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, 2020

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 **(State or other jurisdiction of incorporation or organization)**	**81-0571538** **(I.R.S. Employer Identification No.)**
202 Cousteau Place, Suite 105 **Davis, CA** **(Address of Principal Executive Offices)**	**95618** **(Zip Code)**

Registrant's telephone number, including area code: (530) 756-7077

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, 2020, the registrant had 8,654,095 shares of common stock outstanding, $0.001 par value per share.

Arcadia Biosciences, Inc.

FORM 10-Q FOR THE QUARTER ENDED March 31, 2020

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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, 2020	December 31, 2019
Assets		
Current assets:		
Cash and cash equivalents	$ 12,973	$ 8,417
Short-term investments	3,045	16,915
Accounts receivable	309	602
Inventories, net — current	5,971	1,794
Prepaid expenses and other current assets	1,460	712
Total current assets	23,758	28,440
Property and equipment, net	2,540	1,799
Right of use asset	5,654	1,963
Inventories, net — noncurrent	273	364
Other noncurrent assets	23	8
Total assets	$ 32,248	$ 32,574
Liabilities and stockholders’ equity		
Current liabilities:		
Accounts payable and accrued expenses	$ 4,912	$ 4,685
Amounts due to related parties	16	40
Notes payable — current	31	24
Unearned revenue — current	17	42
Operating lease liability — current	526	611
Other current liabilities	306	306
Total current liabilities	5,808	5,708
Notes payable — noncurrent	130	107
Operating lease liability — noncurrent	5,312	1,497
Common stock warrant liabilities	6,775	14,936
Other noncurrent liabilities	2,000	2,000
Total liabilities	20,025	24,248
Commitments and contingencies (Note 12)		
Stockholders’ equity:		
Common stock, $0.001 par value—150,000,000 shares authorized as of March 31, 2020 and December 31, 2019; 8,654,095 and 8,646,149 shares issued and outstanding as of March 31, 2020 and December 31, 2019, respectively	49	49
Additional paid-in capital	215,612	214,826
Accumulated other comprehensive income	—	1
Accumulated deficit	(204,646)	(207,171)
Total Arcadia Biosciences stockholders’ equity	11,015	7,705
Non-controlling interest	1,208	621
Total stockholders' equity	12,223	8,326
Total liabilities and stockholders’ equity	$ 32,248	$ 32,574

See accompanying notes to the unaudited condensed consolidated financial statements.

Arcadia Biosciences, Inc.

Condensed Consolidated Statements of Operations and Comprehensive Income (Loss)

(Unaudited)

(In thousands, except share and per share data)

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
Revenues:		
Product	$ 154	$ 107
License	100	—
Royalty	30	—
Contract research and government grants	25	51
Total revenues	309	158
Operating expenses:		
Cost of product revenues	132	59
Research and development	2,244	1,505
Selling, general and administrative	3,723	2,812
Total operating expenses	6,099	4,376
Loss from operations	(5,790)	(4,218)
Interest expense	(3)	—
Other income, net	72	120
Change in fair value of common stock warrant liabilities	8,161	(8,495)
Net income (loss) before income taxes	2,440	(12,593)
Income tax provision	(17)	(19)
Net income (loss)	2,423	(12,612)
Net loss attributable to non-controlling interest	(102)	—
Net income (loss) attributable to common stockholders	$ 2,525	$ (12,612)
Net income (loss) per share attributable to common stockholders:		
Basic and diluted	$ 0.29	$ (2.64)
Weighted-average number of shares used in per share calculations:		
Basic	8,651,213	4,776,540
Diluted	8,674,610	4,776,540
Other comprehensive loss, net of tax		
Unrealized losses on available-for-sale securities	(1)	—
Other comprehensive loss	(1)	—
Comprehensive income (loss) attributable to common stockholders	$ 2,524	$ (12,612)

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	Accumulated Other Comprehensive	Non-Controlling	Total Stockholders'
	Shares	Amount	Capital	Deficit	(Loss) Income	Interest	Equity
Balance at December 31, 2019	8,646,149	$ 49	$ 214,826	$ (207,171)	$ 1	$ 621	$ 8,326
Issuance of shares related to employee stock purchase plan	7,946	—	14	—	—	—	14
Stock-based compensation	—	—	772	—	—	—	772
Unrealized losses on available-for-sale securities	—	—	—	—	(1)	—	(1)
Non-controlling interest contributions	—	—	—	—	—	689	689
Net income (loss)	—	—	—	2,525	—	(102)	2,423
Balance at March 31, 2020	8,654,095	$ 49	$ 215,612	$ (204,646)	$ —	$ 1,208	$ 12,223

	Common Stock		Additional Paid-In	Accumulated	Total Stockholders'
	Shares	Amount	Capital	Deficit	Equity
Balance at December 31, 2018	4,774,919	$ 45	$ 191,136	$ (178,366)	$ 12,815
Issuance of shares related to employee stock purchase plan	2,500	—	8	—	8
Stock-based compensation	—	—	422	—	422
Net loss	—	—	—	(12,612)	(12,612)
Balance at March 31, 2019	4,777,419	$ 45	$ 191,566	$ (190,978)	$ 633

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,	
	2020	**2019**
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net income (loss)	$ 2,423	$ (12,612)
Adjustments to reconcile net income (loss) to cash used in operating activities:		
Change in fair value of common stock warrant liabilities	(8,161)	8,495
Depreciation	74	34
Lease amortization	223	172
Net amortization of investment premium	(39)	(39)
Stock-based compensation	772	422
Write down of inventory	59	—
Changes in operating assets and liabilities:		
Accounts receivable	293	86
Inventories	(4,145)	39
Prepaid expenses and other current assets	(748)	200
Other noncurrent assets	(15)	—
Accounts payable and accrued expenses	227	(538)
Amounts due to related parties	(24)	(16)
Unearned revenue	(25)	(40)
Operating lease payments	(184)	(172)
Net cash used in operating activities	(9,270)	(3,969)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Purchases of property and equipment	(778)	(88)
Purchases of investments	(1,292)	(6,690)
Proceeds from sales and maturities of investments	15,200	9,200
Net cash provided by investing activities	13,130	2,422
CASH FLOWS FROM FINANCING ACTIVITIES:		
Payments of offering costs relating to June 2018 Offering	—	(16)
Payments of deferred offering costs	—	(5)
Principal payments on notes payable	(7)	—
Proceeds from ESPP purchases	14	8
Capital contributions received from non-controlling interest	689	—
Net cash provided by (used in) financing activities	696	(13)
Net increase (decrease) in cash and cash equivalents	4,556	(1,560)
Cash and cash equivalents — beginning of period	8,417	11,998
Cash and cash equivalents — end of period	$ 12,973	$ 10,438
SUPPLEMENTAL DISCLOSURES OF CASH FLOW INFORMATION:		
Cash paid for income taxes	$ —	$ 2
Cash paid for interest	$ 3	$ —
NONCASH INVESTING AND FINANCING ACTIVITIES:		
Fixed assets acquired with notes payable	$ 37	$ —
Offering costs in accounts payable and accrued expenses at end of period	$ —	$ 7
Deferred offering costs in accounts payable and accrued expenses at end of period	$ —	$ 18
Right of use assets obtained in exchange for new operating lease liabilities	$ 3,836	$ 2,328
Purchases of fixed assets included in accounts payable and accrued expenses	$ —	$ 13

