.0001 per share (the "**Common Shares**"), having an aggregate offering price of up to $50,000,000 on the terms set forth in this agreement (this "**Agreement**").

Section 1. DEFINITIONS

(a) Certain Definitions. For purposes of this Agreement, capitalized terms used herein and not otherwise defined shall have the following respective meanings:

"**Affiliate**" of a Person means another Person that directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such first- mentioned Person. The term "control" (including the terms "controlling," "controlled by" and "under common control with") means the possession, direct or indirect, of the power to direct or cause the direction of the management and policies of a Person, whether through the ownership of voting securities, by contract or otherwise.

"**Agency Period**" means the period commencing on the date of this Agreement and expiring on the earliest to occur of (x) the date on which the Agent shall have placed the Maximum Program Amount (as defined below) pursuant to this Agreement and (y) the date this Agreement is terminated pursuant to Section 7.

"**Commission**" means the U.S. Securities and Exchange Commission.

"**Exchange Act**" means the Securities Exchange Act of 1934, as amended, and the rules and regulations of the Commission thereunder.

"**Floor Price**" means the minimum price set by the Company in the Issuance Notice below which the Agent shall not sell Shares during the applicable period set forth in the applicable Issuance Notice, which may be adjusted by the Company at any time during the period set forth in the applicable Issuance Notice by delivering written notice of such change to the Agent.

SM "Open Market Sale Agreement" is a service mark of Jefferies LLC

"**Issuance Amount**" means the aggregate Sales Price of the Shares to be sold by the Agent pursuant to any Issuance Notice.

"**Issuance Notice**" means a written notice delivered to the Agent by the Company in accordance with this Agreement in the form attached hereto as Exhibit A that is executed by its Chief Executive Officer, President or Chief Financial Officer.

"**Issuance Notice Date**" means any Trading Day during the Agency Period that an Issuance Notice is delivered pursuant to Section 3(b)(i).

"**Issuance Price**" means the Sales Price less the Selling Commission.

"**Maximum Program Amount**" means Common Shares with an aggregate Sales Price of the lesser of (a) the number or dollar amount of Common Shares registered under the effective Registration Statement (defined below) pursuant to which the offering is being made, (b) the number of authorized but unissued Common Shares (less Common Shares issuable upon exercise, conversion or exchange of any outstanding securities of the Company or otherwise reserved from the Company's authorized capital stock), (c) the number or dollar amount of Common Shares permitted to be sold under Form S-3 (including General Instruction I.B.6 thereof, if applicable), or (d) the number or dollar amount of Common Shares for which the Company has filed a Prospectus (defined below).

"**Person**" means an individual or a corporation, partnership, limited liability company, trust, incorporated or unincorporated association, joint venture, joint stock company, governmental authority or other entity of any kind.

"**Rule 462(b) Registration Statement**" means any registration statement filed by the Company pursuant to Rule 462(b) under the Securities Act in connection with the offer and sale of Shares.

"**Sales Price**" means the actual sale execution price of each Share placed by the Agent pursuant to this Agreement.

"**Securities Act**" means the Securities Act of 1933, as amended, and the rules and regulations of the Commission thereunder.

"**Selling Commission**" means three percent (3%) of the gross proceeds of Shares sold pursuant to this Agreement, or as otherwise agreed between the Company and the Agent with respect to any Shares sold pursuant to this Agreement.

"**Settlement Date**" means the first business day, or such other time period as required by the Exchange Act or by the rules promulgated thereunder, following each Trading Day during the period set forth in the applicable Issuance Notice on which Shares are sold pursuant to this Agreement, when the Company shall deliver to the Agent the amount of Shares sold on such Trading Day and the Agent shall deliver to the Company the Issuance Price received on such sales.

"**Shares**" means the Company's Common Shares issued or issuable pursuant to this Agreement.

"**Trading Day**" means any day on which the Nasdaq Stock Market LLC ("**Nasdaq**") is open for trading.

Section 2. REPRESENTATIONS AND WARRANTIES OF THE COMPANY

The Company represents and warrants to, and agrees with, the Agent that as of (1) the date of this Agreement, (2) each Issuance Notice Date, (3) each Settlement Date, (4) each Triggering Event Date (as defined below) and (5) as of each Time of Sale (as defined below) (each of the times referenced above is referred to herein as a "**Representation Date**"), except as may be disclosed in the Prospectus (including any documents incorporated by reference therein and any supplements thereto) on or before a Representation Date:

(a) Registration Statement. The Company and the transactions contemplated by this Agreement meet the requirements for and comply with the conditions for the use of Form S-3 (including General Instructions I.A and I.B.1.) under the Securities Act. The Registration Statement (as defined below), including a base prospectus relating to certain securities including the Common Shares, has been filed with the Commission and was declared effective by the Commission on July 21, 2022 under the Securities Act prior to the issuance of any Issuance Notices by the Company, and any required Rule 462(b) Registration Statement will be declared effective by the Commission under the Securities Act prior to the first Issuance Notice. At the time the Registration Statement originally became effective and at the time the Company's Annual Report on Form 10-K for the year ended December 31, 2023, was filed with the Commission, the Company met the then-applicable requirements for use of Form S-3 (including General Instructions I.A and I.B.1.) under the Securities Act. The Registration Statement meets, and the offering and sale of Shares as contemplated hereby comply with, the requirements of Rule 415(a)(1)(x) under the Securities Act. The Agent is named as the agent engaged by the Company in the section entitled "Plan of Distribution" in the Prospectus (as defined below). The Company has not received, and has no notice from the Commission of, any notice pursuant to Rule 401(g)(1) under the Securities Act objecting to the use of the Registration Statement. No stop order of the Commission preventing or suspending the use of the base prospectus, or the Prospectus (as defined below), or the effectiveness of the Registration Statement, has been issued, and no proceedings for such purpose are pending before or, to the knowledge of the Company, threatened by the Commission. At the time of the initial filing of the Registration Statement, the Company paid the required Commission filing fees relating to the securities covered by the Registration Statement, including the Shares that may be sold pursuant to this Agreement, in accordance with Rule 457(o) under the Securities Act. Copies of the Registration Statement, the Prospectus, any such amendments or supplements to any of the foregoing and all documents that are or are deemed to be incorporated by reference therein (the "**Incorporated Documents**") that were filed with the Commission on or prior to the date of this Agreement have been delivered, or are available through EDGAR, to the Agent and its counsel. The Company will furnish to the Agent, for use by the Agent, copies of the base prospectus included as part of such Registration Statement at the time it became effective. Except where the context otherwise requires, such Registration Statement, including all documents filed as part thereof or incorporated by reference therein, and including any information contained in a Prospectus (as defined below) subsequently filed with the Commission pursuant to Rule 424(b) under the Securities Act or deemed to be a part of such Registration Statement pursuant to Rule 430B or Rule 462(b) under the Securities Act, is herein called the "**Registration Statement**." The base prospectus constituting a part of such Registration Statement, together with any prospectus supplement filed with the Commission pursuant to Rule 424(b) under the Securities Act relating to a particular

issuance of the Shares, including all documents incorporated or deemed to be incorporated therein by reference pursuant to Item 12 of Form S-3 under the Securities Act, together with any "issuer free writing prospectus" (as used herein, as defined in Rule 433 under the Securities Act ("**Rule 433**")), in each case, as from time to time amended or supplemented, is referred to herein as the "**Prospectus**".

(b) No Misstatement or Omission. Each of the Registration Statement and any post-effective amendment thereto, at the time it became or becomes effective, at each deemed effective date with respect to the Agent pursuant to Rule 430B(f)(2) under the Securities Act and as of each Representation Date, complied, complies and will comply in all material respects with the requirements of the Securities Act and did not, does not and will not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading, except that the representations and warranties set forth in this sentence do not apply to Agent's Information (as defined herein). The Prospectus and any amendment or supplement thereto, when so filed with the Commission under Rule 424(b) under the Securities Act, complied, complies and as of each Representation Date will comply in all material respects with the requirements of the Securities Act, and the Prospectus or issuer free writing prospectus (or any amendments or supplements to any of the foregoing) furnished to the Agent for use in connection with the offering of the Shares was identical to the electronically transmitted copies thereof filed with the Commission pursuant to EDGAR, except to the extent permitted by Regulation S-T. Neither the Prospectus nor any amendment or supplement thereto, as of its date and as of each Representation Date, included, includes or will include an untrue statement of a material fact or omitted, omits or will omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading, except that the representations and warranties set forth in this sentence do not apply to the Agent's Information (as defined herein). Each Incorporated Document heretofore filed, when it was filed (or, if any amendment with respect to any such document was filed, when such amendment was filed), conformed in all material respects with the requirements of the Exchange Act and were filed on a timely basis with the Commission, and any further Incorporated Documents so filed and incorporated after the date of this Agreement will be filed on a timely basis and, when so filed, will conform in all material respects with the requirements of the Exchange Act; no such Incorporated Document when it was filed (or, if an amendment with respect to any such document was filed, when such amendment was filed), contained an untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; and no such Incorporated Document, when it is filed, will contain an untrue statement of a material fact or will omit to state a material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading.

(c) Company Not Ineligible Issuer. (i) At the time of filing the Registration Statement and (ii) at the time of the execution of this Agreement (with such date being used as the determination date for purposes of this clause (ii)), the Company was not and is not an "ineligible issuer" (as defined in Rule 405), without taking account of any determination by the Commission pursuant to Rule 405 that it is not necessary that the Company be considered an ineligible issuer.

(d) Emerging Growth Company Status. From the time of the initial filing of the Company's first registration statement with the Commission through the date hereof, the Company has been and

is an "emerging growth company," as defined in Section 2(a) of the Securities Act (an "**Emerging Growth Company**")

(e) Issuer Free Writing Prospectuses. Each issuer free writing prospectus, as of its issue date and as of each Representation Date, did not, does not and will not include any information that conflicted, conflicts or will conflict with the information contained in the Registration Statement or the Prospectus, including any Incorporated Document deemed to be a part thereof that has not been superseded or modified. Each issuer free writing prospectus that the Company has filed, or is required to file, pursuant to Rule 433 or that was prepared by or on behalf of or used by the Company complies or will comply in all material respects with the requirements of the Securities Act.

(f) Distribution of Offering Material by the Company. The Company has not distributed and, prior to the later to occur of each Settlement Date and completion of the Agent's distribution of the Shares under this Agreement, will not distribute any offering material in connection with the offering and sale of the Shares other than the Registration Statement, the Prospectus or any free writing prospectus consented to by the Agent or by the Company, as the case may be.

(g) Extensible Business Reporting Language. The interactive data in eXtensible Business Reporting Language included or incorporated by reference in the Registration Statement and the Prospectus fairly presents the information called for in all material respects and has been prepared in accordance with the Commission's rules and guidelines applicable thereto.

(h) Independent Accountants. The accountants who certified the financial statements and supporting schedules included in the Registration Statement, and the Prospectus are independent public accountants as required by the Securities Act and the Public Company Accounting Oversight Board.

(i) Financial Statements. The financial statements included in the Registration Statement and the Prospectus, together with the related schedules and notes, present fairly, in all material respects, the financial position of the Company and its consolidated Subsidiaries (as defined below) at the dates indicated and the statement of operations, stockholders' equity and cash flows of the Company and its consolidated Subsidiaries for the periods specified; said financial statements have been prepared in conformity with U.S. generally accepted accounting principles ("**GAAP**") applied on a consistent basis throughout the periods involved. The supporting schedules, if any, present fairly, in all material respects, in accordance with GAAP the information required to be stated therein. The selected financial data and the summary financial information included in the Registration Statement and the Prospectus present fairly the information shown therein and have been compiled on a basis consistent with that of the audited financial statements included therein. Except as included therein, no historical or pro forma financial statements or supporting schedules are required to be included or incorporated by reference in the Registration Statement or the Prospectus under the Securities Act.

(j) No Material Adverse Change in Business. Except as otherwise stated therein, since the respective dates as of which information is given in the Registration Statement or the Prospectus, (A) there has been no material adverse change in the condition, financial or otherwise, or in the earnings, business affairs or business prospects of the Company and its Subsidiaries considered as one enterprise, whether or not arising in the ordinary course of business (a "**Material Adverse Change**"), (B) there have been no transactions entered into by the Company or any of its Subsidiaries, other than

those in the ordinary course of business, which are material with respect to the Company and its Subsidiaries considered as one enterprise, and (C) there has been no dividend or distribution of any kind declared, paid or made by the Company on any class of its capital stock.

(k) Good Standing of the Company. The Company has been duly organized and is validly existing as a corporation in good standing under the laws of the State of Delaware and has corporate power and authority to own, lease and operate its properties and to conduct its business as described in the Registration Statement and the Prospectus and to enter into and perform its obligations under this Agreement; and the Company is duly qualified as a foreign corporation to transact business and is in good standing in each other jurisdiction in which such qualification is required, whether by reason of the ownership or leasing of property or the conduct of business, except where the failure so to qualify or to be in good standing would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change.

