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 March 31, 2023

OR

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

For the transition period from __________ to

Commission File Number: 001-37383

Arcadia Biosciences, Inc.
(Exact Name of Registrant as Specified in its Charter)

Delaware	**81-0571538**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
5950 Sherry Lane, Suite 215 Dallas, TX	**75225**
(Address of Principal Executive Offices)	**(Zip Code)**

Registrant's telephone number, including area code: (214) 974-8921

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	RKDA	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 Exchange Act). Yes ☐ No ☒

As of May 8, 2023, the registrant had 950,406 shares of common stock outstanding, $0.001 par value per share.

Arcadia Biosciences, Inc.

FORM 10-Q FOR THE QUARTER ENDED March 31, 2023

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ITEM 1. CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

Arcadia Biosciences, Inc.

Condensed Consolidated Balance Sheets

(Unaudited)

(In thousands, except share data)

	March 31, 2023	December 31, 2022
Assets		
Current assets:		
Cash and cash equivalents	$ 22,998	$ 20,644
Accounts receivable and other receivables, net of allowance for doubtful accounts of $18 and $3 as of March 31, 2023 and December 31, 2022, respectively	923	1,287
Inventories, net — current	2,591	2,571
Assets held for sale	87	87
Prepaid expenses and other current assets	606	809
Total current assets	27,205	25,398
Property and equipment, net	622	704
Right of use asset	1,618	1,848
Inventories, net — noncurrent	760	767
Intangible assets, net	40	40
Other noncurrent assets	165	165
Total assets	$ 30,410	$ 28,922
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable and accrued expenses	$ 2,785	$ 2,881
Amounts due to related parties	15	48
Operating lease liability — current	1,014	1,010
Other current liabilities	283	270
Total current liabilities	4,097	4,209
Operating lease liability — noncurrent	760	1,007
Common stock warrant and option liabilities	6,861	806
Other noncurrent liabilities	2,000	2,000
Total liabilities	13,718	8,022
Commitments and contingencies (Note 13)		
Stockholders' equity:		
Common stock, $0.001 par value—150,000,000 shares authorized as of March 31, 2023 and December 31, 2022; 857,572 and 616,079 shares issued and outstanding as of March 31, 2023 and December 31, 2022, respectively	65	65
Additional paid-in capital	284,003	278,827
Accumulated deficit	(267,243)	(257,859)
Total stockholders' equity	16,825	21,033
Non-controlling interest	(133)	(133)
Total stockholders' equity	16,692	20,900
Total liabilities and stockholders' equity	$ 30,410	$ 28,922

See accompanying notes to the unaudited condensed consolidated financial statements.

Arcadia Biosciences, Inc.

Condensed Consolidated Statements of Operations and Comprehensive Loss

(Unaudited)

(In thousands, except share and per share data)

	Three Months Ended March 31, 2023	Three Months Ended March 31, 2022
Revenues:		
Product	$ 1,509	$ 3,170
Royalty	—	50
Total revenues	1,509	3,220
Operating expenses (income):		
Cost of revenues	825	3,458
Research and development	359	395
Change in fair value of contingent consideration	—	(31)
Gain on sale of property and equipment	(19)	(328)
Selling, general and administrative	4,392	4,349
Total operating expenses	5,557	7,843
Loss from operations	(4,048)	(4,623)
Interest income (expense)	198	(1)
Other income, net	32	14
Valuation loss on March 2023 PIPE	(6,076)	—
Change in fair value of common stock warrant and option liabilities	940	—
Issuance and offering costs allocated to liability classified options	(430)	—
Net loss	(9,384)	(4,610)
Net loss attributable to non-controlling interest	—	(122)
Net loss attributable to common stockholders	$ (9,384)	$ (4,488)
Net loss per share attributable to common stockholders:		
Basic and diluted	$ (10.86)	$ (8.09)
Weighted-average number of shares used in per share calculations:		
Basic and diluted	864,391	554,675

See accompanying notes to the unaudited condensed consolidated financial statements.

Arcadia Biosciences, Inc.

Condensed Consolidated Statements of Stockholders' Equity

(Unaudited)

(In thousands, except share data)

	Common Stock		Additional Paid-In	Accumulated	Non-Controlling	Total Stockholders'
	Shares	Amount	Capital	Deficit	Interest	Equity
Balance at December 31, 2022	616,079	$ 65	$ 278,827	$ (257,859)	$ (133)	$ 20,900
Issuance of shares related to March 2023 PIPE	165,500	—	4,740	—	—	4,740
Modification of warrants related to March 2023 PIPE	—	—	219	—	—	219
Issuance of shares related to August 2022 pre-funded warrants exercise	56,813	—	—	—	—	—
Issuance of shares related to employee stock purchase plan	88	—	5	—	—	5
Issuance of shares related to reverse stock split	19,092	—	—	—	—	—
Stock-based compensation	—	—	212	—	—	212
Net loss	—	—	—	(9,384)	—	(9,384)
Balance at March 31, 2023	857,572	$ 65	$ 284,003	$ (267,243)	$ (133)	$ 16,692

	Common Stock		Additional Paid-In	Accumulated	Non-Controlling	Total Stockholders'
	Shares	Amount	Capital	Deficit	Interest	Equity
Balance at December 31, 2021	554,609	$ 63	$ 257,515	$ (226,485)	$ 103	$ 31,196
Reclassification upon adoption of ASU 2020-06	—	—	19,390	(15,998)	—	3,392
Issuance of shares related to employee stock purchase plan	118	—	4	—	—	4
Stock-based compensation	—	—	260	—	—	260
Net loss	—	—	—	(4,488)	(122)	(4,610)
Balance at March 31, 2022	554,727	$ 63	$ 277,169	$ (246,971)	$ (19)	$ 30,242

See accompanying notes to the unaudited condensed consolidated financial statements.

Arcadia Biosciences, Inc.

Condensed Consolidated Statements of Cash Flows

(Unaudited)

(In thousands)

	Three Months Ended March 31, 2023	Three Months Ended March 31, 2022
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net loss	$ (9,384)	$ (4,610)
Adjustments to reconcile net loss to cash used in operating activities:		
Change in fair value of common stock warrant and option liabilities	(940)	—
Change in fair value of contingent consideration	—	(31)
Issuance and offering costs allocated to liability classified options	430	—
Valuation loss on March 2023 PIPE	6,076	—
Depreciation	71	149
Amortization of intangible assets	—	13
Lease amortization	180	166
Gain on disposal of property and equipment	(19)	(328)
Stock-based compensation	212	260
Write-down of inventories	23	368
Changes in operating assets and liabilities:		
Accounts receivable and other receivables	80	(1,398)
Inventories	(37)	669
Prepaid expenses and other current assets	203	208
Other noncurrent assets	—	22
Accounts payable and accrued expenses	(149)	(198)
Amounts due to related parties	(33)	5
Other current liabilities	12	—
Operating lease liabilities	(191)	(180)
Net cash used in operating activities	(3,466)	(4,885)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Proceeds from sale of property and equipment	30	787
Proceeds from sale of Verdeca — earn-out received	285	—
Purchases of property and equipment	—	(40)
Net cash provided by investing activities	315	747
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from issuance of common stock, pre-funded warrants and preferred investment options from March 2023 PIPE	5,997	—
Payments of offering costs relating to March 2023 PIPE	(497)	—
Proceeds from ESPP purchases	5	4
Net cash provided by financing activities	5,505	4
Net (decrease) increase in cash and cash equivalents	2,354	(4,134)
Cash and cash equivalents — beginning of period	20,644	28,685
Cash and cash equivalents — end of period	$ 22,998	$ 24,551
SUPPLEMENTAL DISCLOSURES OF CASH FLOW INFORMATION:		
Cash paid for interest	$ —	$ 1
NONCASH INVESTING AND FINANCING ACTIVITIES:		
Common stock warrant liabilities reclassifed to equity upon adoption of ASU 2020-06	$ —	$ 3,392
Accrued legal and accounting fees included in offering costs related to March 2023 PIPE	$ 51	$ —
Common stock options issued to placement agent and included in offering costs related to March 2023 PIPE	$ 212	$ —
Warrant and option modifications included in Valuation loss on March 2023 PIPE	$ 404	$ —
Proceeds from sale of Verdeca in accounts receivable and other receivables	$ 285	$ —

See accompanying notes to the unaudited condensed consolidated financial statements.

1. Description of Business and Basis of Presentation

Organization

Arcadia Biosciences, Inc. (the "Company," "Arcadia" or "management"), was incorporated in Arizona in 2002 and maintains its headquarters in Dallas, Texas, with additional office space in Davis, California, and additional facilities in American Falls, Idaho. The Company was reincorporated in Delaware in March 2015.

The Company is a producer and marketer of innovative, plant-based food and beverage products. Its history as a leader in science-based approaches to developing high-value crop improvements, as well as nutritionally enhanced food ingredients, has laid the foundation for its path forward. The Company used advanced breeding techniques to develop these proprietary innovations which are now being commercialized through the sales of seed and grain, as well as food ingredients and products. The acquisition of the assets of Live Zola, LLC (“Zola”) added coconut water to the Company's portfolio of products.

In May 2021, the Company’s wholly owned subsidiary Arcadia Wellness, LLC (“Arcadia Wellness” or “AW”) acquired the businesses of Eko, Lief, and Zola. The acquisition included consumer CBD brands like Soul Spring™, a CBD-infused botanical therapy brand in the natural category, Saavy Naturals™, a line of natural body care products and ProVault™, a CBD-infused sports performance formula made with natural ingredients, providing effective support and recovery for athletes. Also included in the purchase is Zola, a coconut water sourced exclusively with sustainably grown coconuts from Thailand. In July 2022, the Company licensed Saavy Naturals™ to Radiance Beauty and Wellness, Inc. ("Radiance Beauty").