See accompanying notes to the unaudited condensed consolidated financial statements.

1. Description of Business and Basis of Presentation

Organization

Arcadia Biosciences, Inc. (the "Company") was incorporated in Arizona in 2002 and maintains its headquarters in Davis, California, with additional facilities in Phoenix, Arizona, American Falls, Idaho, and Molokai, Hawaii. The Company was reincorporated in Delaware in March 2015.

We are a leader in science-based approaches to developing high value crop productivity traits primarily in hemp, wheat, and soybean, designed to enhance farm economics by improving the performance of crops in the field, as well as their value as food ingredients, health and wellness products, and their viability for industrial applications. We use state of the art gene-editing technology and advanced breeding techniques to develop these proprietary innovations which we are beginning to monetize through a number of methods including seed and grain sales, product extract sales, trait licensing and royalty agreements.

In February 2012, the Company formed Verdeca LLC ("Verdeca," see Note 5), which is jointly owned with Bioceres, Inc. ("Bioceres"), a U.S. wholly owned subsidiary of Bioceres, S.A., an Argentine corporation. Bioceres, S.A. is an agricultural investment and development cooperative. Verdeca**,** which is consolidated by the Company, was formed to develop and deregulate soybean varieties using both partners' agricultural technologies.

On August 9, 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 new partnership, Archipelago Ventures Hawaii, LLC ("Archipelago"), combines the Company's extensive genetic expertise and resources with Legacy's experience in hemp extraction and sales.

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, Verdeca and Archipelago. Certain prior year amounts have been reclassified to conform to the current year presentation.

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 Verdeca, which is a VIE. Accordingly, the Company consolidates the entity in the condensed consolidated financial statements after eliminating intercompany transactions. The Company evaluates its relationships with its VIEs upon the occurrence of certain significant events that affect the design, structure or other factors pertinent to the primary beneficiary determination. Verdeca LLC had no operations for the three months ended March 31, 2020 and 2019, respectively, and had no assets or liabilities as of March 31, 2020 and December 31, 2019, respectively.

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 the entity 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 $102,000 is recorded as an adjustment to net income to arrive at net income attributable to common stockholders for the three months ended March 31, 2020. The non-controlling partner's equity interests are presented as non-controlling interests on the condensed consolidated balance sheets as of March 31, 2020.

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, 2019 included in the Company's Annual Report on Form 10-K, filed with the SEC on March 25, 2020.

Liquidity, Capital Resources, and Going Concern

As of March 31, 2020, the Company had an accumulated deficit of $204.6 million, cash and cash equivalents of $13.0 million and short-term investments of $3.0 million. For the three months ended March 31, 2020, the Company had net income of $2.4 million and net cash used in operations of $9.3 million. For the twelve months ended December 31, 2019, the Company had net losses of $28.9 million and net cash used in operations of $17.2 million.

With cash and cash equivalents of $13.0 million and short-term investments of $3.0 million as of March 31, 2020, the Company believes that its existing cash, cash equivalents and investments will be insufficient to meet its anticipated cash requirements for at least through May 2021, 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, if necessary and available. The Company may also consider entering into additional partner arrangements. The sale of additional equity would result in dilution to the Company's stockholders and could have unfavorable terms. 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 could restrict operations. If the Company 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 development programs or operations. Any of these actions could materially harm the business, results of operations and financial condition.

At this time, there is significant uncertainty relating to the trajectory of the novel coronavirus outbreak ("COVID-19") and impact of related responses. The continued spread of the outbreak could materially harm our business, results of operations, and financial condition. Due to this uncertainty and plans outside of management's control, we may not be able to achieve and implement such plans within one year after the date that the financial statements are issued to address the substantial doubt that exists.

2. Recent Accounting Pronouncements

In June 2016, the FASB issued 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 is currently evaluating the impact of the adoption of ASU No. 2016-13 on the condensed consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-13 *Fair Value Measurement (Topic 820) – Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement*. The amendments affect any entity required to make disclosures about recurring or nonrecurring fair value measurements. The amendments were effective for all entities for fiscal years beginning after December 15, 2019. The Company adopted ASU No. 2018-13 on January 1, 2020 and expanded its disclosures for significant unobservable inputs used to develop Level 3 fair value measurements. There was no impact on the condensed consolidated financial statements. See Note 4.

In December 2019, the FASB issued ASU No. 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes.* The amendments simplify the accounting for income taxes by removing certain exceptions to the general principles in Topic 740 and clarifying other areas of existing guidance. The amendments are effective for all entities for fiscal years beginning after December 15, 2020. The Company is currently evaluating the impact of the adoption of ASU No. 2019-12 on the condensed consolidated balance sheets, statements of operations and comprehensive income (loss), or statements of cash flows.

In April 2020, the FASB issued a staff question-and-answer ("Q&A") document to respond to frequently asked questions about the accounting for lease concessions related to the effects of the COVID-19 pandemic. Under current GAAP, subsequent changes to lease payments that are not stipulated in the original lease contract are generally accounted for as lease modifications under Topic 842. The Q&A allows companies to make an accounting policy election to not evaluate lease concessions related to the effects of the COVID-19 pandemic as lease modifications. Entities that make this election then need to decide whether to apply the lease modification guidance in ASC 842 to the concession or account for the concession as if it were contemplated as part of the existing contract. The Company is currently evaluating its option to make this accounting policy election.