(l) Good Standing of Subsidiaries. Each "significant subsidiary" of the Company (as such term is defined in Rule 1-02 of Regulation S-X) (each, a "**Subsidiary**" and, collectively, the "**Subsidiaries**") has been duly organized and is validly existing in good standing under the laws of the jurisdiction of its incorporation or organization, has corporate or similar power and authority to own, lease and operate its properties and to conduct its business as described in the Registration Statement and the Prospectus and is duly qualified to transact business and is in good standing in each jurisdiction in which such qualification is required, whether by reason of the ownership or leasing of property or the conduct of business, except where the failure to so qualify or to be in good standing would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change. Except as otherwise disclosed in the Registration Statement and the Prospectus, all of the issued and outstanding capital stock of each Subsidiary has been duly authorized and validly issued, is fully paid and non-assessable and is owned by the Company, directly or through Subsidiaries, free and clear of any security interest, mortgage, pledge, lien, encumbrance, claim or equity. None of the outstanding shares of capital stock of any Subsidiary were issued in violation of the preemptive or similar rights of any securityholder of such Subsidiary. The only subsidiaries of the Company are the subsidiaries listed on Exhibit 21 to the Company's Annual Report on Form 10-K for the year ended December 31, 2023.

(m) Capitalization. The authorized, issued and outstanding shares of capital stock of the Company are set forth in the Registration Statement and the Prospectus as of the dates referred to therein (except for subsequent issuances, if any, pursuant to this Agreement, pursuant to reservations, agreements or employee benefit plans referred to in the Registration Statement and the Prospectus or pursuant to the exercise of convertible securities or options referred to in the Registration Statement and the Prospectus). The outstanding shares of capital stock of the Company have been duly authorized and validly issued and are fully paid and non-assessable. None of the outstanding shares of capital stock of the Company were issued in violation of the preemptive or other similar rights of any securityholder of the Company.

(n) Authorization of Agreement. This Agreement has been duly authorized, executed and delivered by the Company.

(o) Authorization and Description of Shares. The Shares have been duly authorized for issuance and sale pursuant to this Agreement and, when issued and delivered by the Company pursuant

to this Agreement against payment of the consideration set forth herein, will be validly issued and fully paid and non-assessable; and the issuance of the Shares is not subject to the preemptive or other similar rights of any securityholder of the Company. The Common Shares conform in all material respects to all statements relating thereto contained in the Registration Statement and the Prospectus and such description conforms in all material respects to the rights set forth in the instruments defining the same. No holder of Shares will be subject to personal liability by reason of being such a holder.

(p) Registration Rights. There are no persons with registration rights or other similar rights to have any securities registered for sale pursuant to the Registration Statement or otherwise registered for sale or sold by the Company under the Securities Act pursuant to this Agreement, other than those rights that have been disclosed in the Registration Statement and the Prospectus.

(q) Absence of Violations, Defaults and Conflicts. Neither the Company nor any of its Subsidiaries is (A) in violation of its charter, by-laws or similar organizational document, (B) in default in the performance or observance of any obligation, agreement, covenant or condition contained in any contract, indenture, mortgage, deed of trust, loan or credit agreement, note, lease or other agreement or instrument to which the Company or any of its Subsidiaries is a party or by which it or any of them may be bound or to which any of the properties or assets of the Company or any Subsidiary is subject (collectively, "**Agreements and Instruments**"), except for such defaults that would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change, or (C) in violation of any law, statute, rule, regulation, judgment, order, writ or decree of any arbitrator, court, governmental body, regulatory body, administrative agency or other authority, body or agency having jurisdiction over the Company or any of its Subsidiaries or any of their respective properties, assets or operations (each, a "**Governmental Entity**"), except for such violations that would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change. The execution, delivery and performance of this Agreement and the consummation of the transactions contemplated herein and in the Registration Statement and the Prospectus (including the issuance and sale of the Shares and the use of the proceeds from the sale of the Shares as described therein under the caption "Use of Proceeds") and compliance by the Company with its obligations hereunder have been duly authorized by all necessary corporate action and do not and will not, whether with or without the giving of notice or passage of time or both, conflict with or constitute a breach of, or default or Repayment Event (as defined below) under, or result in the creation or imposition of any lien, charge or encumbrance upon any properties or assets of the Company or any Subsidiary pursuant to, the Agreements and Instruments (except for such conflicts, breaches, defaults or Repayment Events or liens, charges or encumbrances that would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change), nor will such action result in any violation of (x) the provisions of the charter, by-laws or similar organizational document of the Company or any of its Subsidiaries or (y) any law, statute, rule, regulation, judgment, order, writ or decree of any Governmental Entity, except with respect to clause (y), such violations as would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change. As used herein, a "**Repayment Event**" means any event or condition which gives the holder of any note, debenture or other evidence of indebtedness (or any person acting on such holder's behalf) the right to require the repurchase, redemption or repayment of all or a portion of such indebtedness by the Company or any of its Subsidiaries.

(r) Absence of Labor Dispute. Except as would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change, (a) no labor dispute with the employees of the Company or any of its Subsidiaries exists or, to the Company's knowledge, is imminent, and (b) to

the Company's knowledge, there is no existing or imminent labor disturbance by the employees of any of its or any Subsidiary's principal suppliers, manufacturers, customers or contractors.

(s) Absence of Proceedings. Except as disclosed in the Registration Statement and the Prospectus, there is no action, suit, proceeding, inquiry or investigation before or brought by any Governmental Entity (including without limitation, the U.S. Food and Drug Administration (the "**FDA**") or the European Medicines Agency (the "**EMA**") now pending or, to the Company's knowledge, threatened, against or affecting the Company or any of its Subsidiaries, which would reasonably be expected to result, singly or in the aggregate, in a Material Adverse Change, or which would reasonably be expected to, singly or in the aggregate, materially and adversely affect their respective properties or assets or the consummation of the transactions contemplated in this Agreement or the performance by the Company of its obligations hereunder; and the aggregate of all pending legal or governmental actions, suits, inquiries or proceedings to which the Company or any such Subsidiary is a party or of which any of their respective properties or assets is the subject which are not described in the Registration Statement and the Prospectus, including ordinary routine litigation incidental to the business, would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change.

(t) Accuracy of Exhibits. There are no contracts or documents which are required to be described in the Registration Statement or the Prospectus or to be filed as exhibits to the Registration Statement which have not been so described and filed as required.

(u) Absence of Further Requirements. No filing with, or authorization, approval, consent, license, order, registration, qualification or decree of, any Governmental Entity is necessary or required for the performance by the Company of its obligations hereunder, in connection with the offering, issuance or sale of the Shares hereunder or the consummation of the transactions contemplated by this Agreement, except such as have been already obtained or as may be required under the Securities Act, the rules of the Nasdaq Global Select Market, state securities laws or the rules of Financial Industry Regulatory Authority, Inc. ("**FINRA**").

(v) Possession of Licenses and Permits. The Company and its Subsidiaries possess such permits, licenses, approvals, consents and other authorizations (collectively, "**Governmental Licenses**") issued by the appropriate Governmental Entities necessary to conduct the business now operated by them (including, without limitation, all such permits, licenses, approvals, consents and other authorizations required by the FDA, the EMA, or any other federal, state, local or foreign agencies or bodies engaged in the regulation of clinical or preclinical studies, pharmaceuticals, biologics or activities related to the business now operated by the Company and its Subsidiaries), except where the failure so to possess would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change. The Company and its Subsidiaries are in compliance with the terms and conditions of all Governmental Licenses, except where the failure so to comply would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change. All of the Governmental Licenses are valid and in full force and effect, except when the invalidity of such Governmental Licenses or the failure of such Governmental Licenses to be in full force and effect would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change. Neither the Company nor any of its Subsidiaries has received any notice of proceedings relating to the revocation or modification of any Governmental Licenses which, singly or in the aggregate, if the subject of an unfavorable decision, ruling or finding, would reasonably be expected to result in a

Material Adverse Change. The Company and its Subsidiaries (i) are, and at all times have been, in compliance with all statutes, rules and regulations applicable to the ownership, testing, development, manufacture, packaging, processing, use, distribution, storage, import, export or disposal of any product manufactured or distributed by the Company or its Subsidiaries ("**Applicable Laws**"), except where such noncompliance would not, singly or in the aggregate, result in a Material Adverse Change; and (ii) have not received any FDA Form 483, written notice of adverse finding, warning letter, untitled letter or other correspondence or written notice from any court or arbitrator or governmental or regulatory authority alleging or asserting noncompliance with (x) any Applicable Laws or (y) any licenses, exemptions, certificates, approvals, clearances, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws, except where being in contravention of any of the foregoing representations or warranties, singly or in the aggregate, would not result in a Material Adverse Change.

(w) Title to Property. The Company and its Subsidiaries have good and marketable title to all real property owned by them and good title to all other properties owned by them, in each case, free and clear of all mortgages, pledges, liens, security interests, claims, restrictions or encumbrances of any kind except such as (A) are described in the Registration Statement and the Prospectus or (B) do not, singly or in the aggregate, materially affect the value of such property and do not materially interfere with the use made and proposed to be made of such property by the Company or any of its Subsidiaries; and all of the leases and subleases material to the business of the Company and its Subsidiaries, considered as one enterprise, and under which the Company or any of its Subsidiaries holds properties described in the Registration Statement or the Prospectus, are in full force and effect, and neither the Company nor any such Subsidiary has any notice of any material claim of any sort that has been asserted by anyone adverse to the rights of the Company or any Subsidiary under any of the leases or subleases mentioned above, or affecting or questioning the rights of the Company or such Subsidiary to the continued possession of the leased or subleased premises under any such lease or sublease.

(x) Possession of Intellectual Property.

i. Except as otherwise disclosed in the Registration Statement and the Prospectus, and to the Company's knowledge, the Company and its Subsidiaries own or possess, have license to, or can acquire rights to (whether by ownership or license) on reasonable terms, all patents, patent applications, statutory invention rights, community designs, invention disclosures, rights in utility models and industrial designs, inventions, registered and unregistered copyrights (including copyrights in software), intellectual property rights in technology, software, data, know-how (including inventions, trade secrets and other unpatented and/or unpatentable proprietary or confidential information, systems or procedures), trademarks, service marks, trade names, business names, logos, slogans, trade dress, design rights, Internet domain names, social media accounts, any other designations of source or origin, and any applications (including provisional applications), registrations, or renewals for any of the foregoing, rights to publicity and privacy and/or other intellectual property (collectively, "**Intellectual Property**") necessary to carry on the business now operated by them and, to the Company's knowledge, as currently proposed to be conducted as disclosed in the Registration Statement and the Prospectus.

ii. Except as otherwise disclosed in the Registration Statement and the Prospectus, neither the Company nor any of its Subsidiaries has received any notice of or is otherwise aware of, nor to the Company's knowledge, engaged in, (i) any infringement, misappropriation or other violation of any Intellectual Property rights of any third party by the Company or any of its Subsidiaries and (ii) any pending or threatened action, suit, proceeding or claim regarding the subject matter of the foregoing.

iii. To the Company's knowledge, Intellectual Property owned by or exclusively licensed to the Company or any of its Subsidiaries (such Intellectual Property, the "**Company Intellectual Property**") is valid and enforceable, and there is no infringement, misappropriation, or violation of any Company Intellectual Property by any third party.

iv. Except as otherwise disclosed in the Registration Statement and the Prospectus, there is no pending action, suit, or proceeding by any third party, and the Company has not received a written notice regarding a threatened action, suit, proceeding or claim by any third party (1) challenging the Company's rights in or to any Company Intellectual Property; (2) challenging the validity, enforceability or scope of any Company Intellectual Property; or (3) asserting that the Company or any of its Subsidiaries infringes, misappropriates or otherwise violates, or would, upon the commercialization of any product or service under development as described in the Registration Statement and the Prospectus, infringe, misappropriate or otherwise violate, any Intellectual Property rights of such third parties that would materially impact the Company or any of its Subsidiaries.

v. Except as otherwise disclosed in the Registration Statement and the Prospectus, the Company and its Subsidiaries have complied in all material respects with the terms of each agreement pursuant to which Intellectual Property has been licensed to the Company or its Subsidiaries, and neither the Company nor any of its Subsidiaries has received any written notice alleging any such noncompliance.

vi. No Intellectual Property has been obtained or is being used by the Company in violation of any material contractual obligations binding on the Company or, to the Company's knowledge, in violation of any contractual rights of any person. All such agreements that are binding on the Company are in full force and effect.

vii. To the Company's knowledge, all registered Company Intellectual Property and applications therefor have been duly maintained in all material respects and are in full force and effect and there are no material defects in connection with the filing or prosecuting of any such Company Intellectual Property.

viii. Each person who is or was an employee of the Company or any of its Subsidiaries and who is or was involved in the creation or development of any Intellectual Property for or on behalf of the Company or any of its Subsidiaries has signed an agreement containing an assignment to the Company or any of its Subsidiaries of such person's rights in and to such Intellectual Property and, to the

Company's knowledge, no employee of the Company or any of its Subsidiaries is in or has ever been in violation of any material term of any agreement or covenant to or with a former employer where the basis of such violation relates to such employee's employment with the Company or any of its Subsidiaries or actions undertaken by the employee while employed with the Company or any of its Subsidiaries. To the extent a past contractor of the Company has been involved in the creation or development of any Intellectual Property necessary to carry on the business now operated, or as currently proposed to be conducted as disclosed in the Registration Statement and the Prospectus, by the Company or any of its Subsidiaries, such contractor has signed an agreement containing (1) an assignment of such contractor's rights in and to such Intellectual Property to the Company or any of its Subsidiaries or (2) granting an exclusive license to the Company or any of its Subsidiaries to use such Intellectual Property, and, in either case of (1) or (2) and to the Company's knowledge, no such contractor is in or has ever been in violation of a material term of such agreement. To the extent a current contractor has been retained by the Company or any of its Subsidiaries to, or is otherwise expected to, create or develop Intellectual Property necessary to carry on the business now operated, or as currently proposed to be conducted as disclosed in the Registration Statement and the Prospectus, by the Company or any of its Subsidiaries, such contractor has signed an agreement containing either (i) an assignment of, or an obligation to assign, such Intellectual Property to the Company or any of its Subsidiaries, (ii) an unconditional option for the Company to receive an exclusive license to such Intellectual Property or (iii) an exclusive license for the Company to use such Intellectual Property in connection with the business, and, in any case of (i)-(iii) to the Company's knowledge, no such contractor is in or has ever been in violation of a material term of such agreement. To the extent any such contractor agreements includes an obligation to assign Intellectual Property to the Company but does not actually assign such Intellectual Property, the absence of such assignment of Intellectual Property shall not have a material impact on (i) the business of the Company or any of its Subsidiaries as now operated or as currently proposed to be conducted as disclosed in the Registration Statement and the Prospectus or (ii) the Company's or any of its Subsidiary's right to the ownership of all right, title and interest in and to such Intellectual Property that is the subject of such obligation to assign.

ix. The Company and its Subsidiaries have taken the commercially reasonable steps necessary to protect, maintain and safeguard the confidentiality of the material trade secrets, all material confidential Intellectual Property used in connection with the business of the Company and its rights and licenses under material Intellectual Property owned by or licensed to the Company, including the execution of appropriate nondisclosure and confidentiality agreements, and, to the Company's knowledge, the confidentiality of such material trade secrets and material confidential Intellectual Property has not been compromised.