In August 2019, the Company entered into a joint venture agreement with Legacy Ventures Hawaii, LLC (“Legacy,” see Note 6) to grow, extract, and sell hemp products. The partnership Archipelago Ventures Hawaii, LLC (“Archipelago”), combines the Company’s extensive genetic expertise and resources with Legacy’s experience in hemp extraction and sales. In October 2021, Arcadia and Legacy mutually agreed to wind down the cultivation activities of Archipelago, due to regulatory challenges and a saturated hemp market.

In February 2012, the Company formed Verdeca, which was equally owned with Bioceres. Verdeca was formed to develop and deregulate soybean varieties using both partners’ agricultural technologies. In November 2020, Arcadia sold its membership interest in Verdeca to Bioceres in a transaction in which Arcadia received cash, shares of Bioceres stock and a royalty stream of up to $10.0 million on sales of Haab 4 soybeans (“HB4”) soybean. An additional $2.0 million in cash is to be paid upon achievement by Verdeca of reaching commercial plantings of at least 200,000 hectares of HB4 or China approving the HB4 soybean trait for “food and feed”. During 2022, Bioceres received China's approval of the HB4 soybean trait and as a result, Arcadia recorded license revenue of $862,000 and a gain on sale of Verdeca of $1.1 million on the condensed consolidated statements of operations and comprehensive loss. As of March 31, 2023, the Company received payment of $1.5 million with the remaining $0.5 million in accounts receivable and other receivables, which the Company anticipates to receive over the next three months pursuant to the agreement.

Reverse Stock Split

In February 2023, the Company’s board of directors approved a reverse split of 40:1 on the Company’s issued and outstanding common stock. On February 15, 2023, the Company’s stockholders approved the certificate of amendment, which the Company filed on February 27, 2023 with the Secretary of State of Delaware to effect the reverse split on March 1, 2023. As a result of the reverse stock split, additional shares of common stock of 19,092 were issued in lieu of fractional shares. All issued and outstanding common stock, options to purchase common stock and per share amounts contained in the condensed consolidated financial statements have been retroactively adjusted to reflect the reverse stock split for all periods presented.

Basis of Presentation and Principles of Consolidation

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States (“GAAP”) for interim financial statements and are in the form prescribed by the Securities and Exchange Commission (the “SEC”) in instructions to Form 10-Q and Rule 10-01 of Regulation S-X. In the opinion of management, the accompanying condensed consolidated financial statements reflect all adjustments, consisting of normal recurring adjustments, considered necessary for a fair statement of the Company’s financial position, results of operations and cash flows for the periods indicated. All material intercompany accounts and transactions have been eliminated in consolidation. The accompanying unaudited condensed consolidated financial statements include the accounts of the Company, Arcadia Wellness, and Archipelago.

The Company uses a qualitative approach in assessing the consolidation requirement for variable interest entities ("VIEs"). This approach focuses on determining whether the Company has the power to direct the activities of the VIE that most significantly affect the VIE’s economic performance and whether the Company has the obligation to absorb losses, or the right to receive benefits, that could potentially be significant to the VIE.

For all periods presented, the Company has determined that it is the primary beneficiary of Archipelago, a joint venture, as it has a controlling interest in Archipelago. Accordingly, the Company consolidates Archipelago in the condensed consolidated financial statements after eliminating intercompany transactions. For consolidated joint ventures, the non-controlling partner's share of the assets, liabilities and operations of the joint venture is included in non-controlling interests as equity of the Company. The non-controlling partner's interest is generally computed as the joint venture partner's ownership percentage of Archipelago. Net loss attributable to non-controlling interest of $122,000 is recorded as an adjustment to net loss to arrive at net loss attributable to common stockholders for the three months ended March 31, 2022. There was minimal activity during the three months ended March 31, 2023. The non-controlling partner's equity interests are presented as non-controlling interests on the condensed consolidated balance sheets.

The information included in these condensed consolidated financial statements and notes thereto should be read in conjunction with Management's Discussion and Analysis of Financial Condition and Results of Operations included herein and Management's Discussion and Analysis of Financial Condition and Results of Operations and the condensed consolidated financial statements and notes thereto for the fiscal year ended December 31, 2022 included in the Company's Annual Report on Form 10-K, filed with the SEC on March 30, 2023.

Liquidity, Capital Resources, and Going Concern

The accompanying condensed consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities during the normal course of business. Since inception, the Company has financed its operations primarily through equity and debt financings. As of March 31, 2023, the Company had an accumulated deficit of $267.2 million, and cash and cash equivalents of $23.0 million. For the three months ended March 31, 2023, the Company had a net loss of $9.4 million and net cash used in operations of $3.5 million. For the twelve months ended December 31, 2022, the Company had net losses of $15.6 million and net cash used in operations of $14.0 million.

With cash and cash equivalents of $23.0 million as of March 31, 2023, the Company believes that its existing cash and cash equivalents will not be sufficient to meet its anticipated cash requirements for at least the next 12-18 months from the issuance date of these financial statements, and thus raises substantial doubt about the Company's ability to continue as a going concern. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

The Company may seek to raise additional funds through debt or equity financings. The Company may also consider entering into additional partner arrangements. The sale of additional equity would result in dilution to the Company's stockholders. The incurrence of debt would result in debt service obligations, and the instruments governing such debt could provide for additional operating and financing covenants that would restrict operations. If the Company requires additional funds and is unable to secure adequate additional funding at terms agreeable to the Company, the Company may be forced to reduce spending, extend payment terms with suppliers, liquidate assets, or suspend or curtail planned product launches. Any of these actions could materially harm the business, results of operations and financial condition.

2. Recent Accounting Pronouncements

In June 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-13, *Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*. Additionally, the FASB issued ASU No. 2019-04, *Codification Improvements to Topic 326* in April 2019 and ASU 2019-05, *Financial Instruments — Credit Losses (Topic 326) — Targeted Transition Relief* in May 2019. The amendments affect loans, debt securities, trade receivables, net investments in leases, off-balance-sheet credit exposures, reinsurance receivables, and any other financial assets not excluded from the scope that have the contractual right to receive cash. In November 2019, the FASB issued ASU No. 2019-10, which defers the effective date of ASU No. 2016-13 for smaller reporting companies to fiscal years beginning after December 15, 2022, including interim periods within those fiscal years. The Company adopted ASU No. 2016-13 on January 1, 2023 with an immaterial impact on the Company's disclosures.

3. Inventory

Inventory costs are tracked on a lot-identified basis and are included as cost of revenues when sold. Inventories are stated at the lower of cost or net realizable value. The Company makes adjustments to inventory when conditions indicate that the net realizable value may be less than cost due to physical deterioration, obsolescence, changes in price levels, or other factors. Additional adjustments to inventory are made for excess and slow-moving inventory on hand that is not expected to be sold within a reasonable timeframe to reduce the carrying amount to its estimated net realizable value. The write-downs to inventory are included in cost of revenues and are based upon estimates about future demand from the Company's customers and distributors and market conditions. The Company recorded a write-down of $23,000 related to packaging materials during the three months ended March 31, 2023. The Company recorded write-downs of wheat and body care inventories of $368,000 during the three months ended March 31, 2022. If there are significant changes in demand and market conditions, substantial future write-downs of inventory may be required, which would materially increase the Company's expenses in the period the write down is taken and materially affect the Company's operating results.

Inventories, net consist of the following (in thousands):

	March 31, 2023	December 31, 2022
Raw materials	$ 582	$ 610
Goods in process	114	—
Finished goods	2,655	2,728
Inventories	$ 3,351	$ 3,338

4. Property and Equipment, Net

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

	March 31, 2023	December 31, 2022
Laboratory equipment	$ 630	$ 679
Software and computer equipment	407	407
Machinery and equipment	450	450
Furniture and fixtures	83	83
Vehicles	306	306
Leasehold improvements	1,590	1,590
Property and equipment, gross	3,466	3,515
Less: accumulated depreciation and amortization	(2,844)	(2,811)
Property and equipment, net	$ 622	$ 704

Depreciation expense was $71,000 and $149,000 for the three months ended March 31, 2023 and 2022, respectively.

As of March 31, 2023 and December 31, 2022, there was $10,000 of construction in progress included in property and equipment that had not been placed into service and was not subject to depreciation.

Property and equipment are considered assets held for sale when management approves and commits to a plan to dispose of a property or group of properties. The property and equipment held for sale prior to the sale date is separately presented, within current assets, on the condensed consolidated balance sheet as assets held for sale.

During the three months ended March 31, 2023 and 2022, management sold property and equipment and realized a gain on sale of $19,000 and $328,000, respectively, recorded on the condensed consolidated statements of operations and comprehensive loss, with proceeds of $30,000 and $787,000, respectively. The property and equipment sold during the three months ended March 31, 2022 was related to Archipelago and was sold through a local auction.

Property and equipment related to Archipelago, in the amount of $87,000, have been classified as assets held for sale, and are recorded at fair value as of March 31, 2023 and December 31, 2022. The fair value has been estimated using publicly available prices for some of the assets, and business partners' estimates for assets with prices not readily available, due to the relatively small size of the industry in which they can be used.

5. Investments and Fair Value Instruments

Investments

The investments are carried at fair value, based on quoted market prices or other readily available market information. Unrealized and realized gains and losses are recognized as other income in the condensed consolidated statements of operations and comprehensive loss.

The following tables summarize the amortized cost and fair value of the investment securities portfolio at March 31, 2023 and December 31, 2022.