3. Inventory

Inventory costs are tracked on a lot-identified basis and are included as cost of product 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 based upon estimates about future demand from the Company's customers and distributors and market conditions. The Company recorded write-downs of wheat inventory of $59,000 for the three months ended March 31, 2020. There were no such write-downs for the three months ended March 31, 2019.

The inventories—current line item on the balance sheet represents inventory forecasted to be sold or used in production in the next 12 months, as of the balance sheet date, and consists primarily of consists of the cost of GoodWheat seed, grain, and flour, GLA oil, and hemp seed. The inventories—noncurrent line item represents inventory expected to be used in production or sold beyond the next 12 months, as of the balance sheet date, and consists primarily of GLA oil and seed.

Raw materials inventories consist primarily of the cost to purchase hemp seeds and GLA seed production costs incurred by our contracted cooperators. Goods in process inventories consist of costs to process hemp seed, hemp seed production costs incurred by Archipelago, grower fees for soybeans, and GoodWheat seed and grain. Finished goods inventories consist of GoodWheat products and GLA oil that are available for sale.

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

	March 31, 2020	December 31, 2019
Raw materials	$ 240	$ 67
Goods in process	2,684	188
Finished goods	3,320	1,903
Inventories	$ 6,244	$ 2,158

4. Investments and Fair Value of Financial Instruments

Available-for-Sale Investments

The Company classifies short-term investments as "available-for-sale." These short-term investments are free of trading restrictions. The investments are carried at fair value, based on quoted market prices or other readily available market information. Unrealized gains and losses, net of taxes, are included in accumulated other comprehensive income, which is reflected as a separate component of stockholder's equity in the condensed consolidated balance sheets. Gains and losses are recognized when realized in the condensed consolidated statements of operations and comprehensive income (loss).

The following tables summarize the amortized cost and fair value of the available-for-sale investment securities portfolio at March 31, 2020 and December 31, 2019, and the corresponding amounts of unrealized gains and losses recognized in accumulated other comprehensive income:

(Dollars in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
March 31, 2020				
Cash equivalents:				
Money market funds	$ 11,033	$ —	$ —	$ 11,033
Short-term investments:				
Commercial paper	3,045	—	—	3,045
Total investments	$ 14,078	$ —	$ —	$ 14,078

(Dollars in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
December 31, 2019				
Cash equivalents:				
Money market funds	$ 6,864	$ —	$ —	$ 6,864
Commercial paper	900	—	—	900
Short-term investments:				
Corporate securities	3,300	—	—	3,300
Treasury bills	1,495	1	—	1,496
Commercial paper	12,119	—	—	12,119
Total investments	$ 24,678	$ 1	$ —	$ 24,679

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, 2020.

As of March 31, 2020, the Company did not have any fixed income securities that were in unrealized loss positions, and therefore has determined that no other-than-temporary impairments associated with credit losses were required to be recognized during the three ended March 31, 2020.

Fair Value Measurement

Fair value accounting is applied for all assets and liabilities that are recognized or disclosed at fair value in the condensed consolidated financial statements on a recurring basis. Assets and liabilities recorded at fair value in the condensed consolidated financial statements are categorized based upon the level of judgment associated with the inputs used to measure their fair value. Hierarchical levels, which are directly related to the amount of subjectivity associated with the inputs to the valuation of these assets or liabilities, are as follows:

- Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the Company can access at the measurement date.
- Level 2 inputs are observable inputs other than quoted prices in active markets for identical assets and liabilities, quoted prices for identical or similar assets or liabilities in inactive markets, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.
- Level 3 inputs are unobservable inputs for the asset or liability.

The fair value of the Company’s financial assets as of March 31, 2020 and December 31, 2019 were as follows:

	Fair Value Measurements at March 31, 2020			
(Dollars in thousands)	Level 1	Level 2	Level 3	Total
Assets at Fair Value				
Cash equivalents:				
Money market funds	$ 11,033	$ —	$ —	$ 11,033
Short-term investments:				
Commercial paper	—	3,045	—	3,045
Total Assets at Fair Value	$ 11,033	$ 3,045	$ —	$ 14,078

	Fair Value Measurements at December 31, 2019			
(Dollars in thousands)	Level 1	Level 2	Level 3	Total
Assets at Fair Value				
Cash equivalents:				
Money market funds	$ 6,864	$ —	$ —	$ 6,864
Commercial paper	—	900	—	900
Short-term investments:				
Corporate securities	—	3,300	—	3,300
Treasury bills	1,496	—	—	1,496
Commercial paper	—	12,119	—	12,119
Total Assets at Fair Value	$ 8,360	$ 16,319	$ —	$ 24,679

The Company’s financial instruments consist primarily of cash and cash equivalents, accounts receivable, short-term investments, accounts payable, accrued liabilities and notes payable. For accounts receivable, accounts payable, accrued liabilities, and notes payable the carrying amounts of these financial instruments as of March 31, 2020 and December 31, 2019 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.

There were no changes in valuation techniques during 2020 or 2019. The valuation methodologies used for the Company’s instruments measured at fair value and their classification in the valuation hierarchy are summarized below:

- *Money market funds and treasury bills* – Investments in money market funds and treasury bills are valued using the market approach and are classified within Level 1.

- *Commercial paper and corporate securities* – Investments in commercial paper and corporate securities are valued using the market approach and are classified within Level 2.

- *Contingent liability* – A contingent liability resulting from the Anawah acquisition, as described in Note 12, is classified within Level 3. The contingent liability was measured and recorded on a recurring basis as of March 31, 2020 and December 31, 2019 using unobservable quantitative inputs that would impact the Company’s ability and intent to pursue certain specific products developed using technology acquired in the purchase. At March 31, 2020 and December 31, 2019, this liability was included on the condensed consolidated balance sheets as a noncurrent liability.

- *Purchase Agreement common stock warrant liability* – The Company has outstanding warrants to purchase common stock that it issued to certain accredited investors and its placement agent on March 22, 2018 (as described in Note 8). The common stock warrants were classified as a liability within Level 3 based on the instrument’s adjustment features and a contingent cash payment feature. At March 31, 2020 and December 31, 2019, this liability was included on the condensed consolidated balance sheets as a noncurrent liability.

- *June 2018, June 2019, and September 2019 Offering common stock warrant liabilities* – The Company has outstanding warrants to purchase common stock that it issued to certain accredited investors on June 14, 2018 (as described in Note 8). The common stock warrants are classified as a liability within Level 3 due to a contingent cash payment feature. At March 31, 2020 and December 31, 2019, these liabilities were included on the condensed consolidated balance sheets as noncurrent liabilities.