(y) Environmental Laws. Except as described in the Registration Statement and the Prospectus or would not, singly or in the aggregate, result in a Material Adverse Change, (A) neither the Company nor any of its Subsidiaries is in violation of any federal, state, local or foreign statute,

law, rule, regulation, ordinance, code, policy or rule of common law or any judicial or administrative interpretation thereof, including any judicial or administrative order, consent, decree or judgment, relating to pollution or protection of human health, the environment (including, without limitation, ambient air, surface water, groundwater, land surface or subsurface strata) or wildlife, including, without limitation, laws and regulations relating to the release or threatened release of chemicals, pollutants, contaminants, wastes, biological materials, toxic substances, hazardous substances, petroleum or petroleum products, asbestos-containing materials or mold (collectively, "**Hazardous Materials**") or to the manufacture, processing, distribution, use, treatment, storage, disposal, transport or handling of Hazardous Materials (collectively, "**Environmental Laws**"), (B) the Company and its Subsidiaries have all permits, authorizations and approvals required under any applicable Environmental Laws and are each in compliance with their requirements, (C) there are no pending or threatened administrative, regulatory or judicial actions, suits, demands, demand letters, claims, liens, notices of noncompliance or violation, investigations or proceedings relating to any Environmental Law against the Company or any of its Subsidiaries and (D) there are no events or circumstances that would reasonably be expected to form the basis of an order for clean-up or remediation, or an action, suit or proceeding by any private party or Governmental Entity, against or affecting the Company or any of its Subsidiaries relating to Hazardous Materials or any Environmental Laws.

(z) Regulatory Matters. Except as described in the Registration Statement and the Prospectus, and except as would not reasonably be expected to, singly or in the aggregate, have a Material Adverse Change: (i) neither the Company nor its Subsidiaries has received any written notice of adverse filing, warning letter, untitled letter or other correspondence or notice from the FDA, the EMA or other relevant regulatory authorities, or any other court or arbitrator or federal, state, local or foreign governmental or regulatory authority, alleging or asserting material noncompliance with the Federal Food, Drug and Cosmetic Act (21 U.S.C. § 301 et seq.), as amended, and the regulations promulgated thereunder (the "**FDCA**"), or similar state, federal or foreign law or regulation (collectively, "**Health Care Laws**"); (ii) the Company and its Subsidiaries are and have been in compliance in all material respects with applicable Health Care Laws; (iii) neither the Company nor its Subsidiaries have received written notice of any ongoing claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from any U.S. or non-U.S. federal, national, state, local or other governmental or regulatory authority, agency or body, court, arbitrator or self-regulatory organization (each, a "**Governmental Authority**") or third party alleging that any product operation or activity is in violation of any Health Care Laws; (iv) the Company and its Subsidiaries have filed, obtained, maintained or submitted all reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by applicable Health Care Laws, and that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were complete, correct and not misleading on the date filed (or were corrected or supplemented by a subsequent submission); (v) neither the Company nor its Subsidiaries or any of their respective directors, officers, employees or agents is or has been debarred, suspended or excluded, or has been convicted of any crime, engaged in any conduct or is subject to a governmental inquiry, investigation, proceeding or other similar action that would result in a debarment, suspension or exclusion from any federal or state government health care program or human research study trial; and (vi) the Company is not a party to and the Company does not have any ongoing reporting obligations pursuant to, any corporate integrity agreements, deferred prosecution agreements, monitoring agreements, consent decrees, settlement orders, plans of correction or similar agreements with or imposed by an Governmental Authority.

(aa) Preclinical and Clinical Studies and Tests. The preclinical and clinical studies and tests conducted by, on behalf of or sponsored by the Company or its Subsidiaries, or in which the Company or its Subsidiaries has participated, that are described in, or the results of which are referred to in, the Registration Statement and the Prospectus, as applicable, were, and if still pending are, being conducted in accordance with the experimental protocols established for each study or trial, as well as any conditions of approval and policies imposed by any institutional review board, ethics review board or committee responsible for the oversight of such preclinical and clinical studies and tests, and all applicable local, state and federal laws, rules and regulations of the FDA, the EMA and comparable drug regulatory agencies outside of the United States to which they are subject (collectively, the "**Regulatory Authorities**") except where the failure to be so in compliance has not resulted and would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change; the descriptions in the Registration Statement or the Prospectus of the results of such studies and tests are accurate and not misleading in all material respects with respect to the portions of such studies being described and fairly present the data derived from such studies or tests; the Company has no knowledge of any other studies or tests not described in the Registration Statement and the Prospectus, the results of which are inconsistent with or reasonably call into question the results described or referred to in the Registration Statement and the Prospectus when viewed in the context in which such results are described and the current state of development; neither the Company nor its Subsidiaries have received any written notice, correspondence or other communications from the Regulatory Authorities requiring or threatening (i) the termination or suspension of any preclinical and clinical studies or tests that are described in, or the results of which are referred to in, the Registration Statement and the Prospectus, or (ii) the material modification of any preclinical and clinical studies or tests that would cause them to differ from their descriptions in the Registration Statement and the Prospectus, other than ordinary course communications with respect to modifications in connection with the design and implementation of such studies or tests, and, to the Company's knowledge, there are no reasonable grounds for the same.

(bb) Accounting Controls. The Company and each of its Subsidiaries maintain effective internal control over financial reporting (as defined under Rules 13-a15 and 15d-15 under the Exchange Act) and a system of internal accounting controls sufficient to provide reasonable assurances that (A) transactions are executed in accordance with management's general or specific authorization; (B) transactions are recorded as necessary to permit preparation of financial statements in conformity with GAAP and to maintain accountability for assets; (C) access to assets is permitted only in accordance with management's general or specific authorization; and (D) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences. Except as described in the Registration Statement and the Prospectus, since the end of the Company's most recent audited fiscal year, there has been (1) no material weakness in the Company's internal control over financial reporting (whether or not remediated) and (2) no change in the Company's internal control over financial reporting that has materially and adversely affected, or is reasonably likely to materially and adversely affect, the Company's internal control over financial reporting.

(cc) Compliance with the Sarbanes-Oxley Act. There is and has been no failure on the part of the Company or any of the Company's directors or officers, in their capacities as such, to comply in all material respects with any provision of the Sarbanes-Oxley Act of 2002 and the rules and regulations promulgated in connection therewith (the "**Sarbanes-Oxley Act**"), including Section 402 related to loans and Sections 302 and 906 related to certifications.

(dd) Payment of Taxes. All United States federal income tax returns of the Company and its Subsidiaries required by law to be filed have been filed and all taxes shown by such returns or otherwise assessed, which are due and payable, have been paid, except assessments against which appeals have been or will be promptly taken and as to which adequate reserves have been provided. The Company and its Subsidiaries have filed all other tax returns that are required to have been filed by them pursuant to applicable foreign, state, local or other law except insofar as the failure to file such returns would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change, and has paid all taxes due pursuant to such returns or pursuant to any assessment received by the Company and its Subsidiaries, except for such taxes, if any, as are being contested in good faith and as to which adequate reserves have been established by the Company. The charges, accruals and reserves on the books of the Company in respect of any income and corporation tax liability for any years not finally determined are adequate to meet any assessments or re-assessments for additional income tax for any years not finally determined, except to the extent of any inadequacy that would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change.

(ee) Insurance. The Company and its Subsidiaries carry or are entitled to the benefits of insurance, with financially sound and reputable insurers, in such amounts and covering such risks as is generally maintained by similarly sized companies of established repute engaged in the same or similar business, and all such insurance is in full force and effect. The Company has no reason to believe that it or any of its Subsidiaries will not be able (A) to renew its existing insurance coverage as and when such policies expire or (B) to obtain comparable coverage from similar institutions as may be necessary or appropriate to conduct its business as now conducted and at a cost that would not reasonably be expected to, singly or in the aggregate, result in a Material Adverse Change. Neither of the Company nor any of its Subsidiaries has been denied any insurance coverage which it has sought or for which it has applied.

(ff) Investment Company Act. The Company is not required, and upon the issuance and sale of the Securities as herein contemplated and the application of the net proceeds therefrom as described in the Registration Statement and the Prospectus will not be required, to register as an "investment company" under the Investment Company Act of 1940, as amended (the "**1940 Act**").

(gg) Absence of Manipulation. None of the Company or any controlled affiliate, or to the Company's knowledge, any non-controlled affiliate, has taken, nor will the Company or any controlled affiliate, or to the Company's knowledge, any non-controlled affiliate, take, directly or indirectly, any action which is designed, or would be expected, to cause or result in, or which constitutes, the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of the Shares or to result in a violation of Regulation M under the Exchange Act.

(hh) Foreign Corrupt Practices Act. None of the Company, any of its Subsidiaries or, to the Company's knowledge, any director, officer, agent, employee, affiliate or other person acting on behalf of the Company or any of its Subsidiaries is aware of or has taken any action, directly or indirectly, that would result in a violation by such persons of the Foreign Corrupt Practices Act of 1977, as amended, and the rules and regulations thereunder (the "**FCPA**"), including, without limitation, making an offer, payment, promise to pay or authorization of the payment of any money, or other property, gift, promise to give, or authorization of the giving of anything of value to any "foreign official" (as such term is defined in the FCPA) or any foreign political party or official thereof

or any candidate for foreign political office, in contravention of the FCPA and the Company and, to the Company's knowledge, its affiliates have conducted their businesses in compliance with the FCPA and have instituted and maintain policies and procedures designed to ensure, and which are reasonably expected to continue to ensure, continued compliance therewith.

(ii) Money Laundering Laws. The operations of the Company and its Subsidiaries are and have been conducted at all times in compliance with applicable financial recordkeeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, the money laundering statutes of all applicable jurisdictions, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any Governmental Entity (collectively, the "**Money Laundering Laws**"); and no action, suit or proceeding by or before any Governmental Entity involving the Company or any of its Subsidiaries with respect to the Money Laundering Laws is pending or, to the best knowledge of the Company, threatened.

(jj) OFAC. None of the Company, any of its Subsidiaries or, to the Company's knowledge, any director, officer, agent, employee, affiliate or representative of the Company or any of its Subsidiaries is a Person currently the subject or target of any sanctions administered or enforced by the United States Government, including, without limitation, the U.S. Department of the Treasury's Office of Foreign Assets Control, the United Nations Security Council, the European Union, His Majesty's Treasury, or other relevant sanctions authority (collectively, "**Sanctions**"), nor is the Company located, organized or resident in a country or territory that is the subject of Sanctions, including, without limitation, Cuba, Iran, North Korea, Syria, the Crimea Region and the non-government controlled areas of the Zaporizhzhia and Kherson Regions of Ukraine, the so-called Donetsk People's Republic, the so-called Luhansk People's Republic and any other Covered Region of Ukraine identified pursuant to Executive Order 14065 (collectively, "**Sanctioned Countries**"); and the Company will not directly or indirectly use the proceeds of the sale of the Shares, or lend, contribute or otherwise make available such proceeds to any Subsidiaries, joint venture partners or other Person, to fund any activities of or business with any Person, or in any country or territory, that, at the time of such funding, is the subject of Sanctions or in any other manner that will result in a violation by any Person (including any Person participating in the transaction, whether as underwriter, advisor, investor or otherwise) of Sanctions. For the past ten years, the Company and its Subsidiaries have not knowingly engaged in and are not now knowingly engaged in any dealings or transactions with any Person that, at the time of the dealing or transaction, is or was the subject or the target of Sanctions or with any Sanctioned Country.

(kk) Lending Relationship. Except as disclosed in the Registration Statement and the Prospectus, the Company (i) does not have any material lending or other relationship with any bank or lending affiliate of the Agent and (ii) does not intend to use any of the proceeds from the sale of the Shares to repay any outstanding debt owed to any affiliate of the Agent.