(Dollars in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value
March 31, 2023				
Cash equivalents:				
Money market funds	$ 20,501	$ —	$ —	$ 20,501
Total Assets at Fair Value	$ 20,501	$ —	$ —	$ 20,501

(Dollars in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value
December 31, 2022				
Cash equivalents:				
Money market funds	$ 18,620	$ —	$ —	$ 18,620
Total Assets at Fair Value	$ 18,620	$ —	$ —	$ 18,620

The Company did not have any investment categories that were in a continuous unrealized loss position for more than twelve months as of March 31, 2023.

Fair Value Measurement

The fair value of the investment securities at March 31, 2023 were as follows:

	Fair Value Measurements at March 31, 2023			
(Dollars in thousands)	Level 1	Level 2	Level 3	Total
Assets at Fair Value				
Cash equivalents:				
Money market funds	$ 20,501	$ —	$ —	$ 20,501
Total Assets at Fair Value	$ 20,501	$ —	$ —	$ 20,501

The fair value of the investment securities at December 31, 2022 were as follows:

	Fair Value Measurements at December 31, 2022			
(Dollars in thousands)	Level 1	Level 2	Level 3	Total
Assets at Fair Value				
Cash equivalents:				
Money market funds	$ 18,620	$ —	$ —	$ 18,620
Total Assets at Fair Value	$ 18,620	$ —	$ —	$ 18,620

The Company uses the market approach technique to value its financial instruments and there were no changes in valuation techniques during 2023 or 2022. The Company's financial instruments consist primarily of cash and cash equivalents, accounts receivable and other receivables, accounts payable and accrued liabilities. For accounts receivable and other receivables, accounts payable and accrued liabilities, the carrying amounts of these financial instruments as of March 31, 2023 and December 31, 2022 were considered representative of their fair values due to their short term to maturity or repayment. Cash equivalents are carried at cost, which approximates their fair value.

The Company's Level 3 liabilities consist of a contingent liability resulting from the Anawah, Inc. ("Anawah") acquisition as described in Note 13, as well as preferred investment options related to the March 2023 Private Placement and August 2022 Registered Direct offerings described in Note 9.

The contingent liability related to the Anawah acquisition was measured and recorded on a recurring basis as of March 31, 2023 and December 31, 2022, using unobservable inputs, namely the Company's ability and intent to pursue certain specific products developed using technology acquired in the purchase. A significant deviation in the Company's ability and/or intent to pursue the technology acquired in the purchase could result in a significantly lower (higher) fair value measurement.

The preferred investment option liabilities were measured and recorded on a recurring basis using the Black-Scholes Model with the following assumptions as of March 31, 2023 and December 31, 2022:

	March 2023 Options - Series A & March 2023 Placement Agent Options		March 2023 Options - Series B		August 2022 Options & August 2022 Placement Agent Options	
	March 31, 2023	December 31, 2022	March 31, 2023	December 31, 2022	March 31, 2023	December 31, 2022
Remaining term (in years)	4.92	—	1.42	—	4.42	4.67
Expected volatility	106.7 %	—	106.8 %	—	108.8 %	106.2 %
Risk-free interest rate	3.6 %	—	4.4 %	—	3.7 %	4.0 %
Expected dividend yield	0 %	—	0 %	—	0 %	0 %

The significant input used in the fair value measurement of the Company's Level 3 options liabilities is volatility. A significant increase (decrease) in volatility could result in a significantly higher (lower) fair value measurement.

The following table sets forth the establishment of the Company's Level 3 liabilities, as well as a summary of the changes in the fair value and other adjustments (in thousands):

(Dollars in thousands)	March 2023 Options - Series A	March 2023 Options - Series B	March 2023 Placement Agent Options	August 2022 Options	August 2022 Placement Agent Options	Contingent Liabilities	Total
Balance as of December 31, 2022	$ —	$ —	$ —	$ 767	$ 39	$ 2,000	$ 2,806
Initial recognition	4,324	2,274	212	—	—	—	6,810
Change in fair value and other adjustments	(530)	(69)	(29)	(111)	(16)	—	(755)
Balance as of March 31, 2023	$ 3,794	$ 2,205	$ 183	$ 656	$ 23	$ 2,000	$ 8,861

Assets classified as held for sale are recorded at fair value as of March 31, 2023. The Company has classified the fair value measurements as a Level 3 measurement in the fair value hierarchy as the fair value has been estimated using publicly available prices for some of the assets, and business partners' estimates for assets with prices not readily available, due to the relatively small size of the industry in which they can be used.

6. Consolidated Joint Venture

In 2019, the Company and Legacy Ventures Hawaii, LLC, a Nevada limited liability company ("Legacy"), formed Archipelago Ventures Hawaii, LLC, a Delaware limited liability company and entered into a Limited Liability Company Operating Agreement (the "Operating Agreement"). The Company and Legacy formed Archipelago to develop, extract and commercialize hemp-derived products from industrial hemp grown in Hawaii.

Pursuant to the Operating Agreement, a joint operating committee consisting of two individuals appointed by the Company and two individuals appointed by Legacy will manage Archipelago. As of March 31, 2023, the Company and Legacy hold 50.75% and 49.25% interests in Archipelago, respectively, and have made capital contributions to Archipelago of $3.1 million and $3.0 million, respectively, as determined by the joint operating committee. The Operating Agreement includes indemnification rights, non-competition obligations, and certain rights and obligations in connection with the transfer of membership interests, including rights of first refusal.

The Company consolidates Archipelago in the condensed consolidated financial statements after eliminating intercompany transactions. Net loss attributable to non-controlling interest of $122,000 is recorded as an adjustment to net loss to arrive at net loss attributable to common stockholders for the three months ended March 31, 2022. There was minimal activity during the three months ended March 31, 2023. Legacy's equity interests are presented as non-controlling interests on the condensed consolidated balance sheets. Refer to Note 1 for basis of presentation.

In October 2021, Arcadia and Legacy mutually agreed to wind down the cultivation activities of Archipelago, due to regulatory challenges and a saturated hemp market.

7. Collaborative Arrangements

In August 2017, the Company entered into a collaborative arrangement for the research, development and commercialization of an improved wheat quality trait in North America. This collaborative arrangement is a contractual agreement with Corteva AgriScience ("Corteva") and involves a joint operating activity where both Arcadia and Corteva are active participants in the activities of the collaboration. Arcadia and Corteva participate in the research and development, and Arcadia has the primary responsibility for the intellectual property strategy while Corteva will generally lead the marketing and commercialization efforts. Both parties are exposed to significant risks and rewards of the collaboration and the agreement includes both cost sharing and profit sharing. The activities are performed with no guarantee of either technological or commercial success.

The Company accounts for research and development ("R&D") costs in accordance ASC 730, *Research and Development*, which states R&D costs must be charged to expense as incurred. Accordingly, internal R&D costs are expensed as incurred. Third-party R&D costs are expensed when the contracted work has been performed or as milestone results are achieved.

8. Leases

Operating Leases

As of March 31, 2023, the Company leases office space in Dallas, TX and Davis, CA as well as additional buildings, land and equipment. Leases with an initial term of 12 months or less are not recorded on the balance sheet; the Company recognizes lease expense for these short-term leases on a straight-line basis. The Company subleases a portion of the Davis office lease to third parties. In 2022, the Company terminated its lease for office space in Chesterfield, MO effective September 30, 2022. The original lease term was scheduled to expire in May 2024. As a result, the Company paid $47,000 in early termination fees. In addition, the Company subleased the facility in Chatsworth, CA to Radiance Beauty as part of the licensing agreement beginning November 1, 2022 for the remainder of the lease term. During 2022, the Company entered into an agreement to lease office space in Dallas, TX. The lease commenced in July 2022.

Some leases (the Dallas and Davis offices, a warehouse, and a copy machine) include one or more options to renew, with renewal terms that can extend the lease term from one to six years. The exercise of lease renewal options is at the Company's sole discretion.

The Company's lease agreements do not contain any material variable lease payments, material residual value guarantees or material restrictive covenants. Leases consisted of the following (in thousands):

Leases	Classification	March 31, 2023	December 31, 2022
Assets			
Operating lease assets	Right of use asset	$ 1,618	$ 1,848
Total leased assets		$ 1,618	$ 1,848
Liabilities			
Current - Operating	Operating lease liability- current	$ 1,014	$ 1,010
Noncurrent - Operating	Operating lease liability- noncurrent	760	1,007
Total leased liabilities		$ 1,774	$ 2,017

Lease Cost	Classification	Three Months Ended March 31, 2023	Three Months Ended March 31, 2022
Operating lease cost	SG&A and R&D Expenses	$ 191	$ 276
Short term lease cost	SG&A Expenses	3	3
Sublease income (1)	SG&A and R&D Expenses	(108)	(87)
Net lease cost		$ 86	$ 192

(1) Sublease income is recorded as a reduction to lease expense.

Lease Term and Discount Rate	March 31, 2023	December 31, 2022
Weighted-average remaining lease term (years)	2.2	2.4
Weighted-average discount rate	6.4%	6.0%

9. Equity Financing

March 2023 Private Placement

In March 2023, the Company issued in a private placement offering (the “March 2023 Private Placement”) pursuant to a securities purchase agreement (“March 2023 Purchase Agreement”) (i) 165,500 shares of its common stock, (ii) pre-funded common stock purchase warrants (the “March 2023 Pre-Funded Warrants”) to purchase up to 500,834 shares of common stock, at an exercise price of $0.0001 per share, (iii) Series A preferred investment options (the “March 2023 Options - Series A") to purchase up to a total of 666,334 shares of common stock, at an exercise price of $9.00 per share, and (iv) Series B preferred investment options (the “March 2023 Options - Series B”, and together with the March 2023 Options - Series A, the "March 2023 Options") to purchase up to a total of 666,334 shares of common stock, at an exercise price of $9.00 per share, and raised total gross proceeds of $6.0 million. The March 2023 Private Placement closed on March 6, 2023. The March 2023 Pre-Funded Warrants became exercisable upon issuance and are exercisable until exercised in full. The March 2023 Options - Series A are exercisable at any time at the option of the holder and expire 5 years from the date of issuance. The March 2023 Options - Series B are exercisable at any time at the option of the holder and expire 1.5 years from the date of issuance.