The estimated fair value of the common stock warrant liabilities related to the March 2018 Purchase Agreement, the June 2018 Offering, the June 2019 Offering and the September 2019 Offering (the “warrant liabilities”) were remeasured at March 31, 2020 and December 31, 2019 utilizing the Black-Scholes Model, with the changes recorded on the Company’s condensed consolidated statements of operations and comprehensive income (loss). The Black-Scholes Model utilizes the following inputs to estimate fair value of an instrument: stock price, expected term, expected volatility, risk-free interest rate, and expected dividend yield. Volatility is considered by the Company to be a significant unobservable input and is calculated using a weighted average of historical stock prices of a combination of the Company and peer companies, due to the lack of sufficient historical data of the Company’s own stock price. A change in the mix or weighting of the peer companies could have resulted in a significantly lower (higher) fair value measurement as of March 31, 2020. Volatility rates used in the measurement of the warrant liabilities ranged from 122.5% to 130.0%, and the weighted average was 126.9%.

The following table summarizes the changes in the fair value of the Company’s Level 3 liabilities (in thousands):

	(Level 3)					
(Dollars in thousands)	Common Stock Warrant Liability - March 2018 Purchase Agreement	Common Stock Warrant Liability - June 2018 Offering	Common Stock Warrant Liability - June 2019 Offering	Common Stock Warrant Liability - September 2019 Offering	Contingent Liability	Total
Balance as of December 31, 2019	$ 4,579	$ 5,444	$ 1,993	$ 2,920	$ 2,000	$ 16,936
Change in fair value	(2,604)	(2,979)	(1,032)	(1,546)	—	(8,161)
Balance as of March 31, 2020	$ 1,975	$ 2,465	$ 961	$ 1,374	$ 2,000	$ 8,775

5. Variable Interest Entity

In February 2012, the Company formed Verdeca LLC (“Verdeca”), which is equally owned with Bioceres, Inc. (“Bioceres”), a U.S. wholly owned subsidiary of Bioceres, S.A., an Argentine corporation. Bioceres, S.A. is an agricultural investment and development cooperative owned by approximately 300 shareholders, including some of South America’s largest soybean growers. Verdeca was formed to develop and deregulate soybean varieties using both partners’ agricultural technologies.

The Company determined that a de facto agency relationship between the Company and Bioceres exists. The Company considers qualitative factors in assessing the primary beneficiary which include understanding the purpose and design of the VIE, associated risks that the VIE creates, activities that could be directed by the Company, and the expected relative impact of those activities on the economic performance of the VIE. Based on an evaluation of these factors, the Company concluded that it is the primary beneficiary of Verdeca.

Both the Company and Bioceres incur expenses in support of specific activities, as agreed upon by joint work plans, which apply fair market value to each partner’s activities. Unequal contributions of services are equalized by the partners through cash payments. Verdeca is not the primary obligor for these activities performed by the Company or Bioceres. Under the terms of the joint development agreement, the Company has incurred direct expenses and allocated overhead in the amounts of $318,000 and $243,000, for the three months ended March 31, 2020 and 2019, respectively.

6. Consolidated Joint Venture

On August 9, 2019, the Company and Legacy Ventures Hawaii, LLC, a Nevada limited liability company (“Legacy”), formed Archipelago Ventures Hawaii, LLC, a Delaware limited liability company (“Archipelago”) 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, 2020, the Company and Legacy hold 50.75% and 49.25% percentage interests in Archipelago, respectively, and have made capital contributions to Archipelago of $1,420,000 and $1,378,000, 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 $102,000 is recorded as an adjustment to net income to arrive at net income attributable to common stockholders on the condensed consolidated statements of income (loss) for the three months ended March 31, 2020. Legacy’s equity interests are presented as noncontrolling interests on our condensed consolidated balance sheets. Refer to Note 1 for basis of presentation.

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 the Company and Corteva are active participants in the activities of the collaboration. The Company and Corteva participate in the research and development, and the Company 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*, and expenses internal R&D costs 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, 2020, the Company leases office space in Davis, CA, Phoenix, AZ, and Molokai, HI, 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; we recognize lease expense for these short-term leases on a straight-line basis. The Company subleases a portion of the Davis office lease and greenhouse to third parties. During the three months ended March 31, 2020, the Company entered into a lease amendment that provides for additional office space in Davis, CA, and extends the term through April 2025, with one option to renew for an additional five-year term. The Company expects to exercise its options to renew, and in accordance with ASC 842, accounted for the amendment and expected renewal as a lease modification and remeasured the operating lease liability, resulting in an additional $3.8 million operating lease liability and right of use asset. There are no finance leases or material leases that have not yet commenced as of March 31, 2020.

Some leases (the Davis office, warehouse, greenhouse 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	Balance Sheet Line Item	March 31, 2020	December 31, 2019
Assets			
Operating lease assets	Right of use asset	$ 5,654	$ 1,963
Total leased assets		$ 5,654	$ 1,963
Liabilities			
Current - Operating	Operating lease liability-current	$ 526	$ 611
Noncurrent - Operating	Operating lease liability-noncurrent	5,312	1,497
Total leased liabilities		$ 5,838	$ 2,108

Lease Cost	Classification	For the Three Months Ended March 31, 2020	For the Three Months Ended March 31, 2019
Operating lease cost	SG&A and R&D Expenses	$ 223	$ 175
Short term lease cost (1)	R&D Expenses	80	48
Sublease income (2)	SG&A and R&D Expenses	(11)	(15)
Net lease cost		$ 292	$ 208

(1) Short term lease cost consists primarily of field trial lease agreements with a lease term of 12 months or less.
(2) Sublease income is recorded as a credit to lease expense.

Lease Term and Discount Rate	March 31, 2020	December 31, 2019
Weighted-average remaining lease term (years)	5.9	2.6
Weighted-average discount rate	6.5%	7.0%

9. Private Placement and Registered Direct Offering

Private Placement (2018)

On March 22, 2018, the Company issued 300,752 shares of its common stock ("common stock") and warrants to purchase up to 300,752 shares of common stock with an initial exercise price equal to $45.75 (the "March 2018 Warrants"), in a private placement (the "March 2018 Private Placement") in accordance with a securities purchase agreement (the "March 2018 Purchase Agreement") entered into with certain institutional and accredited investors (collectively, the "Purchasers") on March 19, 2018. The number of shares of common stock, the number and exercise price of the March 2018 Warrants issued to the Purchasers were subject to adjustments as provided in the March 2018 Purchase Agreement. The March 2018 Warrants are immediately exercisable, subject to certain ownership limitations, and expire five years after the date of issuance.