(ll) Statistical and Market-Related Data. Any statistical and market-related data included in the Registration Statement or the Prospectus are based on or derived from sources that the Company believes, after reasonable inquiry, to be reliable and accurate and, to the extent required, the Company has obtained the written consent to the use of such data from such sources.

(mm) No Rated Securities. Neither the Company nor any of its Subsidiaries have any debt securities or preferred stock that are rated by any "nationally recognized statistical rating organization" (as defined in Section 3(a)(62) of the Exchange Act).

(nn) ERISA Compliance. Except as would not reasonably be expected to result in a Material Adverse Change: (a) the Company and its Subsidiaries and any "Employee Benefit Plan" (as defined under the Employee Retirement Income Security Act of 1974, as amended, and the regulations and published interpretations thereunder (collectively, "**ERISA**")) established or maintained by the Company, its Subsidiaries or their "ERISA Affiliates" (as defined below) (each, a "**Plan**") is and has been operated in compliance with its terms and all applicable laws, including ERISA and the Internal Revenue Code of 1986, as amended, and the regulations and published interpretations thereunder (the "**Code**"); (b) no "reportable event" (as defined under ERISA) has occurred or is reasonably expected to occur with respect to any Plan; (c) no Plan, if terminated, would have any "amount of unfunded benefit liabilities" (as defined under ERISA), as the fair market value of the assets under each Plan (excluding for these purposes accrued but unpaid contributions) exceeds the present value of all benefits accrued under such Plan (determined based on those assumptions used to fund such Plan); (d) neither the Company, its Subsidiaries nor any of their ERISA Affiliates has incurred or reasonably expects to incur any liability under (i) Title IV of ERISA with respect to termination of, or withdrawal from, any Plan, (ii) Sections 412 and 430, 4971, 4975 or 4980B of the Code or (iii) Sections 302 and 303, 406, 4063 and 4064 of ERISA; and (e) each Plan that is intended to be qualified under Section 401(a) of the Code is so qualified, and to the Company's knowledge, and nothing has occurred, whether by action or failure to act, that would reasonably be expected to cause the loss of such qualification. There is no pending audit or investigation by the Internal Revenue Service, the U.S. Department of Labor, the Pension Benefit Guaranty Corporation or any other governmental or other regulatory entity or agency with respect to any Plan that could reasonably be expected to result in liability to the Company or any of its Subsidiaries. Except as would not reasonably be expected to result in a Material Adverse Change, neither the Company nor any of its Subsidiaries have any "accumulated post-retirement benefit obligations" (within the meaning of Statement of Financial Accounting Standards 106). For the purposes of this Section 1(a)(xl), "ERISA Affiliate" means, with respect to the Company or any of its Subsidiaries, any member of any group of organizations described in Sections 414(b), (c), (m) or (o) of the Code of which the Company or such Subsidiary is a member.

(oo) Privacy and Data Protection. The Company and its Subsidiaries have operated their business in a manner compliant in all material respects with all United States federal, state, local and non-United States privacy, data security and data protection laws and regulations applicable to the Company's collection, use, transfer, protection, disposal, disclosure, handling, storage and analysis of personal data. The Company and its Subsidiaries have been and are in compliance in all material respects with internal policies and procedures designed to ensure the integrity and security of the data collected, handled or stored in connection with its business; the Company and its Subsidiaries have been and are in compliance in all material respects with internal policies and procedures designed to ensure compliance with the Health Care Laws that govern privacy and data security and take, and have taken reasonably appropriate steps designed to assure compliance in all material respects with such policies and procedures. The Company and its Subsidiaries have taken reasonable steps to maintain the confidentiality of its personally identifiable information, protected health information, consumer information and other confidential information of the Company, its Subsidiaries and any third parties in its possession ("**Sensitive Company Data**"). The tangible or digital information technology systems (including computers, screens, servers, workstations, routers, hubs, switches,

networks, data communications lines, technical data and hardware), software and telecommunications systems used or held for use by the Company and its Subsidiaries (the "**Company IT Assets**") are adequate and operational for, in accordance with their documentation and functional specifications, the business of the Company and its Subsidiaries as now operated and as currently proposed to be conducted as described in the Registration Statement and the Prospectus. The Company and its Subsidiaries have used reasonable efforts to establish, and have established, commercially reasonable disaster recovery and security plans, procedures and facilities for the business consistent with industry standards and practices in all material respects, including, without limitation, for the Company IT Assets and data held or used by or for the Company and its Subsidiaries. The Company and its Subsidiaries have not suffered or incurred any security breaches, compromises or incidents with respect to any Company IT Asset or Sensitive Company Data, except where such breaches, compromises or incidents would not, individually or in the aggregate, be material to the Company or any of its Subsidiaries; and there has been no unauthorized or illegal use of or access to any Company IT Asset or Sensitive Company Data by any unauthorized third party. The Company and its Subsidiaries have not been required to notify any individual of any information security breach, compromise or incident involving Sensitive Company Data.

(pp) Exchange Act Compliance. The Company is subject to and in compliance in all material respects with the reporting requirements of Section 13 or Section 15(d) of the Exchange Act. The Common Shares are registered pursuant to Section 12(b) of the Exchange Act and are listed on Nasdaq, and the Company has taken no action designed to, or reasonably likely to have the effect of, terminating the registration of the Common Shares under the Exchange Act or delisting the Common Shares from Nasdaq, nor has the Company received any notification that the Commission or Nasdaq is contemplating terminating such registration or listing. The Company is in compliance with the current listing standards of Nasdaq. The Company has filed a Notification of Listing of Additional Shares with Nasdaq with respect to the Shares.

(qq) Brokers. No person (as such term is defined in Rule 1-02 of Regulation S-X promulgated under the Securities Act) has the right to act as an underwriter or as a financial advisor to the Company in connection with the offer and sale of the Shares hereunder, whether as a result of the filing or effectiveness of the Registration Statement or the sale of the Shares as contemplated hereby or otherwise. Except for the Agent, there is no broker, finder or other party that is entitled to receive from the Company or any of its Subsidiaries any brokerage or finder's fee or other fee or commission as a result of any transactions contemplated by this Agreement.

(rr) Stock Transfer Taxes. There are no transfer taxes or other similar fees or charges under federal law, the laws of any state, any foreign law, or any political subdivision thereof, required to be paid in connection with the execution and delivery of this Agreement or the issuance by the Company or sale by the Company of the Shares.

(ss) Agent Purchases. The Company acknowledges and agrees that the Agent has informed the Company that the Agent may, to the extent permitted under the Securities Act and the Exchange Act, purchase and sell shares of Common Shares for its own account while this Agreement is in effect; *provided, that* (i) no such purchase or sales shall take place while a Issuance Notice is in effect (except to the extent the Agent may engage in sales of Shares purchased or deemed purchased from the Company as a "riskless principal" or in a similar capacity) and (ii) the Company shall not be deemed

to have authorized or consented to any such purchases or sales by the Agent, except as may be otherwise agreed by the Company and the Agent.

(tt) Underwriter Agreements. The Company is not a party to any agreement with an agent or underwriter for any other "at the market" or continuous equity transaction.

(uu) Broker/Dealer Relationships. The Company is not required to register as a "broker" or "dealer" in accordance with the provisions of the Exchange Act and does not, directly or indirectly through one or more intermediaries, control or have any other association with (within the meaning of Article I of the By-laws of FINRA) any member firm of FINRA. To the Company's knowledge, no relationship, direct or indirect, exists between or among the Company, on the one hand, and the directors, officers or shareholders of the Company, on the other hand, which is required by the rules of FINRA to be described in the Registration Statement and the Prospectus, which is not so described. All of the information (including, but not limited to, information regarding affiliations, security ownership and trading activity) provided to the Agent or its counsel by the Company in connection with the filing to be made and other supplemental information to be provided to FINRA pursuant to FINRA Rule 5110 in connection with the transactions contemplated by this Agreement is true, complete and correct.

(vv) Margin Rules. Neither the issuance, sale and delivery of the Shares nor the application of the proceeds thereof by the Company as described in the Registration Statement and the Prospectus will violate Regulation T, U or X of the Board of Governors of the Federal Reserve System or any other regulation of such Board of Governors.

(ww) Independence Standards. To the Company's knowledge, each of the independent directors (or independent director nominees, once appointed, if applicable) named in the Registration Statement and Prospectus satisfies the independence standards established by Nasdaq and, with respect to members of the Company's audit committee, the enhanced independence standards contained in Rule 10A-3(b)(1) promulgated by the Commission under the Exchange Act.

(xx) No Integration. Neither the Company nor, to the Company's knowledge, any of its affiliates (within the meaning of Rule 144 under the Securities Act) has, prior to the date hereof, made any offer or sale of any securities which could be "integrated" (within the meaning of the Securities Act) with the offer and sale of the Shares hereunder.

(yy) No Material Defaults. Neither the Company nor any of its Subsidiaries has (i) failed to pay any dividend or sinking fund installment on preferred stock or (ii) defaulted on any installment or payment due on indebtedness for borrowed money or on any rental on one or more long-term leases, which defaults, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change.

(zz) Forward-Looking Statements. Each "forward-looking statement" (as defined by Section 27A of the Securities Act or Section 21E of the Exchange Act) contained in the Registration Statement or the Prospectus (i) was so included by the Company in good faith and with reasonable basis and (ii) as required, is accompanied by meaningful cautionary statements identifying those factors that could cause actual results to differ materially from those in such forward-looking statement.

(aaa) Related Party Transactions. There are no relationships, direct or indirect, or related party transactions involving the Company or any of its Subsidiaries or any other person (including any director, officer, stockholder, customer or supplier of the Company or any of its Subsidiaries) required to be described in the Registration Statement or the Prospectus that have not been described as required. There are no material outstanding loans, advances (except normal advances for business expenses in the ordinary course of business) or guarantees of indebtedness by the Company or any of its Subsidiaries to or for the benefit of any of the officers or directors of the Company or any of its Subsidiaries, or any of the family members of any of such persons.

(bbb) No Bankruptcy or Insolvency. The Company is not in or subject to a bankruptcy or insolvency proceeding in any jurisdiction.

(ccc) Occupational Laws. The Company and its Subsidiaries (i) are in compliance, in all material respects, with any and all applicable foreign, federal, state and local laws, rules, regulations, treaties, statutes and codes promulgated by any and all governmental authorities (including pursuant to the Occupational Health and Safety Act) relating to the protection of human health and safety the workplace ("**Occupational Laws**"); (ii) have received all material permits, licenses or other approvals required of it under applicable Occupational Laws to conduct their respective businesses as currently conducted; and (iii) are in compliance, in all material respects, with all terms and conditions of such permit, license or approval. No action, proceeding, revocation proceeding, writ, injunction or claim is pending or, to the Company's knowledge, threatened against the Company or any of its Subsidiaries relating to Occupational Laws, and the Company does not have knowledge of any facts, circumstances or developments relating to its operations or cost accounting practices that could reasonably be expected to form the basis for or give rise to such actions, suits, investigations or proceedings.

Any certificate signed by any officer of the Company and delivered to the Agent or its counsel in connection with the offering of the Shares shall be deemed a representation and warranty by the Company, as to matters covered thereby, to the Agent.

The Company acknowledges that the Agent and, for purposes of the opinions to be delivered pursuant to Section 4(p) hereof, counsel to the Company and counsel to the Agent, will rely upon the accuracy and truthfulness of the foregoing representations and hereby consents to such reliance.

Section 3. ISSUANCE AND SALE OF COMMON SHARES

(a) Sale of Securities. On the basis of the representations, warranties and agreements herein contained, but subject to the terms and conditions herein set forth, the Company and the Agent agree that the Company may from time to time seek to sell Shares through the Agent, acting as sales agent, or directly to the Agent, acting as principal, as follows, with an aggregate Sales Price of up to the Maximum Program Amount, based on and in accordance with Issuance Notices as the Company may deliver, during the Agency Period.

(b) Mechanics of Issuances.

(i) Issuance Notice. Upon the terms and subject to the conditions set forth herein, on any Trading Day during the Agency Period on which the conditions set forth in Section 5(a) and Section 5(b) shall have been satisfied, the Company may exercise its right to request an issuance of Shares by delivering to the Agent an Issuance Notice; *provided,*

however, that (A) in no event may the Company deliver an Issuance Notice to the extent that the sum of (x) the aggregate Sales Price of the requested Issuance Amount, plus (y) the aggregate Sales Price of all Shares issued under all previous Issuance Notices effected pursuant to this Agreement, would exceed the Maximum Program Amount; and (B) prior to delivery of any Issuance Notice, the period set forth for any previous Issuance Notice shall have expired or been terminated. An Issuance Notice shall be considered delivered on the Trading Day that it is received by e-mail to the persons set forth in Schedule A hereto and confirmed by the Company by telephone (including a voicemail message to the persons so identified), with the understanding that, with adequate prior written notice, the Agent may modify the list of such persons from time to time.

(ii) Agent Efforts. Upon the terms and subject to the conditions set forth in this Agreement, upon the receipt of an Issuance Notice, the Agent will use its commercially reasonable efforts consistent with its normal sales and trading practices to place the Shares with respect to which the Agent has agreed to act as sales agent, subject to, and in accordance with the information specified in, the Issuance Notice, unless the sale of the Shares described therein has been suspended, cancelled or otherwise terminated in accordance with the terms of this Agreement. For the avoidance of doubt, the parties to this Agreement may modify an Issuance Notice at any time provided they both agree in writing to any such modification.