In connection with the March 2023 Private Placement, the Company entered into preferred investment option amendment agreements (the “Option Amendment Agreements”) with certain investors. Under the Option Amendment Agreements, the Company agreed to amend certain existing warrants and preferred investment options to purchase up to a total of 178,132 shares of common stock that were previously issued to the investors in September 2019, May 2020, July 2020, December 2020, January 2021 and August 2022, with exercise prices of $300.80, $191.00, $154.00, $120.00, $125.20 and $37.35 per share, respectively (the “Existing Warrants”). Under the Option Amendment Agreements, the Company agreed to lower the exercise price of the Existing Warrants to $9.00 per share. In addition, the Company granted to a placement agent preferred investment options to purchase a total of 33,317 shares of Common Stock (the “March 2023 Placement Agent Options”) that have an exercise price per share equal to $11.25 and a term of 5 years from the date of issuance. The re-pricing of the Existing Warrants resulted in an increase in fair value of $404,000, of which $185,000 of the increase in fair value was related to the August 2022 liability classified options. The increase in fair value related to the re-pricing of Existing Warrants was recognized in Valuation Loss on March 2023 PIPE on the condensed consolidated statements of operations and comprehensive loss.

The March 2023 Options and March 2023 Placement Agent Options are classified as liabilities within Level 3 due to certain early settlement provisions that preclude them from equity classification. The Company utilized the Black-Scholes Model on March 6, 2023 with the following assumptions for the Series A Investment Options: volatility of 128.55%, stock price of $7.61 and risk-free rate of 4.27%. The following assumptions were utilized for the Series B Investment Options: volatility of 103.33%, stock price of $7.61 and risk-free rate of 4.97%. The estimated fair value of the liability classified March 2023 Options issued was $6.6 million.

The estimated fair value of the common stock issued and March 2023 Pre-Funded Warrants was $5.1 million. The total estimated fair value of the common stock issued, March 2023 Pre-Funded Warrants and March 2023 Options as of March 6, 2023 exceeded the gross proceeds of the March 2023 Private Placement by $5.7 million and this amount was recognized in Valuation Loss on March 2023 PIPE on the condensed consolidated statements of operations and comprehensive loss.

The March 2023 Placement Agent Options were issued for services performed by the placement agent as part of the March 2023 Private Placement and were treated as offering costs. The value of the March 2023 Placement Agent Options was determined to be $212,000, calculated using the Black-Scholes Model. The Company incurred additional offering costs totaling $548,000 that consist of direct incremental legal, advisory, accounting and filing fees relating to the March 2023 Private Placement. A total of $430,000 was allocated to the common stock option liabilities and expensed while the remaining $330,000 was allocated to the common stock and March 2023 Pre-Funded Warrants and offset to additional paid in capital.

August 2022 Registered Direct Offering

On May 11, 2018, the Company filed a shelf Registration Statement on Form S-3 with the SEC which was declared effective on June 8, 2018 (“2018 Shelf Registration Statement”). On April 21, 2022, the Company filed a shelf Registration Statement on Form S-3 with the SEC which was declared effective on May 12, 2022 (“2022 Shelf Registration Statement”). Each of the 2018 Shelf Registration Statement and the 2022 Shelf Registration Statement allows the Company to sell any combination of common stock, preferred stock, warrants and units consisting of such securities in one or more offerings from time to time having aggregate offering prices of up to $50.0 million. The Company ceased being able to use the 2018 Shelf Registration Statement after June 8, 2021, the three-year anniversary of its effective date. The 2022 Shelf Registration Statement may no longer be used after May 12, 2025, the three-year anniversary of its effective date.

In August 2022, the Company entered into a securities purchase agreement (the “August 2022 Purchase Agreement”) pursuant to which it sold (i) 61,250 registered shares of its common stock, pursuant to the 2022 Shelf Registration Statement, (ii) pre-funded common stock purchase warrants (the “August 2022 Pre-Funded Warrants”) to purchase up to 56,813 shares of common stock, at an exercise price of $0.004 per share, which the August 2022 Pre-Funded Warrants were registered under the 2022 Shelf Registration Statement, and (iii) unregistered preferred investment options (the "August 2022 Options") to purchase up to 118,063 shares of common stock, at an exercise price of $37.35 per share, for total gross proceeds of $5.0 million (the “August 2022 Registered Direct Offering”). The August 2022 Registered Direct Offering closed on August 16, 2022. The August 2022 Pre-Funded Warrants became exercisable upon issuance and were fully exercised during the three months ended March 31, 2023. The August 2022 Options became exercisable upon issuance and expire 5 years after the date of issuance. In connection with the August 2022 Registered Direct

Offering, the Company granted to a placement agent preferred investment options ("August 2022 Placement Agent Options") to purchase a total of 5,904 shares of common stock that have an exercise price per share equal to $52.80 and a term of five years.

The August 2022 Options and August 2022 Placement Agent Options are classified as liabilities within Level 3 due to certain early settlement provisions that preclude them from equity classification. The Company utilized the Black-Scholes Model on August 16, 2022 with the following assumptions: volatility of 128.46%, stock price of $37.60, risk-free rate of 2.97% and a term of 5 years. The estimated fair value of the common stock option liabilities was subsequently remeasured at March 31, 2023 with the changes recorded on the Company's condensed consolidated statements of operations and comprehensive loss.

The August 2022 Placement Agent Options were issued for services performed by the placement agent as part of the August 2022 Registered Direct Offering and were treated as offering costs. The value of the August 2022 Placement Agent Options was determined to be $191,000, calculated using the Black-Scholes Model. The Company incurred additional offering costs totaling $488,000 that consist of direct incremental legal, advisory, accounting and filing fees relating to the August 2022 Registered Direct Offering. The offering costs, inclusive of the August 2022 Placement Agent Options, totaled $679,000 and were allocated to the common stock option liabilities, the common stock and August 2022 Pre-Funded Warrants using their relative fair values. A total of $314,000 was allocated to the common stock option liabilities and expensed while the remaining $365,000 was allocated to the common stock and August 2022 Pre-Funded Warrants and offset to additional paid in capital.

10. Warrants and Options

Equity Classified Common Stock Warrants

The Company issued the following warrants to purchase shares of its common stock, which are outstanding as of March 31, 2023 and December 31, 2022, respectively. These warrants are exercisable any time at the option of the holder until their expiration date.

	Issuance Date	Term	Exercise Price Per Share	Exercised during the Year Ended December 31, 2022	Outstanding at December 31, 2022	Exercised during the Three Months Ended March 31, 2023	Outstanding at March 31, 2023
March 2023 Pre-Funded Warrants	March 2023	perpetual	$ —	—	—	—	500,834
December 2022 Service and Performance Warrants (1)	December 2022	5 years	$ 11.20	—	1,000	—	1,000
October 2022 Service and Performance Warrants (1)	October 2022	5 years	$ 16.00	—	1,000	—	1,000
August 2022 Pre-Funded Warrants	August 2022	perpetual	$ —	—	56,813	(56,813)	—
January 2021 Placement Agent Warrants	January 2021	5.5 years	$ 159.60	—	9,846	—	9,846
January 2021 Service and Performance Warrants (1)(3)	January 2021	2 years	$ 123.20	—	188	—	—
December 2020 Warrants (4)	December 2020	5.5 years	$ 9.00	—	16,367	—	16,367
December 2020 Warrants	December 2020	5.5 years	$ 120.00	—	49,100	—	49,100
December 2020 Placement Agent Warrants	December 2020	5 years	$ 152.80	—	3,274	—	3,274
July 2020 Warrants (4)	July 2020	5.5 years	$ 9.00	—	16,036	—	16,036
July 2020 Placement Agent Warrants	July 2020	5.5 years	$ 198.80	—	802	—	802
May 2020 Warrants (4)	May 2020	5 years	$ 9.00	—	9,946	—	9,946
May 2020 Warrants	May 2020	5 years	$ 191.20	—	24,863	—	24,863
May 2020 Placement Agent Warrants	May 2020	5 years	$ 245.20	—	1,741	—	1,741
March 2020 Service and Performance Warrants (1)(3)	March 2020	3 years	$ 100.00	—	459	—	—
September 2019 Placement Agent Warrants	September 2019	5 years	$ 379.20	—	1,649	—	1,649
June 2019 Placement Agent Warrants	June 2019	5 years	$ 251.60	—	1,862	—	1,862
April 2019 Service and Performance Warrants (1)	April 2019	5 years	$ 247.20	—	3,629	—	3,629
June 2018 Placement Agent Warrants	June 2018	5 years	$ 502.80	—	1,741	—	1,741
March 2018 Placement Agent Warrants (3)	March 2018	5 years	$ 1,662.40	—	376	—	—
January 2021 Warrants (2)(4)	January 2021	5.5 years	$ 9.00	—	7,831	—	7,831
January 2021 Warrants (2)	January 2021	5.5 years	$ 125.20	—	90,629	—	90,629
September 2019 Warrants (2)(4)	September 2019	5.5 years	$ 9.00	—	9,892	—	9,892
September 2019 Warrants (2)	September 2019	5.5 years	$ 300.80	—	6,594	—	6,594
June 2019 Warrants (2)	June 2019	5.5 years	$ 200.00	—	10,896	—	10,896
March 2018 Warrants (2)(3)	March 2018	5 years	$ 429.20	—	16,036	—	—
Total				—	342,570	(56,813)	769,532

[1] The Company issued service and performance warrants ("Service and Performance Warrants") in connection with professional services agreements with non-affiliated third party entities.