Following the adjustments as provided in the March 2018 Purchase Agreement, the number of shares issued to the Purchasers was 1,201,634, the total number of shares issuable upon exercise of the March 2018 Warrants was 1,282,832 and the per share exercise price of the March 2018 Warrants was $10.7258. These condensed consolidated financial statements reflect these additional issuances.

The adjustment feature for the common stock and the March 2018 Warrants were determined to be liabilities based on each instrument's adjustment features and the contingent cash payment feature of the common stock warrants.

The March 2018 Warrant liability was marked-to-market and valued at $2.6 million at March 31, 2020, resulting in income of $2.0 million recognized during the three months ended March 31, 2020. The March 2018 Warrant liability was marked-to-market and valued at $6.3 million at March 31, 2019, resulting in expense of $4.0 million recognized during the three months ended March 31, 2019.

Registered Direct Offering (2018)

On June 11, 2018, the Company entered into agreements with several institutional and accredited investors (the "June 2018 Purchase Agreement") for the purchase of 1,392,345 shares of its common stock at a purchase price of $9.93 per share.

Additionally, in a concurrent private placement, the Company issued to the investors unregistered warrants to purchase up to 1,392,345 shares of common stock at a purchase price per warrant of $0.125 (the "June 2018 Warrants"). The June 2018 Warrants have an exercise price of $9.94 per share. Subject to certain ownership limitations, the June 2018 Warrants are exercisable upon issuance and expire five and one-half years after the date of issuance.

The June 2018 Warrants were determined to be a liability as they have a contingent cash payment feature. The June 2018 Warrants were marked-to-market and valued at $2.5 million at March 31, 2020, resulting in income of $3.0 million recognized during the three months ended March 31, 2020. The June 2018 Warrants were marked-to-market and valued at $7.3 million at March 31, 2019, resulting in expense of $4.5 million recognized during the three months ended March 31, 2019.

Registered Direct Offering (June 2019)

On June 12, 2019, the Company entered into a securities purchase agreement with certain institutional and accredited investors (the "June 2019 Purchase Agreement") relating to the offering and sale of 1,489,575 shares of its common stock at a purchase price of $4.91.

Additionally, in a concurrent private placement, the Company issued to the investors unregistered warrants to purchase up to 1,489,575 shares of common stock at a purchase price per warrant of $0.125 (the "June 2019 Warrants"). The June 2019 Warrants have an exercise price of $5.00 per share. Subject to certain ownership limitations, the June 2019 Warrants are exercisable upon issuance and expire five and one-half years after the date of issuance.

The June 2019 Warrants were determined to be a liability as they have a contingent cash payment feature. In August and September 2019, investors exercised 1,053,745 warrants. The remaining 435,830 June 2019 Warrants outstanding were marked to market and valued at $1.0 million at March 31, 2020, resulting in income of $1.0 million recognized during the three months ended March 31, 2020.

Registered Direct Offering (September 2019)

On September 5, 2019, the Company entered into a securities purchase agreement with certain institutional and accredited investors (the "September 2019 Purchase Agreement") relating to the offering and sale of 1,318,828 shares of its common stock at a purchase price of $7.52.

Additionally, in a concurrent private placement, the Company issued to the investors unregistered warrants to purchase up to 659,414 shares of common stock at a purchase price per warrant of $0.125 (the "September 2019 Warrants"). The September 2019 Warrants have an exercise price of $7.52 per share. Subject to certain ownership limitations, the September 2019 Warrants are exercisable upon issuance and expire five and one-half years after the date of issuance.

The September 2019 Warrants were determined to be a liability as they have a contingent cash payment feature. The September 2019 Warrants were marked-to-market and valued at $1.4 million at March 31, 2020, resulting in income of $1.5 million recognized during the three months ended March 31, 2020.

10. Stock-Based Compensation and Warrants

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 the 2006 Plan was terminated for future awards. The 2006 Plan continues to govern the terms of options that remain outstanding and were issued under the 2006 Plan. The 2015 Plan became effective 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 154,387 shares of common stock reserved for future issuance, which included 10,637 shares under the 2006 Plan 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 ISOs and NSOs will be granted at a price per share not less than the fair value at the date of grant. Options granted generally vest over a four-year period; however, the options granted in the third quarter of 2018 vest over a two-year period, vesting monthly on a pro-rated basis. Options granted, once vested, are generally exercisable for up to 10 years after grant.

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 120,000 shares. As of March 31, 2020, a total of 1,043,486 shares of common stock were reserved for issuance under the 2015 Plan, of which 193,162 shares of common stock are available for future grant. As of March 31, 2020, a total of 22,929 and 850,324 options are outstanding under the 2006 and 2015 Plans, respectively.

A summary of activity under the stock incentive plans is as follows (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, 2019	661,701	$ 21.60	$ 305
Options granted	290,000	4.91	
Options exercised	—	—	
Options forfeited	(55,441)	5.25	
Options expired	(23,007)	45.62	
Outstanding — Balance at March 31, 2020	873,253	$ 16.46	$ —
Vested and expected to vest — March 31, 2020	861,245	$ 16.60	$ —
Exercisable —March 31, 2020	414,031	$ 27.22	$ —

As of March 31, 2020, there was $1.9 million of unrecognized compensation cost related to unvested stock-based compensation grants that will be recognized over the weighted-average remaining recognition period of 2.7 years.

The fair value of stock option awards to employees, executives, directors, and other service providers was estimated at the date of grant using the Black-Scholes Model with the following weighted-average assumption. There were 290,000 and 7,500 options granted during the three months ended March 31, 2020 and 2019, respectively.

	Three Months Ended March 31,	
	2020	2019
Expected term (years)	6.03	2.58
Expected volatility	122.5%	133%
Risk-free interest rate	1.40%	2.55%
Dividend yield	—	—

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. 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 trading day of the offering period. As of March 31, 2020, the number of shares of common stock reserved for future issuance under the ESPP is 116,757. The ESPP provides for automatic annual increases in the shares available for purchase on January 1 of each year. As of March 31, 2020, 21,875 shares had been issued under the ESPP. The Company recorded $12,700 and $4,300, of stock compensation expense for the three months ended March 31, 2020 and 2019, respectively.