(iii) Method of Offer and Sale. The Shares may be offered and sold (A) in privately negotiated transactions with the consent of the Company; (B) as block transactions; or (C) by any other method permitted by law deemed to be an "at the market offering" as defined in Rule 415(a)(4) under the Securities Act, including sales made directly on Nasdaq or sales made into any other existing trading market of the Common Shares. Nothing in this Agreement shall be deemed to require either party to agree to the method of offer and sale specified in the preceding sentence, and (except as specified in clauses (A) and (B) above) the method of placement of any Shares by the Agent shall be at the Agent's discretion.

(iv) Confirmation to the Company. If acting as sales agent hereunder, the Agent will provide written confirmation to the Company no later than the opening of the Trading Day next following the Trading Day on which it has placed Shares hereunder setting forth the number of shares sold on such Trading Day, the corresponding Sales Price and the Issuance Price payable to the Company in respect thereof.

(v) Settlement. Each issuance of Shares will be settled on the applicable Settlement Date for such issuance of Shares and, subject to the provisions of Section 5, on or before each Settlement Date, the Company will, or will cause its transfer agent to, electronically transfer the Shares being sold by crediting the Agent or its designee's account at The Depository Trust Company through its Deposit/Withdrawal At Custodian (DWAC) System, or by such other means of delivery as may be mutually agreed upon by the parties hereto and, upon receipt of such Shares, which in all cases shall be freely tradable, transferable, registered shares in good deliverable form, the Agent will deliver, by wire transfer of immediately available funds, the related Issuance Price in same day funds delivered to an account designated by the Company prior to the Settlement Date. The Company may sell Shares to the Agent as principal at a price agreed upon by the parties at each relevant time Shares are sold pursuant to this Agreement (each, a "Time of Sale").

(vi) Suspension or Termination of Sales. Consistent with standard market settlement practices, the Company or the Agent may, upon notice to the other party hereto in writing or by telephone (confirmed immediately by verifiable email), suspend any sale of Shares, and the period set forth in an Issuance Notice shall immediately terminate; *provided, however*, that (A) such suspension and termination shall not affect or impair either party's obligations with respect to any Shares placed or sold hereunder prior to the receipt of such notice; (B) if the Company suspends or terminates any sale of Shares after the Agent confirms such sale to the Company, the Company shall still be obligated to comply with Section 3(b)(v) with respect to such Shares; and (C) if the Company defaults in its obligation to deliver Shares on a Settlement Date, the Company agrees that it will hold the Agent harmless against any loss, claim, damage or expense (including, without limitation, penalties, interest and reasonable legal fees and expenses), as incurred, arising out of or in connection with such default by the Company. The parties hereto acknowledge and agree that, in performing its obligations under this Agreement, the Agent may borrow Common Shares from stock lenders in the event that the Company has not delivered Shares to settle sales as required by subsection (v) above, and may use the Shares to settle or close out such borrowings. The Company agrees that no such notice shall be effective against the Agent unless it is made to the persons identified in writing by the Agent pursuant to Section 3(b)(i).

(vii) No Guarantee of Placement, Etc. The Company acknowledges and agrees that (A) there can be no assurance that the Agent will be successful in placing Shares; (B) the Agent will incur no liability or obligation to the Company or any other Person if it does not sell Shares; and (C) the Agent shall be under no obligation to purchase Shares on a principal basis pursuant to this Agreement, except as otherwise specifically agreed by the Agent and the Company.

(viii) Material Non-Public Information. Notwithstanding any other provision of this Agreement, the Company and the Agent agree that the Company shall not deliver any Issuance Notice to the Agent, and the Agent shall not be obligated to place any Shares, during any period in which the Company is in possession of material non-public information.

(c) Fees. As compensation for services rendered, the Company shall pay to the Agent, on the applicable Settlement Date, the Selling Commission for the applicable Issuance Amount (including with respect to any suspended or terminated sale pursuant to Section 3(b)(vi)) by the Agent deducting the Selling Commission from the applicable Issuance Amount.

(d) Expenses. The Company agrees to pay all costs, fees and expenses incurred in connection with the performance of its obligations hereunder and in connection with the transactions contemplated hereby, including without limitation (i) all expenses incident to the issuance and delivery of the Shares (including all printing and engraving costs); (ii) all fees and expenses of the registrar and transfer agent of the Shares; (iii) all necessary issue, transfer and other stamp taxes in connection with the issuance and sale of the Shares; (iv) all fees and expenses of the Company's counsel, independent public or certified public accountants and other advisors; (v) all costs and expenses incurred in connection with the preparation, printing, filing, shipping and distribution of the Registration Statement (including financial statements, exhibits, schedules, consents and certificates of experts), the Prospectus, any Free Writing Prospectus (as defined below) prepared by or on behalf of, used by, or referred to by the Company, and all amendments and supplements thereto, and this

Agreement; (vi) all filing fees, attorneys' fees and expenses incurred by the Company or the Agent in connection with qualifying or registering (or obtaining exemptions from the qualification or registration of) all or any part of the Shares for offer and sale under the state securities or blue sky laws or the provincial securities laws of Canada, and, if requested by the Agent, preparing and printing a "**Blue Sky Survey**" or memorandum and a "Canadian wrapper," and any supplements thereto, advising the Agent of such qualifications, registrations, determinations and exemptions; (vii) the reasonable fees and disbursements of the Agent's counsel, including the reasonable fees and expenses of counsel for the Agent in connection with FINRA review, if any, and approval of the Agent's participation in the offering and distribution of the Shares; (viii) the filing fees incident to FINRA review, if any; (ix) the costs and expenses of the Company relating to investor presentations on any "road show" undertaken in connection with the marketing of the offering of the Shares, including, without limitation, expenses associated with the preparation or dissemination of any electronic road show, expenses associated with the production of road show slides and graphics, fees and expenses of any consultants engaged in connection with the road show presentations with the prior approval of the Company, travel and lodging expenses of the representatives, employees and officers of the Company and of the Agent and any such consultants, and the cost of any aircraft chartered in connection with the road show; and (x) the fees and expenses associated with listing the Shares on Nasdaq. The reasonable and documented fees and disbursements of Agent's counsel pursuant to subsections (vi) and (vii) above shall not exceed, in the aggregate, (A) $75,000 in connection with the execution of the Agreement; (B) $25,000 in connection with each Triggering Event Date (as defined below) on which the Company is required to provide a certificate pursuant to Sections 4(o)(ii) and (C) $15,000 in connection with each Triggering Event Date on which the Company is required to provide a certificate pursuant to Sections 4(o)(i), (iii) and (iv).

Section 4. ADDITIONAL COVENANTS

The Company covenants and agrees with the Agent as follows, in addition to any other covenants and agreements made elsewhere in this Agreement:

(a) Exchange Act Compliance. During the Agency Period, the Company shall (i) file, on a timely basis, with the Commission all reports and documents required to be filed under Section 13, 14 or 15 of the Exchange Act in the manner and within the time periods required by the Exchange Act; and (ii) either (A) include in its quarterly reports on Form 10-Q and its annual reports on Form 10-K, a summary detailing, for the relevant reporting period, (1) the number of Shares sold through the Agent pursuant to this Agreement and (2) the net proceeds received by the Company from such sales or (B) prepare a prospectus supplement containing, or include in such other filing permitted by the Securities Act or Exchange Act (each an "**Interim Prospectus Supplement**"), such summary information and, at least once a quarter and subject to this Section 4, file such Interim Prospectus Supplement pursuant to Rule 424(b) under the Securities Act (and within the time periods required by Rule 424(b) and Rule 430B under the Securities Act).

(b) Securities Act Compliance. After the date of this Agreement, the Company shall promptly advise the Agent in writing (i) of the receipt of any comments of, or requests for additional or supplemental information from, the Commission; (ii) of the time and date of any filing of any post-effective amendment to the Registration Statement, any Rule 462(b) Registration Statement or any amendment or supplement to the Prospectus or any Free Writing Prospectus; (iii) of the time and date that any post-effective amendment to the Registration Statement or any Rule 462(b) Registration

Statement becomes effective; and (iv) of the issuance by the Commission of any stop order suspending the effectiveness of the Registration Statement or any post-effective amendment thereto, any Rule 462(b) Registration Statement or any amendment or supplement to the Prospectus or of any order preventing or suspending the use of any Free Writing Prospectus or the Prospectus, or of any proceedings to remove, suspend or terminate from listing or quotation the Common Shares from any securities exchange upon which they are listed for trading or included or designated for quotation, or of the threatening or initiation of any proceedings for any of such purposes. If the Commission shall enter any such stop order at any time, the Company will use its reasonable efforts to obtain the lifting of such order as soon as practicable. Additionally, the Company agrees that it shall comply with the provisions of Rule 424(b) and Rule 433, as applicable, under the Securities Act and will use its reasonable efforts to confirm that any filings made by the Company under such Rule 424(b) or Rule 433 were received in a timely manner by the Commission.

(c) Amendments and Supplements to the Prospectus and Other Securities Act Matters. If any event shall occur or condition exist as a result of which it is necessary to amend or supplement the Prospectus so that the Prospectus does not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in light of the circumstances when the Prospectus is delivered to a purchaser, not misleading, or if in the opinion of the Agent or counsel for the Agent it is otherwise necessary to amend or supplement the Prospectus to comply with applicable law, including the Securities Act, the Company agrees (subject to Section 4(d) and 4(f)) to promptly prepare, file with the Commission and furnish at its own expense to the Agent, amendments or supplements to the Prospectus so that the statements in the Prospectus as so amended or supplemented will not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in light of the circumstances when the Prospectus is delivered to a purchaser, not misleading or so that the Prospectus, as amended or supplemented, will comply with applicable law including the Securities Act. Neither the Agent's consent to, or delivery of, any such amendment or supplement shall constitute a waiver of any of the Company's obligations under Sections 4(d) and 4(f).

(d) Agent's Review of Proposed Amendments and Supplements. Prior to amending or supplementing the Registration Statement (including any Rule 462(b) Registration Statement) or the Prospectus (excluding any amendment or supplement through incorporation of any report filed under the Exchange Act), the Company shall furnish to the Agent for review, a reasonable amount of time prior to the proposed time of filing or use thereof, a copy of each such proposed amendment or supplement, and, if such proposed amendment or supplement relates to the matters contemplated by this Agreement, the Company shall not file or use any such proposed amendment or supplement without the Agent's prior consent, and to file with the Commission within the applicable period specified in Rule 424(b) under the Securities Act any prospectus required to be filed pursuant to such Rule.

(e) Use of Free Writing Prospectus. Neither the Company nor the Agent has prepared, used, referred to or distributed, or will prepare, use, refer to or distribute, without the other party's prior written consent, any "written communication" that constitutes a "free writing prospectus" as such terms are defined in Rule 405 under the Securities Act with respect to the offering contemplated by this Agreement (any such free writing prospectus being referred to herein as a "**Free Writing Prospectus**").

(f) Free Writing Prospectuses. The Company shall furnish to the Agent for review, a reasonable amount of time prior to the proposed time of filing or use thereof, a copy of each proposed Free Writing Prospectus or any amendment or supplement thereto to be prepared by or on behalf of, used by, or referred to by the Company and the Company shall not file, use or refer to any proposed Free Writing Prospectus or any amendment or supplement thereto without the Agent's consent. The Company shall furnish to the Agent, without charge, as many copies of any Free Writing Prospectus prepared by or on behalf of, or used by the Company, as the Agent may reasonably request. If at any time when a prospectus is required by the Securities Act (including, without limitation, pursuant to Rule 173(d)) to be delivered in connection with sales of the Shares (but in any event if at any time through and including the date of this Agreement) there occurred or occurs an event or development as a result of which any Free Writing Prospectus prepared by or on behalf of, used by, or referred to by the Company conflicted or would conflict with the information contained in the Registration Statement or included or would include an untrue statement of a material fact or omitted or would omit to state a material fact necessary in order to make the statements therein, in light of the circumstances prevailing at that subsequent time, not misleading, the Company shall promptly amend or supplement such Free Writing Prospectus to eliminate or correct such conflict or so that the statements in such Free Writing Prospectus as so amended or supplemented will not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in light of the circumstances prevailing at such subsequent time, not misleading, as the case may be; *provided, however*, that prior to amending or supplementing any such Free Writing Prospectus, the Company shall furnish to the Agent for review, a reasonable amount of time prior to the proposed time of filing or use thereof, a copy of such proposed amended or supplemented Free Writing Prospectus and the Company shall not file, use or refer to any such amended or supplemented Free Writing Prospectus without the Agent's consent.

(g) Filing of Agent Free Writing Prospectuses. The Company shall not take any action that would result in the Agent or the Company being required to file with the Commission pursuant to Rule 433(d) under the Securities Act a Free Writing Prospectus prepared by or on behalf of the Agent that the Agent otherwise would not have been required to file thereunder.