(2) Certain warrants contain a contingent cash payment feature and therefore were accounted for as a liability at the date of issuance and were adjusted to fair value at each balance sheet date. Upon adoption of ASU No. 2020-06 on January 1, 2022, all of the common stock warrant liabilities have been reclassified to equity classified common stock warrants, due to the elimination of the contingent cash payments as criteria for liability classification.

(3) These warrants expired in the first quarter of 2023.

(4) These warrants were repriced as part of the March 2023 Private Placement offering.

Liability Classified Preferred Investment Options

The preferred investment options issued in connection with the March 2023 Private Placement and August 2022 Registered Direct offerings contain certain early settlement provisions that preclude them from equity classification and therefore were accounted for as liabilities at the date of issuance and are adjusted to fair value at each balance sheet date. The change in fair value of the options liabilities is recorded as change in fair value of common stock warrant and option liabilities in the consolidated statements of operations and comprehensive loss. The key terms and activity of the liability classified preferred investment options are summarized as follows:

	Issuance Date	Term	Exercise Price Per Share	Exercised during the Year Ended December 31, 2022	Outstanding at December 31, 2022	Exercised during the Three Months Ended March 31, 2023	Outstanding at March 31, 2023
March 2023 Options - Series A	March 2023	5 years	$ 9.00	—	—	—	666,334
March 2023 Options - Series B	March 2023	1.5 years	$ 9.00	—	—	—	666,334
March 2023 Placement Agent Options	March 2023	5 years	$ 11.25	—	—	—	33,317
August 2022 Options (1)	August 2022	5 years	$ 9.00	—	118,063	—	118,063
August 2022 Placement Agent Options	August 2022	5 years	$ 52.80	—	5,904	—	5,904
Total				—	123,967	—	1,489,952

(1) These options were repriced as part of the March 2023 Private Placement offering.

11. Stock-Based Compensation and Employee Stock Purchase Program

Stock Incentive Plans

The Company has two equity incentive plans: the 2006 Stock Plan (“2006 Plan”) and the 2015 Omnibus Equity Incentive Plan (“2015 Plan”).

In 2006, the Company adopted the 2006 Plan, which provided for the granting of stock options to executives, employees, and other service providers under terms and provisions established by the Board of Directors. The Company granted non-statutory stock options (“NSOs”) under the 2006 Plan until May 2015, when it was terminated as to future awards, although it continues to govern the terms of options that remain outstanding and were issued under the 2006 Plan. The 2015 Plan became effective upon the Company’s IPO in May 2015 and all shares that were reserved, but not issued, under the 2006 Plan were assumed by the 2015 Plan. Upon effectiveness, the 2015 Plan had 3,860 shares of common stock reserved for future issuance, which included 259 that were transferred to and assumed by the 2015 Plan. The 2015 Plan provides for automatic annual increases in shares available for grant. In addition, shares subject to awards under the 2006 Plan that are forfeited or canceled will be added to the 2015 Plan. The 2015 Plan provides for the grant of incentive stock options (“ISOs”), NSOs, restricted stock awards, stock units, stock appreciation rights, and other forms of equity compensation, all of which may be granted to employees, officers, non-employee directors, and consultants. The exercise price for ISOs and NSOs will be granted at a price per share not less than the fair value of our common stock at the date of grant. Options granted generally vest over a four-year period; however, there might be alternative vesting schedules, as approved by the Board. Options granted, once vested, are generally exercisable for up to 10 years, after grant to the extent vested.

In June 2019, the shareholders approved an amendment to the Company’s 2015 Plan for a one-time increase to the number of shares of common stock that may be issued under the 2015 Plan by 3,000 shares. On February 2, 2022, Stanley Jacot, Jr. was hired as the new president and chief executive officer of the Company. The Company granted Mr. Jacot an inducement stock option to purchase 7,902 shares of the Company’s common stock pursuant to Rule 5635(c)(4) of the Nasdaq Listing Rules. The Company has filed a registration statement on Form S-8 to register the issuance of shares upon exercise of this inducement stock option. The inducement options grants have been issued outside of the 2015 Plan, but are subject to the terms and conditions of the 2015 Plan. As of March 31, 2023, a total of 90,861 shares of common stock were reserved for issuance under the 2015 Plan, of which 37,598 shares of common stock are available for future grant. As of March 31, 2023, a total of 103 and 53,263 options are outstanding under the 2006 and 2015 Plans, respectively. As of December 31, 2022, a total of 103 and 51,421 options were outstanding under the 2006 and 2015 Plans, respectively. A total of 8,477 inducement options were outstanding as of March 31, 2023 and December 31, 2022.

The following is a summary of stock option information and weighted average exercise prices under the Company's stock incentive plans (in thousands, except share data and price per share):

	Shares Subject to Outstanding Options	Weighted-Average Exercise Price Per Share	Aggregate Intrinsic Value
Outstanding — Balance at December 31, 2022	60,002	$ 114.80	$ —
Options granted	2,700	11.17	—
Options exercised	—	—	—
Options forfeited	(858)	47.06	39,054.00
Options expired	—	—	—
Outstanding — Balance at March 31, 2023	61,844	$ 110.91	$ —
Vested and expected to vest — March 31, 2023	56,615	$ 116.59	$ —
Exercisable — March 31, 2023	25,725	$ 194.30	$ —

Aggregate intrinsic value represents the difference between the exercise price of the options and the estimated fair value of the Company's common stock determined by our Board of Directors for each of the respective periods. The intrinsic value of options exercised was $0 for both quarters ended March 31, 2023 and 2022.

As of March 31, 2023, there was $988,000 of unrecognized compensation cost related to unvested stock-based compensation grants that will be recognized over the weighted-average remaining recognition period of 2.2 years.

In determining the fair value of the stock-based awards, the Company uses the Black-Scholes option-pricing model and assumptions discussed below. Each of these inputs is subjective and generally requires significant judgment to determine.

Expected Term—The expected term is the estimated period of time outstanding for stock options granted and was estimated based on a simplified method allowed by the SEC, and defines the term as the average of the contractual term of the options and the weighted-average vesting period for all open employee awards.

Expected Volatility—The historical volatility data was computed using the daily closing prices for the Company's shares during the equivalent period of the calculated expected term of the stock-based awards.

Risk-Free Interest Rate—The risk-free interest rate is based on the interest rate of U.S. Treasuries of comparable maturities on the date the options were granted.

Expected Dividend—The expected dividend yield is based on the Company's expectation of future dividend payouts to common stockholders.

The fair value of stock option awards was estimated at the date of grant using the Black-Scholes option-pricing model with the following weighted-average assumption:

	Three Months Ended March 31,	
	2023	2022
Expected term (years)	5.85	6.08
Expected volatility	124 %	120 %
Risk-free interest rate	3.79 %	1.68 %
Dividend yield	—	—

The Company recognized $212,000 and $260,000 of compensation expense for stock options awards during the three months ended March 31, 2023 and 2022, respectively.

Employee Stock Purchase Plan

The Company's 2015 Employee Stock Purchase Plan ("ESPP") became effective on May 14, 2015. The ESPP allows eligible employees to purchase shares of the Company's common stock at a discount of up to 15% of their eligible compensation through payroll deductions, subject to any plan limitations. After the first offering period, which began on May 14, 2015 and ended on February 1, 2016, the ESPP provides for six-month offering periods, and at the end of each offering period, employees are able to purchase shares at 85% of the lower of the fair market value of the Company's common stock on the first trading day of the offering period or on the last day of the offering period. As of March 31, 2023, the number of shares of common stock reserved for future issuance under the ESPP is 9,194. The ESPP provides for automatic annual increases in the shares available for purchase beginning on January 1, 2016. As of March 31, 2023, 1,563 shares had been issued under the ESPP. The Company recorded $1,000 of ESPP related compensation expense during each of the three months ended March 31, 2023 and 2022.

12. Income Taxes

Income tax expense during interim periods is based on applying an estimated annual effective income tax rate to year-to-date income, plus any significant unusual or infrequently occurring items that are recorded in the interim period. The computation of the annual estimated effective tax rate at each interim period requires certain estimates and significant judgment including, but not limited to, the expected operating income for the year, projections of the proportion of income earned and taxed in various jurisdictions, permanent and temporary differences, and the likelihood of recovering deferred tax assets generated in the current year. The accounting estimates used to compute the provision for income taxes may change as new events occur, more experience is obtained, additional information becomes known, or as the tax environment changes.

The interim financial statement provision for income taxes is different from the amounts computed by applying the United States federal statutory income tax rate of 21%. The Company's effective tax rate was 0.00% for each of the three months ended March 31, 2023 and 2022. The difference between the effective tax rate and the federal statutory rate of 21% was primarily due to the full valuation allowance recorded on the Company's net deferred tax assets.

During the three months ended March 31, 2023, there were no material changes to the Company's uncertain tax positions.

In February 2023, the Company received notification from the Internal Revenue Service that our Archipelago joint venture was selected for audit for the 2021 tax year. The Opening Conference was held on April 24, 2023. Management received the IRS agent's Initial Document Request in April 2023. The Company is currently not under audit for state purposes.