Warrants

As of March 31, 2020, the Company has 4,349,001 common stock warrants outstanding with a weighted average exercise price of $8.99. The expiration of the warrants ranges from July 2021 to March 2025.

In connection with the Series D preferred stock financing in the first half of 2014, the Company issued warrants, exercisable as of the issuance date, to the Series D preferred stock investors to purchase an aggregate of 61,397 shares of common stock at an exercise price of $363.20 per share and to the placement agents to purchase 1,674 shares of common stock at $268.80. Of the 63,071 warrants issued, 1,759 expired on March 28, 2019 and the remaining 61,312 expired in the second quarter of 2019, along with those issued to the placement agents.

As of March 31, 2020, 1,297,870 common stock warrants are outstanding that were issued in the March 2018 Private Placement. Of the total, 1,282,832 shares have a purchase price of $10.7258 and the remaining 15,038 common stock warrants have an exercise price of $41.5625. See Note 9.

As of March 31, 2020, 1,461,962 common stock warrants are outstanding in accordance with the June 2018 Offering. Of the total, 1,392,345 shares have a purchase price of $9.94 and the remaining 69,617 common stock warrants have an exercise price of $12.568. See Note 9.

In connection with a professional services agreement with a non-affiliated third party, executed in April 2019, the Company issued 45,154 warrants ("Service Warrants") at an exercise price of $6.18. The Service Warrants vest ratably over 12 months and expire in five years from the date of issuance. The Service Warrants are cancelable immediately prior to a change of control subsequent to the termination/expiration of the advisory agreement. The Company also issued 100,000 performance-based warrants ("Performance Warrants") at an exercise price of $6.18 and vest in 1/6 increments upon the achievement of a qualifying milestone as defined within the agreement. The Performance Warrants expire in five years from the date of issuance and are cancelable immediately prior to a change of control subsequent to the sixth month anniversary of the termination/expiration of the advisory agreement.

The Service and Performance Warrants were determined to be equity instruments. Stock compensation expense associated with the Service Warrants is recognized ratably over the service period (i.e. one-year term). A performance acceleration event was deemed to have been achieved in August 2019, triggering the full vesting of the Performance Warrants. The Company recognized a portion of the Performance Warrants' stock compensation expense during the third quarter of 2019 as a cumulative adjustment for the period during which services have already been provided. The remaining Performance Warrants expense is being recognized ratably over the remaining service period. For the Service Warrants, $124,000 of stock compensation expense was recognized during the three months ended March 31, 2020.

In June 2019, concurrent with the June 2019 Offering and pursuant to the June 2019 Purchase Agreement, the Company commenced a private placement whereby it issued and sold warrants ("June 2019 Warrants") exercisable for an aggregate of 1,489,575 shares of common stock, which equals 100% of the shares of common stock sold in the June 2019 Offering, with a purchase price of $0.125 per underlying warrant share and with an exercise price of $5.00 per share. The June 2019 Warrants are exercisable upon issuance and will expire five and a half years from the date of issuance. In August and September 2019, investors exercised a portion of the June 2019 Warrants and purchased 1,053,745 shares of common stock. The Company also issued warrants to the placement agents to purchase a total of 74,479 shares of common stock with an exercise price equal to $6.2938. The placement agent warrants are exercisable upon issuance and will expire five years from the date of issuance. As of March 31, 2020, the investors and placement agent hold outstanding warrants to purchase 510,309 shares of common stock warrants issued pursuant to the June 2019 Offering. See Note 9.

In July 2019, the Company issued warrants to purchase 10,000 shares of common stock to an independent contractor at an exercise price of $2.19 and in August 2019, the Company issued warrants to purchase 20,000 shares of common stock to two affiliated third-parties at an exercise price of $1.92. These warrants were determined to be equity instruments and were measured on the grant date using the Black Scholes Model. The warrants issued in July vest ratably over 12 months and expire two years from the date of issuance. As such, stock compensation expense associated with these warrants is recognized ratably over the 12-month service period. The August warrants vested on the issuance date of August 5, 2019 and expire two years from the date of issuance. As such, stock compensation expense associated with the warrants was recognized as vested on the issuance date. Stock compensation expense of $4,000 was recognized during the three months ended March 31, 2020 for the warrants issued in July 2019.

In September 2019, concurrent with the September 2019 Offering and pursuant to the September 2019 Purchase Agreement, the Company commenced a private placement whereby it issued and sold warrants ("September 2019 Warrants") exercisable for an aggregate of 659,414 shares of common stock, which equals 50% of the shares of common stock sold in the September 2019 Offering, with a purchase price of $0.125 per underlying warrant share and with an exercise price of $7.52 per share. The September 2019 Warrants are exercisable upon issuance and will expire five and a half years from the date of issuance. The Company also issued warrants to the placement agents to purchase a total of 65,942 shares of common stock with an exercise price equal to $9.4781. The placement agent warrants are exercisable upon issuance and will expire five years from the date of issuance. As of March 31, 2020, all 725,356 common stock warrants are outstanding that were issued with the September 2019 Offering. See Note 9.

In February 2020, the Company issued warrants to purchase 10,000 shares of common stock to an independent contractor at an exercise price of $4.91. These warrants were determined to be equity instruments and were measured on the grant date using the Black Scholes Model. The warrants vest ratably over 12 months and expire two years from the date of issuance. As such, stock compensation expense associated with these warrants is recognized ratably over the 12-month service period. Stock compensation expense of $9,400 associated with these warrants was recognized during the three months ended March 31, 2020.

In connection with an extension of the professional services agreement with a non-affiliated third party, executed in April 2019, the Company issued an additional 150,000 warrants to purchase shares of common stock in February 2020 at an exercise price of $4.71. These warrants were determined to be equity instruments and were measured on the grant date using the Black Scholes Model. The warrants vest ratably over 12 months and expire two years from the date of issuance. As such, stock compensation expense associated with these warrants is recognized ratably over the 12-month service period. Stock compensation expense of $135,400 associated with these warrants was recognized during the three months ended March 31, 2020.

In connection with a professional services agreement with a non-affiliated third party, executed in March 2020, the Company issued warrants to purchase 18,350 shares of common stock at an exercise price of $2.50. The warrants vested on the issuance date and expire in three years from the date of issuance. The warrants are cancelable immediately prior to a change of control subsequent to the termination/expiration of the advisory agreement. These warrants were determined to be equity instruments and were measured on the grant date using the Black Scholes Model. As such, stock compensation expense associated with these warrants was recognized as vested on the issuance date. Stock compensation expense of $36,700 associated with these warrants was recognized during the three months ended March 31, 2020.