(h) Copies of Registration Statement and Prospectus. After the date of this Agreement through the last time that a prospectus is required by the Securities Act (including, without limitation, pursuant to Rule 173(d)) to be delivered in connection with sales of the Shares, the Company agrees to furnish the Agent with copies (which may be electronic copies) of the Registration Statement and each amendment thereto, and with copies of the Prospectus and each amendment or supplement thereto in the form in which it is filed with the Commission pursuant to the Securities Act or Rule 424(b) under the Securities Act, both in such quantities as the Agent may reasonably request from time to time; and, if the delivery of a prospectus is required under the Securities Act or under the blue sky or securities laws of any jurisdiction at any time on or prior to the applicable Settlement Date for any period set forth in an Issuance Notice in connection with the offering or sale of the Shares and if at such time any event has occurred as a result of which the Prospectus as then amended or supplemented would include an untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in light of the circumstances under which they were made when such Prospectus is delivered, not misleading, or, if for any other reason it is necessary during such same period to amend or supplement the Prospectus or to file under the Exchange Act any document incorporated by reference in the Prospectus in order to comply with the Securities Act or the Exchange Act, to notify the Agent and to request that the Agent suspend offers to sell Shares (and,

if so notified, the Agent shall cease such offers as soon as practicable); and if the Company decides to amend or supplement the Registration Statement or the Prospectus as then amended or supplemented, to advise the Agent promptly by telephone (with confirmation in writing) and to prepare and cause to be filed promptly with the Commission an amendment or supplement to the Registration Statement or the Prospectus as then amended or supplemented that will correct such statement or omission or effect such compliance; *provided, however*, that if during such same period the Agent is required to deliver a prospectus in respect of transactions in the Shares, the Company shall promptly prepare and file with the Commission such an amendment or supplement.

(i) Blue Sky Compliance. The Company shall cooperate with the Agent and counsel for the Agent to qualify or register the Shares for sale under (or obtain exemptions from the application of) the state securities or blue sky laws or Canadian provincial securities laws (or other foreign laws) of those jurisdictions designated by the Agent, shall comply with such laws and shall continue such qualifications, registrations and exemptions in effect so long as required for the distribution of the Shares. The Company shall not be required to qualify as a foreign corporation or to take any action that would subject it to general service of process in any such jurisdiction where it is not presently qualified or where it would be subject to taxation as a foreign corporation. The Company will advise the Agent promptly of the suspension of the qualification or registration of (or any such exemption relating to) the Shares for offering, sale or trading in any jurisdiction or any initiation or threat of any proceeding for any such purpose, and in the event of the issuance of any order suspending such qualification, registration or exemption, the Company shall use its reasonable efforts to obtain the withdrawal thereof as soon as practicable.

(j) Earnings Statement. As soon as practicable, the Company will make generally available to its security holders and to the Agent an earnings statement (which need not be audited) covering a period of at least twelve months beginning with the first fiscal quarter of the Company occurring after the date of this Agreement which shall satisfy the provisions of Section 11(a) of the Securities Act and Rule 158 under the Securities Act.

(k) Listing; Reservation of Shares. (a) The Company will maintain the listing of the Shares on Nasdaq; and (b) the Company will reserve and keep available at all times, free of preemptive rights, Shares for the purpose of enabling the Company to satisfy its obligations under this Agreement.

(l) Transfer Agent. The Company shall engage and maintain, at its expense, a registrar and transfer agent for the Shares.

(m) Due Diligence. During the term of this Agreement, the Company will reasonably cooperate with any reasonable due diligence review conducted by the Agent in connection with the transactions contemplated hereby, including, without limitation, providing information and making available documents and senior corporate officers, during normal business hours and at the Company's principal offices or virtually, as the Agent may reasonably request from time to time.

(n) Representations and Warranties. The Company acknowledges that each delivery of an Issuance Notice and each delivery of Shares on a Settlement Date shall be deemed to be (i) an affirmation to the Agent that the representations and warranties of the Company contained in or made pursuant to this Agreement are true and correct as of the date of such Issuance Notice or of such Settlement Date, as the case may be, as though made at and as of each such date, except as may be

disclosed in the Prospectus (including any documents incorporated by reference therein and any supplements thereto); and (ii) an undertaking that the Company will advise the Agent if any of such representations and warranties will not be true and correct as of the Settlement Date for the Shares relating to such Issuance Notice, as though made at and as of each such date (except that such representations and warranties shall be deemed to relate to the Registration Statement and the Prospectus as amended and supplemented relating to such Shares).

(o) Deliverables at Triggering Event Dates; Certificates. The Company agrees that on or prior to the date of the first Issuance Notice and, during the term of this Agreement after the date of the first Issuance Notice, upon:

(i) the filing of the Prospectus or the amendment or supplement of any Registration Statement or Prospectus (other than a prospectus supplement relating solely to an offering of securities other than the Shares or a prospectus filed pursuant to Section 4(a)(ii)(B)), by means of a post-effective amendment, sticker or supplement, but not by means of incorporation of documents by reference into the Registration Statement or Prospectus;

(ii) the filing with the Commission of an annual report on Form 10-K (including any Form 10-K/A containing amended financial information or a material amendment to the previously filed annual report on Form 10-K of the Company;

(iii) the filing with the Commission of a quarterly report on Form 10-Q (including any Form 10-Q/A containing amended financial information or a material amendment to the previously filed quarterly report on Form 10-Q) of the Company; or

(iv) the filing with the Commission of a current report on Form 8-K of the Company (i) containing amended financial information (other than information "furnished" pursuant to Item 2.02 or 7.01 of Form 8-K or to provide disclosure pursuant to Item 8.01 of Form 8-K relating to reclassification of certain properties as discontinued operations in accordance with Statement of Financial Accounting Standards No. 144) and/or (ii) disclosing any material transaction requiring the filing of historical or pro forma financial statements under Item 9.01 of Form 8-K and subject to the guidance set forth in Section 2050.3 of the Financial Reporting Manual of the Commission which is material to the offering of securities of the Company in the Agent's reasonable discretion;

(any such event, a "**Triggering Event Date**"), the Company shall furnish the Agent (but in the case of clause (iv) above only if the Agent reasonably determines that the information contained in such current report on Form 8-K of the Company is material) with a certificate as of the Triggering Event Date, in the form and substance satisfactory to the Agent and its counsel, substantially similar to the form previously provided to the Agent and its counsel, modified, as necessary, to relate to the Registration Statement and the Prospectus as amended or supplemented, (A) confirming that the representations and warranties of the Company contained in this Agreement are true and correct, (B) confirming that the Company has performed all of its obligations hereunder to be performed on or prior to the date of such certificate and as to the matters set forth in Section 5(a)(iii) hereof, and (C) containing any other certification that the Agent shall reasonably request. The requirement to provide a certificate under this Section 4(o) shall be waived for any Triggering Event Date occurring at a time when no Issuance Notice is pending or a suspension is in effect, which waiver shall continue until the

earlier to occur of the date the Company delivers instructions for the sale of Shares hereunder (which for such calendar quarter shall be considered a Triggering Event Date) and the next occurring Triggering Event Date. Notwithstanding the foregoing, if the Company subsequently decides to sell Shares following a Triggering Event Date when a suspension was in effect and did not provide the Agent with a certificate under this Section 4(o), then before the Company delivers the instructions for the sale of Shares or the Agent sells any Shares pursuant to such instructions, the Company shall provide the Agent with a certificate in conformity with this Section 4(o) dated as of the date that the instructions for the sale of Shares are issued.

(p) Legal Opinions. On or prior to the date of the first Issuance Notice and on or prior to each Triggering Event Date with respect to which the Company is obligated to deliver a certificate pursuant to Section 4(o) for which no waiver is applicable and excluding the date of this Agreement, a negative assurances letter and the written legal opinion of Cooley LLP, counsel to the Company, Paul Hastings LLP, counsel to the Agent, and Jones Day, intellectual property counsel to the Company, each dated the date of delivery, in form and substance reasonably satisfactory to Agent and its counsel, substantially similar to the form previously provided to the Agent and its counsel, modified, as necessary, to relate to the Registration Statement and the Prospectus as then amended or supplemented. In lieu of such opinions for subsequent periodic filings, in the discretion of the Agent, the Company may furnish a reliance letter from such counsel to the Agent, permitting the Agent to rely on a previously delivered opinion letter, modified as appropriate for any passage of time or Triggering Event Date (except that statements in such prior opinion shall be deemed to relate to the Registration Statement and the Prospectus as amended or supplemented as of such Triggering Event Date).

(q) Comfort Letter. On or prior to the date of the first Issuance Notice and on or prior to each Triggering Event Date with respect to which the Company is obligated to deliver a certificate pursuant to Section 4(o) for which no waiver is applicable and excluding the date of this Agreement, the Company shall cause PwC Wirtschaftsprüfung GmbH, the independent registered public accounting firm who has audited or reviewed the financial statements included or incorporated by reference in the Registration Statement, to furnish the Agent a comfort letter, dated the date of delivery, in form and substance reasonably satisfactory to the Agent and its counsel, substantially similar to the form previously provided to the Agent and its counsel; *provided, however*, that any such comfort letter will only be required on the Triggering Event Date specified to the extent that it contains financial statements filed with the Commission under the Exchange Act and incorporated or deemed to be incorporated by reference into a Prospectus. If requested by the Agent, the Company shall also cause a comfort letter to be furnished to the Agent within ten (10) Trading Days of the date of occurrence of any material transaction or event requiring the filing of a current report on Form 8-K containing material amended financial information of the Company, including the restatement of the Company's financial statements.

(r) Secretary's Certificate. On or prior to the date of the first Issuance Notice and on or prior to each Triggering Event Date, the Company shall furnish the Agent a certificate executed by the Secretary of the Company, signing in such capacity, dated the date of delivery (i) certifying that attached thereto are true and complete copies of the resolutions duly adopted by the Board of Directors of the Company authorizing the execution and delivery of this Agreement and the consummation of the transactions contemplated hereby (including, without limitation, the issuance of the Shares pursuant to this Agreement), which authorization shall be in full force and effect on and as of the date

of such certificate, (ii) certifying and attesting to the office, incumbency, due authority and specimen signatures of each Person who executed this Agreement for or on behalf of the Company, and (iii) containing any other certification that the Agent shall reasonably request.

(s) Agent's Own Account; Clients' Account. The Company consents to the Agent trading, in compliance with applicable law, in the Common Shares for the Agent's own account and for the account of its clients at the same time as sales of the Shares occur pursuant to this Agreement.

(t) Investment Limitation. The Company shall not invest, or otherwise use the proceeds received by the Company from its sale of the Shares in such a manner as would require the Company or any of its subsidiaries to register as an investment company under the 1940 Act.

(u) Market Activities. The Company has not taken, and will not take, directly or indirectly, any action designed to or that might be reasonably expected to cause or result in stabilization or manipulation of the price of the Shares or any other reference security, whether to facilitate the sale or resale of the Shares or otherwise, and the Company will, and shall cause each of its Affiliates to, comply with all applicable provisions of Regulation M. If the limitations of Rule 102 of Regulation M ("**Rule 102**") do not apply with respect to the Shares or any other reference security pursuant to any exception set forth in Section (d) of Rule 102, then promptly upon notice from the Agent (or, if later, at the time stated in the notice), the Company will, and shall cause each of its Affiliates to, comply with Rule 102 as though such exception were not available but the other provisions of Rule 102 (as interpreted by the Commission) did apply. The Company shall promptly notify the Agent if it no longer meets the requirements set forth in Section (d) of Rule 102.

(v) Notice of Other Sale. Without the written consent of the Agent, the Company will not, directly or indirectly, offer to sell, sell, contract to sell, grant any option to sell or otherwise dispose of any Common Shares or securities convertible into or exchangeable for Common Shares (other than Shares hereunder), warrants or any rights to purchase or acquire Common Shares, or effect a reverse stock split, recapitalization, share consolidation, reclassification or similar transaction affecting the outstanding Common Shares, during the period beginning on the third Trading Day immediately prior to the date on which any Issuance Notice is delivered to the Agent hereunder and ending on the third Trading Day immediately following the Settlement Date with respect to Shares sold pursuant to such Issuance Notice; and will not directly or indirectly enter into any other "at the market" or continuous equity transaction to offer to sell, sell, contract to sell, grant any option to sell or otherwise dispose of any Common Shares (other than the Shares offered pursuant to this Agreement) or securities convertible into or exchangeable for Common Shares, warrants or any rights to purchase or acquire, Common Shares prior to the termination of this Agreement; provided, however, that such restrictions will not be required in connection with the Company's (i) offer, issuance or sale of Common Shares, options to purchase Common Shares or Common Shares issuable upon the exercise of options or other equity awards pursuant to any employee or director share option, incentive or benefit plan, share purchase or ownership plan, long-term incentive plan, dividend reinvestment plan, inducement award under the rules of Nasdaq or other compensation plan of the Company or its subsidiaries, as in effect on the date of this Agreement, (ii) offer, issuance or sale of Common Shares issuable upon exchange, conversion or redemption of securities or the exercise or vesting of warrants, options or other equity awards outstanding at the date of this Agreement, and (iii) modification of any outstanding options, warrants of any rights to purchase or acquire Common Shares.

(w) The Company will promptly notify the Agent if the Company ceases to be an Emerging Growth Company.