13. Commitments and Contingencies

Leases

The Company leases office and laboratory space, grain storage bins, warehouse space, farmland, and equipment under operating lease agreements having initial lease terms ranging from one to five years, including certain renewal options available to the Company at market rates. The Company also leases land for field trials on a short-term basis. See Note 8.

Legal Matters

From time to time, in the ordinary course of business, the Company may become involved in certain legal proceedings. The Company currently is not a party to any material litigation or other material legal proceedings.

Contingent Liability Related to the Anawah Acquisition

In June 2005, the Company completed its agreement and plan of merger and reorganization with Anawah, to purchase the Anawah's food and agricultural research company through a non-cash stock purchase. Pursuant to the merger with Anawah, and in accordance with the ASC 805 - Business Combinations, the Company incurred a contingent liability not to exceed $5.0 million. This liability represents amounts to be paid to Anawah's previous stockholders for cash collected on revenue recognized by the Company upon commercial sale of certain specific products developed using technology acquired in the purchase. During 2010, the Company ceased activities relating to three of the six Anawah product programs thus, the contingent liability was reduced to $3.0 million. During 2016, one of the programs previously accrued for was abandoned and another program previously abandoned was reactivated. During 2019, the Company determined that one of the technologies was no longer active and decided to abandon the previously accrued program. As of March 31, 2023, the Company continues to pursue or are otherwise liable for a total of two development programs using this technology and believes that the contingent liability is probable. As a result, $2.0 million remains on the condensed consolidated balance sheet as an other noncurrent liability.

Contingent Liability Related to the ISI Acquisition

In August 2020, the Company acquired by merger ISI. A portion of the purchase price consideration for the acquisition in the amount of $280,000 will be recognized in two annual installments, each of up to 3,316 shares of the Company's common stock, subject to the achievement of revenue milestones in 2021 and 2022. The contingent consideration was measured and recorded at fair value. The contingent consideration liability was remeasured quarterly with changes in fair value recorded on the condensed consolidated statements of operations and comprehensive loss. During 2022, the contingent consideration liability was fully written down as the probability of achievement of the 2022 revenue milestone was remote.

Contracts

The Company has entered into contract research agreements with unrelated parties that require the Company to pay certain funding commitments. The initial terms of these agreements range from one to three years in duration and in certain cases are cancelable.

The Company licenses certain technologies via executed agreements ("In-Licensing Agreements") that are used to develop and advance the Company's own technologies. The Company has entered into various In-Licensing Agreements with related and unrelated parties that require the Company to pay certain license fees, royalties, and/or milestone fees. In addition, certain royalty payments ranging from 2% to 15% of net revenue amounts as defined in the In-Licensing Agreements are or will be due.

The Company could be adversely affected by certain actions by the government as it relates to government contract revenue received in prior years. Government agencies, such as the Defense Contract Audit Agency routinely audit and investigate government contractors. These agencies review a contractor's performance under its agreements; cost structure; and compliance with applicable laws, regulations and standards. The agencies also review the adequacy of, and a contractor's compliance with, its internal control systems and policies, including the contractor's purchasing, property, estimating, compensation and management information systems. While the Company's management anticipates no adverse result from an audit, should any costs be found to be improperly allocated to a government agreement, such costs will not be reimbursed, or if already reimbursed, may need to be refunded. If an audit uncovers improper or illegal activities, civil and criminal penalties and administrative sanctions, including termination of contracts, forfeiture of profits, suspension of payments or fines, and suspension or prohibition from doing business with the government could occur. In addition, serious reputational harm or significant adverse financial effects could occur if allegations of impropriety were made against the Company. There currently are routine audits in process relating to government grant revenues.

14. Net Loss per Share

Basic net loss per share is calculated by dividing net loss attributable to common stockholders by the weighted-average number of common shares outstanding during the period and excludes any dilutive effects of stock-based awards and warrants. Diluted net loss per share attributable to common stockholders is computed giving effect to all potentially dilutive common shares, including common stock issuable upon exercise of stock options and warrants. As the Company had net losses during the three months ended March 31, 2023 and 2022, all potentially dilutive common shares were determined to be anti-dilutive.

Securities that were not included in the diluted per share calculations because they would be anti-dilutive were as follows (in shares):

	For the Three Months Ended March 31,	
	2023	2022
Options to purchase common stock	61,844	42,739
Warrants to purchase common stock	268,698	283,751
Preferred investment options	1,489,952	—
Total	1,820,494	326,490

15. Related-Party Transactions

The Company's related parties include Moral Compass Corporation ("MCC") and the John Sperling Foundation ("JSF"). The rights to the intellectual property owned by Blue Horse Labs, Inc. ("BHL") were assigned to its sole shareholder, the John Sperling Revocable Trust ("JSRT") due to BHL's dissolution and then subsequently to the JSF. The JSF is deemed a related party of the Company because MCC, the Company's largest stockholder, and the JSF share common officers and directors.

JSF receives a single digit royalty from the Company when revenue has been collected on product sales or for license payments from third parties that involve certain intellectual property developed under research funding originally from BHL. Royalty fees due to JSF were $15,000 and $48,000 as of March 31, 2023 and December 31, 2022, respectively, and are included in the condensed consolidated balance sheets as amounts due to related parties.

16. Subsequent Events

Management has evaluated subsequent events through May 15, 2023, the date that the financial statements were available to be issued.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Special Note Regarding Forward-Looking Statements

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 the related notes to those statements included herein. In addition to historical financial information, this report contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those discussed in the forward-looking statements. The statements contained in this report that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Forward-looking statements are often identified by the use of words such as, but not limited to, "anticipate," "believe," "can," "continue," "could," "estimate," "expect," "intend," "may," "plan," "project," "seek," "should," "strategy," "target," "will," "would" and similar expressions or variations intended to identify forward-looking statements. These statements are based on the beliefs and assumptions of our management based on information currently available to management. Such forward-looking statements are subject to risks, uncertainties and other important factors that could cause actual results and the timing of certain events to differ materially from future results expressed or implied by such forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those identified below and those discussed in the section titled "Risk Factors" included in the most recent Annual Report on Form 10-K filed by the Company. Furthermore, such forward-looking statements speak only as of the date of this report. Except as required by law, we undertake no obligation to update any forward-looking statements to reflect events or circumstances after the date of such statements.

Solely for convenience, the trademarks, service marks and trade names referred to in this report may appear without the ®, TM, or SM symbols, but such references do not constitute a waiver of any rights that might be associated with the respective trademarks, service marks, or trade names.

Overview

We are a producer and marketer of innovative, plant-based food and beverage products. Our history as a leader in science-based approaches to developing high value crop improvements, primarily in wheat, designed to enhance farm economics by improving the performance of crops in the field, as well as their value as food ingredients, has laid the foundation for our path forward. We have used non-genetically modified advanced breeding techniques to develop these proprietary innovations which we are now commercializing through the sales of seed and grain, food ingredients and products, trait licensing and royalty agreements. The acquisition of the assets of Live Zola, LLC ("Zola") added coconut water to our portfolio of products.

Our commercial strategy is to satisfy consumer nutrition demands with the superior functional benefits our crops deliver directly from the farm, enabling us to share premium economics throughout the ag-food supply chain and to build a world-class estate of high value traits and varieties. The acquisition of the Zola brand allows us to broaden our reach within the beverage sector.

It is also estimated by the U.S. Department of Agriculture ("USDA"), that approximately one-fifth of the FDA recommended calories consumed by people in the US are from wheat. Therefore, the market opportunity for nutritional improvements in wheat are significant not only because the wheat market itself is vast, but also because of the "share of stomach" wheat represents. Considering that most people today are not getting enough fiber or protein in their daily diets, the superior nutrient density of our non-GMO GoodWheat™ ("GoodWheat") technology can improve the dietary intake of average consumers, by increasing their fiber and protein consumption without changing the way they eat. We believe this proprietary advantage gives GoodWheat the potential to become a global standard in wheat.

Our Growth Strategy

We believe there are significant opportunities to grow our business by executing the following elements of our strategy:

- ***Accelerate the monetization of our GoodWheat™ wheat trait portfolio.*** Our proprietary intellectual property ("IP") with multiple non-GMO wheat traits have clear functional benefits, and we will continue to build partnerships across the wheat value chain. This will include launching GoodWheat™ into multiple categories where our wheat can provide a compelling point-of-difference at attractive margins. We will continue to acquire, develop and retain the requisite management and industry experience to fully participate in, and control, the route to market for our high value food ingredients.
- ***Evaluate acquisitive growth opportunities.*** We intend to evaluate potential acquisitions that will allow us to bring the GoodWheat value proposition to an existing business. We believe there is a significant opportunity to scale our business faster by purchasing an existing business in a new wheat-based category outside of pasta.

- ***Scale Zola through retail expansion.*** We plan to expand distribution of our Zola coconut water brand through mass market retailers and grocery store chains. Based on our research, consumers prefer the clean, crisp taste of Zola to that of other leading coconut water brands. As a result, we plan to refresh our packaging, launch new innovation and continue to invest in effective brand-building activities.

Arcadia Wellness, LLC

In May 2021, our wholly owned subsidiary Arcadia Wellness, LLC ("Arcadia Wellness" or "AW"), acquired the businesses of Eko, Lief, and Zola. The acquisition included consumer CBD brands like Soul Spring™, a CBD-infused botanical therapy brand in the natural category, Saavy Naturals™, a line of natural body care products and ProVault™, a CBD-infused sports performance formula made with natural ingredients, providing effective support and recovery for athletes. Also included in the purchase is Zola, a coconut water sourced exclusively with sustainably grown coconuts from Thailand. In July 2022, the Company licensed Saavy Naturals™ to Radiance Beauty and Wellness, Inc. ("Radiance Beauty").