11. 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 -0.1% for the three months ended March 31, 2020 and 2019. 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 and foreign withholding taxes.

The Company experienced an ownership change under IRC Section 382 as a result of the common shares issued in connection with the June 2018 Offering. This ownership change limited the Company's ability to utilize its net operating loss carryforwards prior to expiration and certain net operating loss carryforwards were written off as a result. The Company is currently conducting additional analysis regarding the valuation of the Company at the time of the ownership change to assess what, if any, portion of the limitation may be reversed. Any adjustment to the amount of limitation will not impact the deferred tax asset balance due to the full valuation allowance.

During the three months ended March 31, 2020, there were no material changes to the Company's uncertain tax positions.

12. Commitments and Contingencies

Leases

The Company leases office and laboratory space, greenhouse 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.

Contingent Liability Related to the Anawah Acquisition

On June 15, 2005, the Company completed its agreement and plan of merger and reorganization with Anawah, Inc. ("Anawah"), to purchase the 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 products developed using technology acquired in the purchase. As of December 31, 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 the third quarter of 2016, one of the programs previously accrued for was abandoned and another program previously abandoned was reactivated. During the fourth quarter of 2019, the Company determined that one of the technologies was no longer active and decided to abandon the previously accrued program. As a result, the Company recognized a gain of $1.0 million in the consolidated statements of operations and comprehensive income (loss). As of March 31, 2020, the Company continues to pursue 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 sheets as an other noncurrent liability.

Notes Payable

In the third quarter of 2019, the Company entered into notes payable agreements to finance the purchase of company vehicles. These notes have an interest rate of 8%, term of five years, and mature in 2024. In the first quarter of 2020, the Company entered into a note payable to finance the purchase of a company vehicle. The note has an interest rate of 7.64%, term of five years, and matures in 2024. The remaining notes payable balance presented on the balance sheet as of March 31, 2020 was $161,000.

Contracts

The Company has entered into a non-cancelable service agreement with an unrelated party that requires the Company to pay certain funding commitments. The following table sets forth our minimum funding requirements under this agreement as of March 31, 2020 (in thousands):

Years ending December 31,	**Amounts**
Remainder of 2020	$ 500
2021	750
2022	–
2023	–
2024	–
Thereafter	–
Total	$ 1,250

13. Net Income (Loss) per Share

Basic net income (loss) per share is calculated by dividing net income (loss) 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 income (loss) per share is computed giving effect to all potentially dilutive common shares, including common stock issuable upon exercise of stock options and warrants. As of March 31, 2020, securities that were not included in the diluted per share calculations because they would be anti-dilutive included 871,908 options to purchase common stock and 4,326,949 warrants to purchase common stock. As of March 31, 2019, securities that were not included in the diluted per share calculations because they would be anti-dilutive included 535,243 options to purchase common stock and 2,821,144 warrants to purchase common stock.

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

	For the Three Months Ended March 31, 2020	2019
Net income (loss) per share - Basic		
Numerator:		
Net income (loss) per share attributable to common stockholders	$ 2,525	$ (12,612)
Denominator:		
Weighted average number of common shares outstanding	8,651,213	4,776,540
Basic net income (loss) per share attributable to common stockholders:	$ 0.29	$ (2.64)
Net income (loss) per share - Diluted		
Numerator:		
Net income (loss) per share attributable to common stockholders	$ 2,525	$ (12,612)
Denominator:		
Weighted average number of common shares outstanding	8,651,213	4,776,540
Effect of dilutive stock options	1,345	—
Effect of dilutive warrants	22,052	—
Weighted average number of common shares outstanding - diluted	8,674,610	4,776,540
Diluted net income (loss) per share attributable to common stockholders:	$ 0.29	$ (2.64)

14. 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 JSF. JSF is deemed a related party of the Company because MCC, the Company's largest stockholder, and 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 $16,000 and $40,000 as of March 31, 2020 and December 31, 2019, respectively, and are included in the condensed consolidated balance sheets as amounts due to related parties.

We currently lease land on the island of Molokai, Hawaii from an entity owned by Kevin Comcowich, the Chair of our Board of Directors, and his wife. We grow hemp on this land to support the operations of our joint venture Archipelago Ventures Hawaii. The original lease was executed in February 2019, covers 10 acres of land, has a term of two years and provides for rent payments of $1,200 per acre per year. We engaged a third-party contractor to construct a fence on the property to adhere to the rules of the hemp pilot program. Our out of pocket costs to build this fence were approximately $126,400. Mr. Comcowich supplied materials to the contractor and received payments from the contractor totaling approximately $44,000. In March 2020, we entered into a lease amendment for two additional 10-acre parcels, at the same lease rate of $1,200 per acre per year, and with a term of two years. A third amendment to include two additional 10-acre parcels, at the same lease rate of $1,200 per acre per year, and with a term of two years is currently under draft.

15. Subsequent Events

In April 2020, the Company borrowed $1.1 and entered into a promissory note for the same amount (the "Note") under the Paycheck Protection Program ("PPP") that was established under the Coronavirus Aid Relief, and Economic Security Act ("CARES Act") of 2020. The Note provides for an interest rate of 1.00% per year, matures two years after the issuance date and is forgivable if certain employee and compensation levels are maintained and the proceeds are used for qualifying purposes. Beginning on the seventh month following the date of the Note, the Company is required to make 18 equal monthly installment payments of principal and interest until maturity with respect to any portion of the loan that is not forgiven.

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 leader in science-based approaches to developing high value crop productivity traits primarily in hemp, wheat, and soybean, designed to enhance farm economics by improving the performance of crops in the field, as well as their value as food ingredients, health and wellness products, and their viability for industrial applications. We use state of the art gene-editing technology and advanced breeding techniques to develop these proprietary innovations which we are beginning to monetize through a number of methods including seed and grain sales, product extract sales, trait licensing and royalty agreements.