Section 5. CONDITIONS TO DELIVERY OF ISSUANCE NOTICES AND TO SETTLEMENT

(a) Conditions Precedent to the Right of the Company to Deliver an Issuance Notice and the Obligation of the Agent to Sell Shares. The right of the Company to deliver an Issuance Notice hereunder is subject to the satisfaction, on the date of delivery of such Issuance Notice, and the obligation of the Agent to use its commercially reasonable efforts to place Shares during the applicable period set forth in the Issuance Notice is subject to the satisfaction, on each Trading Day during the applicable period set forth in the Issuance Notice, of each of the following conditions:

(i) Accuracy of the Company's Representations and Warranties; Performance by the Company. The representations and warranties of the Company contained in this Agreement are true and correct as of the date of the Issuance Notice (other than representations and warranties made as of a specific date that shall be true and correct as of such date), and the Company shall have delivered the certificate required to be delivered pursuant to Section 4(o) on or before the date on which delivery of such certificate is required pursuant to Section 4(o). The Company shall have performed, satisfied and complied with all covenants, agreements and conditions required by this Agreement to be performed, satisfied or complied with by the Company at or prior to such date, including, but not limited to, the covenants contained in Section 4(p), Section 4(q) and Section 4(r).

(ii) No Injunction. No statute, rule, regulation, executive order, decree, ruling or injunction shall have been enacted, entered, promulgated or endorsed by any court or governmental authority of competent jurisdiction or any self-regulatory organization having authority over the matters contemplated hereby that prohibits or directly and materially adversely affects any of the transactions contemplated by this Agreement, and no proceeding shall have been commenced that may have the effect of prohibiting or materially adversely affecting any of the transactions contemplated by this Agreement.

(iii) Material Adverse Changes. Except as disclosed in the Prospectus, (a) in the judgment of the Agent there shall not have occurred any Material Adverse Change; and (b) there shall not have occurred any downgrading, nor shall any notice have been given of any intended or potential downgrading or of any review for a possible change that does not indicate the direction of the possible change, in the rating accorded any securities of the Company or any of its subsidiaries by any "nationally recognized statistical rating organization" as such term is defined for purposes of Section 3(a)(62) of the Exchange Act.

(iv) No Suspension of Trading in or Delisting of Common Shares; Other Events. The trading of the Common Shares (including without limitation the Shares) shall not have been suspended by the Commission, Nasdaq or FINRA and the Common Shares (including without limitation the Shares) shall have been approved for listing or quotation on and shall not have been delisted from the Nasdaq Stock Market, the New

York Stock Exchange or any of their constituent markets. There shall not have occurred (and be continuing in the case of occurrences under clauses (i) and (ii) below) any of the following: (i) trading or quotation in any of the Company's securities shall have been suspended or limited by the Commission or by Nasdaq or trading in securities generally on Nasdaq either shall have been suspended or limited, or minimum or maximum prices shall have been generally established on any of such stock exchanges by the Commission or FINRA; (ii) a general banking moratorium shall have been declared by any of federal or New York, authorities; or (iii) there shall have occurred any outbreak or escalation of national or international hostilities or any crisis or calamity, or any change in the United States or international financial markets, or any substantial change or development involving a prospective substantial change in United States' or international political, financial or economic conditions, as in the judgment of the Agent is material and adverse and makes it impracticable to market the Shares in the manner and on the terms described in the Prospectus or to enforce contracts for the sale of securities.

(b) Documents Required to be Delivered on each Issuance Notice Date. The Agent's obligation to use its commercially reasonable efforts to place Shares hereunder shall additionally be conditioned upon the delivery to the Agent on or before the Issuance Notice Date of a certificate in form and substance reasonably satisfactory to the Agent, executed by the Chief Executive Officer, President or Chief Financial Officer of the Company, to the effect that all conditions to the delivery of such Issuance Notice shall have been satisfied as at the date of such certificate (which certificate shall not be required if the foregoing representations shall be set forth in the Issuance Notice).

(c) No Misstatement or Material Omission. The Agent shall not have advised the Company that the Registration Statement, the Prospectus or any amendment or supplement thereto, contains an untrue statement of fact that in the Agent's reasonable opinion is material, or omits to state a fact that in the Agent's reasonable opinion is material and is required to be stated therein or is necessary to make the statements therein not misleading.

Section 6. INDEMNIFICATION AND CONTRIBUTION

(a) Indemnification of the Agent. The Company agrees to indemnify and hold harmless the Agent, its officers and employees, and each person, if any, who controls the Agent within the meaning of the Securities Act or the Exchange Act against any loss, claim, damage, liability or expense, as incurred, to which the Agent or such officer, employee or controlling person may become subject, under the Securities Act, the Exchange Act, other federal or state statutory law or regulation, or the laws or regulations of foreign jurisdictions where Shares have been offered or sold or at common law or otherwise (including in settlement of any litigation), insofar as such loss, claim, damage, liability or expense (or actions in respect thereof as contemplated below) arises out of or is based upon (i) any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, or any amendment thereto, including any information deemed to be a part thereof pursuant to Rule 430B under the Securities Act, or the omission or alleged omission therefrom of a material fact required to be stated therein or necessary to make the statements therein not misleading; (ii) any untrue statement or alleged untrue statement of a material fact contained in any Free Writing Prospectus that the Company has used, referred to or filed, or is required to file, pursuant to Rule 433(d) of the Securities Act or the Prospectus (or any amendment or supplement thereto), or the

omission or alleged omission therefrom of a material fact necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading; or (iii) any act or failure to act or any alleged act or failure to act by the Agent in connection with, or relating in any manner to, the Common Shares or the offering contemplated hereby, and which is included as part of or referred to in any loss, claim, damage, liability or action arising out of or based upon any matter covered by clause (i) or (ii) above, provided that the Company shall not be liable under this clause (iii) to the extent that a court of competent jurisdiction shall have determined by a final judgment that such loss, claim, damage, liability or action resulted directly from any such acts or failures to act undertaken or omitted to be taken by the Agent through its bad faith or willful misconduct, and to reimburse the Agent and each such officer, employee and controlling person for any and all expenses (including the reasonable and documented fees and disbursements of counsel chosen by the Agent) as such expenses are reasonably incurred by the Agent or such officer, employee or controlling person in connection with investigating, defending, settling, compromising or paying any such loss, claim, damage, liability, expense or action; provided, however, that the foregoing indemnity agreement shall not apply to any loss, claim, damage, liability or expense to the extent, but only to the extent, arising out of or based upon any untrue statement or alleged untrue statement or omission or alleged omission made in reliance upon and in conformity with written information furnished to the Company by the Agent expressly for use in the Registration Statement, any such Free Writing Prospectus or the Prospectus (or any amendment or supplement thereto), it being understood and agreed that the only such information furnished by the Agent to the Company consists of the first sentence of the ninth paragraph under the caption "Plan of Distribution" in the Prospectus (the "**Agent's Information**"). The indemnity agreement set forth in this Section 6(a) shall be in addition to any liabilities that the Company may otherwise have.

(b) Indemnification of the Company, its Directors and Officers. The Agent agrees to indemnify and hold harmless the Company, each of its directors, each of its officers who signed the Registration Statement and each person, if any, who controls the Company within the meaning of the Securities Act or the Exchange Act against any loss, claim, damage, liability or expense, as incurred, to which the Company or any such director, officer or controlling person may become subject, under the Securities Act, the Exchange Act, or other federal or state statutory law or regulation, or the laws or regulations of foreign jurisdictions where Shares have been offered or sold or at common law or otherwise (including in settlement of any litigation), insofar as such loss, claim, damage, liability or expense arises out of or is based upon (i) any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, or any amendment thereto, including any information deemed to be a part thereof pursuant to Rule 430B under the Securities Act, or the omission or alleged omission therefrom of a material fact required to be stated therein or necessary to make the statements therein not misleading; or (ii) any untrue statement or alleged untrue statement of a material fact contained in any Free Writing Prospectus that the Company has used, referred to or filed, or is required to file, pursuant to Rule 433(d) of the Securities Act or the Prospectus (or any amendment or supplement thereto), or the omission or alleged omission therefrom of a material fact necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading; but, for each of (i) and (ii) above, only to the extent arising out of or based upon any untrue statement or alleged untrue statement or omission or alleged omission made in reliance upon and in conformity with written information furnished to the Company by the Agent expressly for use in the Registration Statement, any such Free Writing Prospectus or the Prospectus (or any amendment or supplement thereto), it being understood and agreed that the only such information furnished by the Agent to the Company consists of the Agent's Information, and to reimburse the Company and each

such director, officer and controlling person for any and all expenses (including the reasonable and documented fees and disbursements of one counsel chosen by the Company) as such expenses are reasonably incurred by the Company or such officer, director or controlling person in connection with investigating, defending, settling, compromising or paying any such loss, claim, damage, liability, expense or action. The indemnity agreement set forth in this Section 6(b) shall be in addition to any liabilities that the Agent may otherwise have.

(c) Notifications and Other Indemnification Procedures. Promptly after receipt by an indemnified party under this Section 6 of notice of the commencement of any action, such indemnified party will, if a claim in respect thereof is to be made against an indemnifying party under this Section 6, notify the indemnifying party in writing of the commencement thereof, but the omission so to notify the indemnifying party will not relieve it from any liability which it may have to any indemnified party for contribution or otherwise than under the indemnity agreement contained in this Section 6 or to the extent it is not prejudiced as a proximate result of such failure. In case any such action is brought against any indemnified party and such indemnified party seeks or intends to seek indemnity from an indemnifying party, the indemnifying party will be entitled to participate in, and, to the extent that it shall elect, jointly with all other indemnifying parties similarly notified, by written notice delivered to the indemnified party promptly after receiving the aforesaid notice from such indemnified party, to assume the defense thereof with counsel reasonably satisfactory to such indemnified party; provided, however, if the defendants in any such action include both the indemnified party and the indemnifying party and the indemnified party shall have reasonably concluded that a conflict may arise between the positions of the indemnifying party and the indemnified party in conducting the defense of any such action or that there may be legal defenses available to it and/or other indemnified parties which are different from or additional to those available to the indemnifying party, the indemnified party or parties shall have the right to select separate counsel to assume such legal defenses and to otherwise participate in the defense of such action on behalf of such indemnified party or parties. Upon receipt of notice from the indemnifying party to such indemnified party of such indemnifying party's election so to assume the defense of such action and approval by the indemnified party of counsel, the indemnifying party will not be liable to such indemnified party under this Section 6 for any legal or other expenses subsequently incurred by such indemnified party in connection with the defense thereof unless (i) the indemnified party shall have employed separate counsel in accordance with the proviso to the preceding sentence (it being understood, however, that the indemnifying party shall not be liable for the fees and expenses of more than one separate counsel (together with local counsel), representing the indemnified parties who are parties to such action), which counsel (together with any local counsel) for the indemnified parties shall be selected by the Agent (in the case of counsel for the indemnified parties referred to in Section 6(a) above) or the indemnified party (in the case of counsel for the indemnified parties referred to in Section 6(b) above), (ii) the indemnifying party shall not have employed counsel satisfactory to the indemnified party to represent the indemnified party within a reasonable time after notice of commencement of the action or (iii) the indemnifying party has authorized in writing the employment of counsel for the indemnified party at the expense of the indemnifying party, in each of which cases the reasonable and documented fees and expenses of counsel shall be at the expense of the indemnifying party and shall be paid as they are incurred.

(d) Settlements. The indemnifying party under this Section 6 shall not be liable for any settlement of any proceeding effected without its written consent, but if settled with such consent or if there be a final judgment for the plaintiff, the indemnifying party agrees to indemnify the indemnified party against any loss, claim, damage, liability or expense by reason of such settlement

or judgment. Notwithstanding the foregoing sentence, if at any time an indemnified party shall have requested an indemnifying party to reimburse the indemnified party for reasonable and documented fees and expenses of counsel as contemplated by Section 6(c) hereof, the indemnifying party agrees that it shall be liable for any settlement of any proceeding effected without its written consent if (i) such settlement is entered into more than thirty (30) calendar days after receipt by such indemnifying party of the aforesaid request; and (ii) such indemnifying party shall not have reimbursed the indemnified party in accordance with such request prior to the date of such settlement. No indemnifying party shall, without the prior written consent of the indemnified party, effect any settlement, compromise or consent to the entry of judgment in any pending or threatened action, suit or proceeding in respect of which any indemnified party is or could have been a party and indemnity was or could have been sought hereunder by such indemnified party, unless such settlement, compromise or consent includes an unconditional release of such indemnified party from all liability on claims that are the subject matter of such action, suit or proceeding.

(e) Contribution. If the indemnification provided for in this Section 6 is for any reason held to be unavailable to or otherwise insufficient to hold harmless an indemnified party in respect of any losses, claims, damages, liabilities or expenses referred to therein, then each indemnifying party shall contribute to the aggregate amount paid or payable by such indemnified party, as incurred, as a result of any losses, claims, damages, liabilities or expenses referred to therein (i) in such proportion as is appropriate to reflect the relative benefits received by the Company, on the one hand, and the Agent, on the other hand, from the offering of the Shares pursuant to this Agreement; or (ii) if the allocation provided by clause (i) above is not permitted by applicable law, in such proportion as is appropriate to reflect not only the relative benefits referred to in clause (i) above but also the relative fault of the Company, on the one hand, and the Agent, on the other hand, in connection with the statements or omissions which resulted in such losses, claims, damages, liabilities or expenses, as well as any other relevant equitable considerations. The relative benefits received by the Company, on the one hand, and the Agent, on the other hand, in connection with the offering of the Shares pursuant to this Agreement shall be deemed to be in the same respective proportions as the total gross proceeds from the offering of the Shares (before deducting expenses) received by the Company bear to the total Selling Commissions received by the Agent. The relative fault of the Company, on the one hand, and the Agent, on the other hand, shall be determined by reference to, among other things, whether any such untrue or alleged untrue statement of a material fact or omission or alleged omission to state a material fact relates to information supplied by the Company, on the one hand, or the Agent, on the other hand, and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission.