Our Product Portfolio

GoodWheat™ Consumer Products

In June 2022, we launched our GoodWheat pasta in five varieties – penne, spaghetti, fettuccine, elbows and rotini – in select retailers nationwide and on Amazon. Our pasta delivers 4 times the fiber of traditional wheat pasta with 9g of protein per serving and no sacrifice on taste. In fact, our research shows that GoodWheat pasta scores at parity on taste with leading wheat pasta competitors and significantly outscores market leading vegetable-based pastas. Made with only our USA farm grown wheat, GoodWheat pasta meets consumers' preference for clean labels and transparent sourcing. And, in December of 2022, GoodWheat received the American Heart Association's Heart-Check mark on all of our pasta products. With its high fiber, lower sodium and zero saturated fat, GoodWheat meets the criteria for a heart-healthy pasta and provides consumers with a better-for-you option that delivers superior nutrition with the taste and texture of traditional pasta.

Most Americans suffer from a significant fiber deficiency. Less than 10 percent of women and less than 3 percent of men get enough fiber in their daily diets. The recommended daily value of fiber is 25g for women and children, and 38g for men according to the May 2021 Food and Health Survey by the International Food Information Council. One serving of GoodWheat Pasta gets your fiber closer to your daily need, delivering 8g of fiber, which accounts for 32 percent of the daily value of fiber needs for women and children, and 20 percent for men.

In 2023, we plan to expand the GoodWheat portfolio with the launch of innovative, new wheat-based products in additional categories, offering consumers more options to improve their fiber intake at multiple mealtimes throughout the day.

Zola Coconut Water

Zola is a pure, natural, 100% coconut water with a crisp, clean taste that's lightly sweet and refreshing. Naturally hydrating and never from concentrate, Zola is Non-GMO Project Verified and only contains 60 calories per serving. In taste tests, Zola beats competitors 2 to 1 and is the best-tasting way to rehydrate, reset and reenergize.

CBD Body Care ProVault Topical Pain Relief

Our portfolio currently consists of two body care brands that both contain CBD. The first brand is ProVault, a muscle and joint pain relief product that is formulated with THC-free CBD isolate along with a proprietary blend of natural ingredients and fast-acting cooling agents. The second brand is SoulSpring, a CBD-infused line of bath and body products that includes nourishing botanicals and minerals.

The market for CBD products has been under pressure primarily due to regulatory uncertainty. Given our strategic focus on food and beverage products, we are currently in the process of exploring strategic alternatives for our body care brands.

Components of Our Statements of Operations Data

Revenues

We derive our revenues primarily from product sales and royalties.

Product revenues

Our product revenues consist primarily of sales of Arcadia Wellness products, GoodWheat grain and pasta, and GLA products. We recognize revenue from product sales when control of the product is transferred to third-party distributors and manufacturers, collectively “our customers,” which generally occurs upon delivery. Our revenues fluctuate depending on the timing of shipments of product to our customers and are reported net of estimated chargebacks, returns and losses.

Operating Expenses

Cost of revenues

Cost of revenues relates to the sale of Arcadia Wellness, GoodWheat, and GLA products and consists of the cost of raw materials, including internal and third-party services costs related to procuring, processing, formulating, packaging and shipping our products, as well as in-licensing and royalty fees, any adjustments or write-downs to inventory or prepaid production costs.

Research and development expenses ("R&D")

Research and development expenses consist of costs incurred in the development and testing of our products and other products in development incorporating our traits. These expenses currently consist primarily of fees paid to product formulation consultants and are expensed as incurred. Additionally, we are required from time to time to make certain milestone payments in connection with the development of technologies in-licensed from third parties. Our research and development expenses may fluctuate from period to period.

Gain on sale of property and equipment, net

Gain on sale of fixed assets includes gains from the sale of tangible assets sold above their net book value.

Selling, general and administrative expenses

Selling, general and administrative expenses consist primarily of employee costs, professional service fees, broker and sales commission fees, and overhead costs. Our selling, general, and administrative expenses may fluctuate from period to period. In connection with our commercialization activities for our consumer products, we expect to increase our investments in sales and marketing, including additional consulting fees.

Interest income (expense)

Interest income consists interest income on our cash and cash equivalents and investments.

Valuation loss on March 2023 PIPE

Valuation loss on March 2023 PIPE includes the fair value in excess of gross proceeds and the increase in fair value related to the re-pricing of existing warrants.

Change in the estimated fair value of common stock warrant and option liabilities

Change in the estimated fair value of common stock warrant and option liabilities is comprised of the fair value remeasurement of the liabilities associated with our financing transactions.

Issuance and offering costs allocated to liability classified options

Issuance and offering costs generally include placement agent, legal, advisory, accounting and filing fees related to financing transactions.

Income Tax Provision

Our income tax provision has not been historically significant, as we have incurred losses since our inception. The provision for income taxes consists of state and foreign income taxes. Due to cumulative losses, we maintain a valuation allowance against our U.S. deferred tax assets as of March 31, 2023 and December 31, 2022. We consider all available evidence, both positive and negative, including but not limited to: earnings history, projected future outcomes, industry and market trends, and the nature of each of the deferred tax assets in assessing the extent to which a valuation allowance should be applied against our U.S. deferred tax assets.

Results of Operations

Comparison of the Three Months Ended March 31, 2023 and 2022

	Three Months Ended March 31, 2023	Three Months Ended March 31, 2022	$ Change	% Change
	(In thousands except percentage)			
Revenues:				
Product	$ 1,509	$ 3,170	$ (1,661)	(52)%
Royalty	—	50	(50)	(100)%
Total revenues	1,509	3,220	(1,711)	(53)%
Operating expenses (income):				
Cost of revenues	825	3,458	(2,633)	(76)%
Research and development	359	395	(36)	(9)%
Change in fair value of contingent consideration	—	(31)	31	(100)%
Gain on sale of property and equipment	(19)	(328)	309	(94)%
Selling, general and administrative	4,392	4,349	43	1%
Total operating expenses	5,557	7,843	(2,286)	(29)%
Loss from operations	(4,048)	(4,623)	575	12%
Interest income (expense)	198	(1)	199	(19900)%
Other income, net	32	14	18	129%
Valuation loss on March 2023 PIPE	(6,076)	—	(6,076)	100%
Change in fair value of common stock warrant and option liabilities	940	—	940	100%
Issuance and offering costs allocated to liability classified options	(430)	—	(430)	100%
Net loss	(9,384)	(4,610)	(4,774)	104%
Net loss attributable to non-controlling interest	—	(122)	122	(100)%
Net loss attributable to common stockholders	$ (9,384)	$ (4,488)	$ (4,896)	109%

Revenues

Product revenues accounted for 100% and 98% of total revenues during the three months ended March 31, 2023 and 2022, respectively. Product revenues decreased $1.7 million, or 52%, during the three months ended March 31, 2023 compared to the same period in 2022. Revenues in the first quarter of 2022 included $1.8 million of GoodWheat grain sales and sales of body care products that are no longer part of the Arcadia product portfolio.

Cost of revenues

Cost of revenues decreased by $2.6 million, or 76%, during the three months ended March 31, 2023 compared to the same period in 2022. Cost of revenues in the first quarter of 2022 included GoodWheat grain sold at cost, low-margin body care product sales, and higher inventory write-downs. Gross profit, calculated as total revenues less cost of revenues, was $684,000 during the three months ended March 31, 2023 compared to gross loss of $238,000 during the three months ended March 31, 2022. The increase in the gross profit was driven by the absence of GoodWheat grain sold at cost, the focus on higher-margin products, and lower inventory write-downs during the three months ended March 31, 2023.

Research and development

Research and development expenses decreased by $36,000, or 9%, during the three months ended March 31, 2023 compared to the same period in 2022 primarily driven by the Company's continued focus on commercialization, which has led to lower employee-related expenses, and related activity costs as we right-sized our research teams.

Gain on sale of property and equipment

During the three months ended March 31, 2023 and 2022, the Company sold property and equipment for net proceeds exceeding book value by $19,000 and $328,000, respectively.

Selling, general, and administrative

Selling, general, and administrative expenses increased by $43,000, or 1%, during the three months ended March 31, 2023 compared to the same period in 2022 despite a 43% increase in marketing expenses in 2023.

Interest income (expense)

During the three months ended March 31, 2023, the Company recognized interest income of $198,000 from investments as compared to interest expense of $1,000 during the same period in 2022.

Other income, net

During the three months ended March 31, 2023, the Company recognized other income of $32,000.

Valuation loss on March 2023 PIPE

During the three months ended March 31, 2023, the Company recognized a $6.1 million valuation loss related to the March 2023 PIPE financing transaction. The valuation loss includes the fair value in excess of gross proceeds and the increase in fair value related to the re-pricing of existing warrants.

Change in the estimated fair value of common stock warrant and option liabilities

The change in the estimated fair value of common stock warrant and option liabilities was $940,000 during the three months ended March 31, 2023 related to the change in the estimated fair value of the liability classified preferred investment options issued in connection with the March 2023 PIPE and August 2022 Registered Direct Offering financing transactions.

Issuance and offering costs allocated to liability classified options

Issuance and offering costs were $430,000 during the three months ended March 31, 2023 and were related to the liability classified options issued in the March 2023 PIPE financing transaction.

Seasonality

We and our commercial partners operate in different geographies around the world and conduct field trials used for data generation, which must be conducted during the appropriate growing seasons for particular crops and markets. Demand for our consumer body care products tends to vary with major holidays and demand for coconut water products is generally higher in the summer months.

The level of seasonality in our business overall is difficult to evaluate at this time due to our relatively limited number of commercialized products, our expansion into new geographical markets and our introduction of new products and traits.

Liquidity & Capital Resources

We have funded our operations primarily with the net proceeds from our private and public offerings of our equity securities and debt, as well as proceeds from the sale of our products and payments under license agreements. Our principal use of cash is to fund our operations, which are primarily focused on commercializing our products. Our contractual obligations are primarily related to our operating leases for facilities, land and equipment. As of March 31, 2023, we had cash and cash equivalents of $23.0 million. For the three months ended March 31, 2023, the Company had a net loss of $9.4 million and net cash used in operations of $3.5 million. For the twelve months ended December 31, 2022, the Company had net losses of $15.6 million and net cash used in operations of $14.0 million.

Going Concern

We believe that our existing cash and cash equivalents will not be sufficient to meet our anticipated cash requirements for at least the next 12-18 months from the issuance date of these financial statements, and thus raises substantial doubt about the Company's ability to continue as a going concern. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

We may seek to raise additional funds through debt or equity financings, if necessary. We may also consider entering into additional partner arrangements. Any sale of additional equity would result in dilution to our stockholders. Our incurrence of debt would result in debt service obligations, and the instruments governing our debt could provide for additional operating and financing covenants that would restrict our operations. If we require additional funds and are not able to secure adequate additional funding, we may be forced to reduce our spending, extend payment terms with our suppliers, liquidate assets, or suspend or curtail planned product launches. Any of these actions could materially harm our business, results of operations and financial condition.

Liquidity

The following table summarizes total current assets, current liabilities and working capital for the dates indicated (in thousands):

	As of March 31, 2023	As of December 31, 2022
Current assets	$ 27,205	$ 25,398
Current liabilities	4,097	4,209
Working capital surplus	$ 23,108	$ 21,189

Cash Flows

The following table summarizes our cash flows for the periods indicated (in thousands):

	Three Months Ended March 31,	
	2023	2022
Net cash (used in) provided by:		
Operating activities	$ (3,466)	$ (4,885)
Investing activities	315	747
Financing activities	5,505	4
Net increase (decrease) in cash	$ 2,354	$ (4,134)

Cash flows from operating activities

Cash used in operating activities for the three months ended March 31, 2023, was $3.5 million. With respect to our net loss of $9.4 million, non-cash charges including $430,000 of issuance and offering costs, $6.1 million of valuation loss recognized for the March 2023 PIPE, $212,000 of stock-based compensation, $180,000 of lease amortization, $71,000 of depreciation, $23,000 of write-downs of inventory, and adjustments in our working capital accounts of $76,000, were offset by the change in fair value of common stock warrant and option liabilities of $940,000, operating lease payments of $191,000 and a gain on disposal of property and equipment of $19,000.

Cash used in operating activities for the three months ended March 31, 2022, was $4.9 million. With respect to our net loss of $4.6 million, non-cash charges including $260,000 of stock-based compensation, $166,000 of lease amortization, $368,000 of write-downs of inventory, and $149,000 of depreciation were offset by adjustments in our working capital accounts of $692,000, $328,000 of gain on disposal of property and equipment, other non-cash income from the change in fair value of contingent consideration of $31,000, and operating lease payments of $180,000.

Cash flows from investing activities

Cash provided by investing activities for the three months ended March 31, 2023 consisted of proceeds of $30,000 from sale of property and equipment as well as proceeds of $285,000 from sale of Verdeca.

Cash provided by investing activities for the three months ended March 31, 2022 consisted of $787,000 of proceeds from sales of property and equipment, partially offset by $40,000 of purchases of property and equipment.

Cash flows from financing activities

Cash provided by financing activities for the three months ended March 31, 2023 consisted of gross proceeds of $6.0 million from the March 2023 PIPE financing transaction and proceeds from the purchase of ESPP shares of $5,000, which were offset by payments of transaction costs related to the March 2023 PIPE financing transaction of $497,000.

Cash provided by financing activities for the three months ended March 31, 2022 consisted of proceeds from the purchase of ESPP shares of $4,000.

Off-Balance Sheet Arrangements

Since our inception, we have not engaged in any off-balance sheet arrangements, including the use of structured finance, special purpose entities, or variable interest entities other than Verdeca, which was disposed of in November 2020.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our financial statements, which have been prepared in accordance with GAAP. The preparation of these 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 revenue generated, and expenses incurred during the reporting periods. Our estimates are based on our 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. Actual results may differ from these estimates under different assumptions or conditions.

We consider our critical accounting policies and estimates to be revenue recognition, determination of the provision for income taxes, and net realizable value of inventory.

ITEM 3: QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Not Required.

ITEM 4: CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We maintain “disclosure controls and procedures,” as such term is defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, or Exchange Act, that are designed to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in Securities and Exchange Commission rules and forms, and that such information is accumulated and communicated to our management, including our President and Chief Executive Officer and our Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure. In designing and evaluating our disclosure controls and procedures, management recognized that disclosure controls and procedures, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the disclosure controls and procedures are met. Our disclosure controls and procedures have been designed to meet reasonable assurance standards. Additionally, in designing disclosure controls and procedures, our management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible disclosure controls and procedures. The design of any disclosure controls and procedures also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Based on their evaluation as of the end of the period covered by this Quarterly Report on Form 10-Q, our President and Chief Executive Officer and our Chief Financial Officer have concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting (as such term is defined in Rule 13a-15(f) under the Exchange Act) identified in connection with the evaluation identified above that occurred during the quarter ended March 31, 2023 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 currently are not a party to any material litigation or other material legal proceedings. From time to time, we may be subject to legal proceedings and claims in the ordinary course of business.

ITEM 1A. RISK FACTORS

In addition to the other information set forth in this Quarterly Report, you should carefully consider the factors discussed in Part I, “Item 1A. Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2022, which could materially affect our business, financial condition, liquidity or future results. The risks described in our Annual Report on Form 10-K are not the only risks facing our company. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition, liquidity or future results.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

Information concerning our sales of unregistered securities during the quarter ended March 31, 2023, has previously been reported in Current Reports on Form 8-K that we filed during that quarter.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM 5. OTHER INFORMATION

None.

ITEM 6. EXHIBITS

The following exhibits are attached hereto or are incorporated herein by reference.

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation	8-K	001-37383	3.1	5/26/2015	
3.2	Amendment to the Amended and Restated Certificate of Incorporation	8-K	001-37383	3.1	2/28/2023	
3.3	Certificate of Designation of Series A Preferred Stock	8-K	001-37383	3.1	12/8/2022	
4.1	Form of Pre-Funded Warrant	8-K	001-37383	4.1	3/3/2023	
4.2	Form of Series A Preferred Investment Option	8-K	001-37383	4.2	3/3/2023	
4.3	Form of Series B Preferred Investment Option	8-K	001-37383	4.3	3/3/2023	
4.4	Form of Placement Agent Preferred Investment Option	8-K	001-37383	4.4	3/3/2023	
10.1	Form of Securities Purchase Agreement	8-K	001-37383	10.1	3/3/2023	
10.2	Form of Registration Rights Agreement	8-K	001-37383	10.2	3/3/2023	
10.3	Form of Investment Option Amendment Agreement	8-K	001-37383	10.3	3/3/2023	
10.4*	Employment Letter and Severance and Change in Control Agreement for Thomas J. Schaefer	8-K/A	001-37383	10.1	1/5/2023	
31.1	Principal Executive Officer's Certifications Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					X
31.2	Principal Financial Officer's Certifications Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					X
32.1(1)	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002					X
32.2(1)	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002					X
101.INS	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document					X
101.SCH	Inline XBRL Taxonomy Extension Schema Document					X
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document					X
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document					X
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document					X
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document					X
104.1	Cover page from the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2023, formatted in inline XBRL (and contained in Exhibit 101)					X

* Indicates a management contract or compensatory plan or arrangement

(1) This certification is deemed not filed for purpose of Section 18 of the Exchange Act or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act.

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.

	Arcadia Biosciences, Inc.	
May 15, 2023	By:	/s/ STANLEY E. JACOT, JR.
		Stanley E. Jacot, Jr.
		President and Chief Executive Officer
May 15, 2023	By:	/s/ THOMAS J. SCHAEFER
		Thomas J. Schaefer
		Chief Financial Officer

Exhibit 31.1

CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a)/15d-14(a)
AS ADOPTED PURSUANT TO SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002

I, Stanley E. Jacot, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arcadia Biosciences, Inc. for the period ended March 31, 2023;

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 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: May 15, 2023

/s/ STANLEY E. JACOT, JR.
Stanley E. Jacot, Jr.
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a)/15d-14(a)
AS ADOPTED PURSUANT TO SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002

I, Thomas J. Schaefer, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arcadia Biosciences, Inc. for the period ended March 31, 2023;

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 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: May 15, 2023

/s/ THOMAS J. SCHAEFER
Thomas J. Schaefer
Chief Financial Officer
(Principal Financial 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 accompanying Quarterly Report of Arcadia Biosciences, Inc. (the "Company"), on Form 10-Q for the quarter ended March 31, 2023 (the "Report"), I, Stanley E. Jacot, Jr., President and Chief Executive Officer of the Company, hereby certify pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002 that:

(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: May 15, 2023

/s/ STANLEY E. JACOT, JR.
Stanley E. Jacot, Jr.
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 32.2

**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 accompanying Quarterly Report of Arcadia Biosciences, Inc. (the "Company"), on Form 10-Q for the quarter ended March 31, 2023 (the "Report"), I, Thomas J. Schaefer, Chief Financial Officer of the Company, hereby certify pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002 that:

(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: May 15, 2023

/s/ THOMAS J. SCHAEFER
Thomas J. Schaefer
Chief Financial Officer
(Principal Financial Officer)