The amount paid or payable by a party as a result of the losses, claims, damages, liabilities and expenses referred to above shall be deemed to include, subject to the limitations set forth in Section 6(c), any legal or other reasonable and documented fees or expenses reasonably incurred by such party in connection with investigating or defending any action or claim. The provisions set forth in Section 6(c) with respect to notice of commencement of any action shall apply if a claim for contribution is to be made under this Section 6(e); *provided, however,* that no additional notice shall be required with respect to any action for which notice has been given under Section 6(c) for purposes of indemnification.

The Company and the Agent agree that it would not be just and equitable if contribution pursuant to this Section 6(e) were determined by pro rata allocation or by any other method of allocation which does not take account of the equitable considerations referred to in this Section 6(e).

Notwithstanding the provisions of this Section 6(e), the Agent shall not be required to contribute any amount in excess of the Selling Commissions received by the Agent in connection with the offering contemplated hereby. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. For purposes of this Section 6(e), each officer and employee of the Agent and each person, if any, who controls the Agent within the meaning of the Securities Act or the Exchange Act shall have the same rights to contribution as the Agent, and each director of the Company, each officer of the Company who signed the Registration Statement, and each person, if any, who controls the Company within the meaning of the Securities Act and the Exchange Act shall have the same rights to contribution as the Company.

Section 7. TERMINATION & SURVIVAL

(a) Term. Subject to the provisions of this Section 7, the term of this Agreement shall continue from the date of this Agreement until the end of the Agency Period, unless earlier terminated by the parties to this Agreement pursuant to this Section 7.

(b) Termination; Survival Following Termination.

(i) Either party may terminate this Agreement prior to the end of the Agency Period, by giving written notice as required by this Agreement, upon three (3) Trading Days' notice to the other party; provided that, (A) if the Company terminates this Agreement after the Agent confirms to the Company any sale of Shares, the Company shall remain obligated to comply with Section 3(b)(v) with respect to such Shares and (B) Section 2, Section 6, Section 7 and Section 8 shall survive termination of this Agreement. If termination shall occur prior to the Settlement Date for any sale of Shares, such sale shall nevertheless settle in accordance with the terms of this Agreement.

(ii) In addition to the survival provision of Section 7(b)(i), the respective indemnities, agreements, representations, warranties and other statements of the Company, of its officers and of the Agent set forth in or made pursuant to this Agreement will remain in full force and effect, regardless of any investigation made by or on behalf of the Agent or the Company or any of its or their partners, officers or directors or any controlling person, as the case may be, and, anything herein to the contrary notwithstanding, will survive delivery of and payment for the Shares sold hereunder and any termination of this Agreement.

Section 8. MISCELLANEOUS

(a) Press Releases and Disclosure. The Company may issue a press release describing the material terms of the transactions contemplated hereby as soon as practicable following the date of this Agreement, and may file with the Commission a Current Report on Form 8-K or a Quarterly Report on Form 10-Q, with this Agreement attached as an exhibit thereto, describing the material terms of the transactions contemplated hereby, and the Company shall consult with the Agent prior to making such disclosures, and the parties hereto shall use all commercially reasonable efforts, acting

in good faith, to agree upon a text for such disclosures that is reasonably satisfactory to all parties hereto. No party hereto shall issue thereafter any press release or like public statement (including, without limitation, any disclosure required in reports filed with the Commission pursuant to the Exchange Act) related to this Agreement or any of the transactions contemplated hereby without the prior written approval of the other party hereto, except as may be necessary or appropriate in the reasonable opinion of the party seeking to make disclosure to comply with the requirements of applicable law or stock exchange rules. If any such press release or like public statement is so required, the party making such disclosure shall consult with the other party prior to making such disclosure, and the parties shall use all commercially reasonable efforts, acting in good faith, to agree upon a text for such disclosure that is reasonably satisfactory to all parties hereto.

(b) No Advisory or Fiduciary Relationship. The Company acknowledges and agrees that (i) the transactions contemplated by this Agreement, including the determination of any fees, are arm's-length commercial transactions between the Company and the Agent, (ii) when acting as a principal under this Agreement, the Agent is and has been acting solely as a principal is not the agent or fiduciary of the Company, or its stockholders, creditors, employees or any other party, (iii) the Agent has not assumed nor will assume an advisory or fiduciary responsibility in favor of the Company with respect to the transactions contemplated hereby or the process leading thereto (irrespective of whether the Agent has advised or is currently advising the Company on other matters) and the Agent does not have any obligation to the Company with respect to the transactions contemplated hereby except the obligations expressly set forth in this Agreement, (iv) the Agent and its Affiliates may be engaged in a broad range of transactions that involve interests that differ from those of the Company, and (v) the Agent has not provided any legal, accounting, regulatory or tax advice with respect to the transactions contemplated hereby and the Company has consulted its own legal, accounting, regulatory and tax advisors to the extent it deemed appropriate.

(c) Research Analyst Independence. The Company acknowledges that the Agent's research analysts and research departments are required to and should be independent from their respective investment banking divisions and are subject to certain regulations and internal policies, and as such the Agent's research analysts may hold views and make statements or investment recommendations and/or publish research reports with respect to the Company or the offering contemplated by this Agreement that differ from the views of their respective investment banking divisions. The Company understands that the Agent is a full service securities firm and as such from time to time, subject to applicable securities laws, may effect transactions for its own account or the account of its customers and hold long or short positions in debt or equity securities of the companies that may be the subject of the transactions contemplated by this Agreement.

(d) Notices. All communications hereunder shall be in writing and shall be mailed, hand delivered, sent via electronic mail (if applicable) or telecopied and confirmed to the parties hereto as follows:

If to the Agent:

Jefferies LLC
520 Madison Avenue
New York, NY 10022
Attention: General Counsel

and an additional copy (which shall not constitute notice) to:

Paul Hastings LLP
MetLife Building
200 Park Avenue
New York, New York 10166
Attention: Siavosh Salimi and William A. Magioncalda.

If to the Company:
HOOKIPA Pharma Inc.
350 Fifth Avenue, 72nd Floor, Suite 7240
New York, New York 10118
Attention: Malte Peters, M.D.

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

Cooley LLP
55 Hudson Yards
New York, New York 10001
Attention: Divakar Gupta.

Any party hereto may change the address for receipt of communications by giving written notice to the others in accordance with this Section 8(d).

(e) Successors. This Agreement will inure to the benefit of and be binding upon the parties hereto, and to the benefit of the employees, officers and directors and controlling persons referred to in Section 6, and in each case their respective successors, and no other person will have any right or obligation hereunder. The term "successors" shall not include any purchaser of the Shares as such from the Agent merely by reason of such purchase.

(f) Partial Unenforceability. The invalidity or unenforceability of any Article, Section, paragraph or provision of this Agreement shall not affect the validity or enforceability of any other Article, Section, paragraph or provision hereof. If any Article, Section, paragraph or provision of this Agreement is for any reason determined to be invalid or unenforceable, there shall be deemed to be made such minor changes (and only such minor changes) as are necessary to make it valid and enforceable.

(g) Recognition of U.S. Special Resolutions Regimes. In the event that the Agent is a Covered Entity and becomes subject to a proceeding under a U.S. Special Resolution Regime, the transfer from the Agent of this Agreement, and any interest and obligation in or under this Agreement, will be effective to the same extent as the transfer would be effective under the U.S. Special Resolution Regime if this Agreement, and any such interest and obligation, were governed by the laws of the United States or a state of the United States. In the event that the Agent is a Covered Entity and the Agent or a BHC Act Affiliate of the Agent becomes subject to a proceeding under a U.S. Special Resolution Regime, Default Rights under this Agreement that may be exercised against the Agent are permitted to be exercised to no greater extent than such Default Rights could be exercised under the

U.S. Special Resolution Regime if this Agreement were governed by the laws of the United States or a state of the United States. For purposes of this Agreement, (A) "**BHC Act Affiliate**" has the meaning assigned to the term "affiliate" in, and shall be interpreted in accordance with, 12 U.S.C. § 1841(k); (B) "**Covered Entity**" means any of the following: (i) a "covered entity" as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 252.82(b); (ii) a "covered bank" as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 47.3(b); or (iii) a "covered FSI" as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 382.2(b); (C) "**Default Right**" has the meaning assigned to that term in, and shall be interpreted in accordance with, 12 C.F.R. §§ 252.81, 47.2 or 382.1, as applicable; and (D) "**U.S. Special Resolution Regime**" means each of (i) the Federal Deposit Insurance Act and the regulations promulgated thereunder and (ii) Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act and the regulations promulgated thereunder.

(h) Governing Law Provisions. This Agreement shall be governed by and construed in accordance with the internal laws of the State of New York applicable to agreements made and to be performed in such state. Any legal suit, action or proceeding arising out of or based upon this Agreement or the transactions contemplated hereby ("**Related Proceedings**") may be instituted in the federal courts of the United States of America located in the Borough of Manhattan in the City of New York or the courts of the State of New York in each case located in the Borough of Manhattan in the City of New York (collectively, the "**Specified Courts**"), and each party irrevocably submits to the exclusive jurisdiction (except for proceedings instituted in regard to the enforcement of a judgment of any such court (a "**Related Judgment**"), as to which such jurisdiction is non-exclusive) of such courts in any such suit, action or proceeding. Service of any process, summons, notice or document by mail to such party's address set forth above shall be effective service of process for any suit, action or other proceeding brought in any such court. The parties irrevocably and unconditionally waive any objection to the laying of venue of any suit, action or other proceeding in the Specified Courts and irrevocably and unconditionally waive and agree not to plead or claim in any such court that any such suit, action or other proceeding brought in any such court has been brought in an inconvenient forum.

(i) General Provisions. This Agreement constitutes the entire agreement of the parties to this Agreement and supersedes all prior written or oral and all contemporaneous oral agreements, understandings and negotiations with respect to the subject matter hereof. This Agreement may be executed in two or more counterparts, each one of which shall be an original, with the same effect as if the signatures thereto and hereto were upon the same instrument, and may be delivered by facsimile transmission or by electronic delivery of a portable document format (PDF) file (including any electronic signature complying with the U.S. federal ESIGN Act of 2000, e.g., www.docusign.com or www.echosign.com). This Agreement may not be amended or modified unless in writing by all of the parties hereto, and no condition herein (express or implied) may be waived unless waived in writing by each party whom the condition is meant to benefit. The Article and Section headings herein are for the convenience of the parties only and shall not affect the construction or interpretation of this Agreement.

[Signature Page Immediately Follows]

If the foregoing is in accordance with your understanding of our agreement, kindly sign and return to the Company the enclosed copies hereof, whereupon this instrument, along with all counterparts hereof, shall become a binding agreement in accordance with its terms

Very truly yours,

HOOKIPA PHARMA INC.

By: /s/ Malte Peters
Name: Malte Peters
Title: Chief Executive Officer

By: Terry Coelho
Name: Terry Coelho
Title: Executive Vice President and Chief Financial Officer

The foregoing Agreement is hereby confirmed and accepted by the Agent in New York, New York as of the date first above written.

JEFFERIES LLC

By: /s/ Donald Lynaugh
Name: Donald Lynaugh
Title: Managing Director

EXHIBIT A

ISSUANCE NOTICE

[Date]

Jefferies LLC
520 Madison Avenue
New York, New York 10022

Attn: [_____]

Reference is made to the Open Market Sale Agreement between HOOKIPA Pharma Inc. (the "**Company**") and Jefferies LLC (the "**Agent**") dated as of August 8, 2024. The Company confirms that all conditions to the delivery of this Issuance Notice are satisfied as of the date hereof.

Date of Delivery of Issuance Notice (determined pursuant to Section 3(b)(i)):

_____

Issuance Amount (equal to the total Sales Price for such Shares):

$_____

Number of days in selling period: _____

First date of selling period: _____

Last date of selling period: _____

Settlement Date(s) if other than
standard T+1 settlement: _____

Floor Price Limitation: $ ____ per share

Comments: _____

_____

By: _____
Name:
Title:

Schedule A

Notice Parties

The Company

Malte Peters, M.D.

Terry Coelho

The Agent

Donald Lynaugh

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER PURSUANT TO RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Malte Peters, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of HOOKIPA Pharma 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.

Dated: August 8, 2024

/s/ Malte Peters

Malte Peters
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER PURSUANT TO RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Terry Coelho, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of HOOKIPA Pharma 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.

Dated: August 8, 2024

/s/ Terry Coelho

Terry Coelho
Executive Vice President and Chief Financial Officer
(Principal Financial and Accounting Officer)

Exhibit 32.1

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

In connection with the Quarterly Report of HOOKIPA Pharma Inc. (the "Company") on Form 10-Q for the quarterly period ended June 30, 2024 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned officers hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of their knowledge:

(1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: August 8, 2024

/s/ Malte Peters

Malte Peters
Chief Executive Officer
(Principal Executive Officer)

Dated: August 8, 2024

/s/ Terry Coelho

Terry Coelho
Executive Vice President and Chief Financial Officer
(Principal Financial and Accounting Officer)