Our commercial strategy is to link consumer's nutrition, health and wellness 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. In particular, we believe the recent legalization of hemp in the U.S. and many other areas of the world has created a significant agricultural and financial opportunity. The demonstrated broad demand for industrial, nutritional, health and wellness products from hemp, coupled with its poor genetics represent a vast, new opportunity for Arcadia to add substantial value to its existing high value trait and seed estate. We are applying our proprietary, rapid prototyping technology platform, ArcaTech, to deliver innovations addressing the many challenges farmers face in growing what is essentially an undomesticated crop. As such, our forward discovery research is focused on non-GM hemp innovations.

The passage of the U.S. Agriculture Improvement Act of 2018 – also known as the Farm Bill – confirmed the federal legalization of hemp, the term given to non-psychoactive cannabis containing less than 0.3% tetrahydrocannabinol (THC). It also included provisions for legalizing on a federal level hemp's cultivation, transport and sale for the first time in more than 75 years. Hemp, not previously distinguished by the federal government from cannabis, a Schedule 1 drug and banned as an agricultural crop, lacks substantive plant biology research and suffers from suboptimal genetics, highly fragmented germplasm and rampant inconsistencies. We are targeting hemp-based solutions that allow farmers to reliably and consistently achieve compliance with USDA regulations, through varieties with improved functionality and application of specific attributes such as select cannabinoid contents for health and wellness, enhanced proteins profiles for plant-based dietary applications and industrial applications such as clothing and hempcrete. Arcadia conducts its business in only federal and state markets in which its activities are legal.

On October 31, 2019, the USDA published the interim final rule as authorized by the Agriculture Improvement Act of 2018 for hemp cultivation, which mandates that states test hemp crops and dispose of "hot" crops that exceed 0.3% THC. While hemp farmers will have access to crop protection options, the destruction of hot crops that fail these stringent inspections will not be a covered loss under crop insurance programs. In 2019 alone, more than 20% of U.S. hemp crops were non-compliant, representing over $2 billion in losses for growers.

Arcadia GoodHemp

In December 2019, we announced the launch of a new product line, GoodHemp, as the company's new commercial brand for delivering genetically superior hemp seeds, transplants, flower and extracts. The first variety in GoodHemp's catalog, Complia Bot+, is a widely adapted cannabis strain that delivers high cannabinoid (CBD) content (more than 10%) with ultra-low THC, the psychoactive compound in cannabis. It is part of the Complia hemp product line Arcadia is bringing to market through GoodHemp, with six additional proprietary varieties in early adopter farmer trials with sales expected in the 2020 season.

The Hemp Business Journal estimates the hemp CBD market – the primary non-psychoactive compound in hemp – totaled $190 million in U.S. sales in 2018. By 2022, the Brightfield Group, a hemp and CBD market research firm, projects U.S. sales to reach $22 billion. Additionally, Grandview research estimates the market for non-cannabinoid, industrial hemp market will exceed $15 billion by 2027.

Archipelago Ventures Hawaii, LLC

In August 2019, we formed a new joint venture to serve the Hawaiian, North American and Asian hemp markets, Archipelago Ventures Hawaii, LLC (“Archipelago”). This new venture between Arcadia and Legacy Ventures Hawaii (“Legacy”) combines Arcadia’s extensive genetic expertise and seed innovation history with Legacy’s growth capital and strategic advisory expertise in the Hawaiian markets. Additionally, Legacy brings to the partnership years of proven success in extraction, product formulation and sales of cannabinol oil and distillate products through its equity partner, Vapen CBD. Legacy was originally formed to be a vehicle for its partners to pursue hemp opportunities within the Hawaiian Islands. Legacy’s primary role within Archipelago is to build world class cGMP extraction facilities to allow Hawaiian farmers an outlet for maximizing their profits growing and converting hemp to high grade CBD, as well as other high-value compounds. Legacy’s equity partner, Vapen CBD, is a wholly owned subsidiary of VEXT which is a publicly traded cannabis operator based in Phoenix, Arizona listed on both the Canadian and Frankfurt exchanges.

Archipelago creates a vertically integrated supply chain, from seed to sale, we believe the first of its kind in Hawaii, and has three important strategic imperatives: (1) ensure a reliable supply chain during critical scale up of the global hemp market, a major risk mitigation for success, (2) ensure high quality throughout the supply chain, from genetics to the field and field to the customer and (3) ensure being well-positioned to address the unique needs and opportunities of the Hawaiian market.

Arcadia GoodWheat

In 2018, we launched our GoodWheat brand, a non-genetically modified (non-GM) portfolio of wheat products that enables food manufacturers to differentiate their consumer-facing brands. Consumer food companies are looking to simplify their food ingredient formulations and consumers are demanding “clean labeling” in their foods, paying more for foods having fewer artificial ingredients and more natural, recognizable and healthy ingredients. A 2017 survey by PR agency Ingredient Communications found that 73% of consumers are happy to pay a higher retail price for a food or drink product made with ingredients they recognize. Because GoodWheat increases the nutrient density directly in the primary grains and oils, it provides the mechanism for food formulation simplification naturally, cost effectively and in a time-frame to meet evolving consumer demands.

The brand launch is a key element of the company’s go-to-market strategy to achieve greater value for its innovations by participating in downstream consumer revenue opportunities. We designed the brand to make an immediate connection with consumers that products made with GoodWheat meet their demands for healthier wheat options that also taste great. The GoodWheat brand encompasses our current and future non-GM wheat portfolio of high fiber Resistant Starch (RS) and Reduced Gluten wheat varieties, as well as future wheat innovations. In October 2019, the U.S. Patent and Trademark Office granted us the latest patents for extended shelf life wheat, the newest trait in our non-genetically modified wheat portfolio. This new trait was designed to promote whole wheat consumption by improving the shelf life and taste of whole grain wheat products.

With additional patents granted in 2019, we now hold more than 15 global patents on our high fiber Resistant Starch wheat, protecting both bread wheat and durum (pasta) wheat. Claims granted in 2019 strengthen our intellectual property for our Resistant Starch portfolio of products.

We announced in August 2019 an agreement with Bay State Milling Company and Arista Cereal Technologies to bring to market our resistant starch GoodWheat in North America and other key markets, beginning in late 2019. In the daily American diet approximately 500 calories come from wheat products, 25% of the FDA’s recommended daily caloric intake for a woman and 20% for a man. The GoodWheat portfolio of specialty wheat varieties delivers new functional value through an ingredient already an important component of the human diet.

In years to come, we expect to achieve enhanced nutritional characteristics within a number of other broad acre crops using advanced breeding and gene-editing techniques. Targets include but are not limited to higher fiber, longer shelf life and enhanced protein in crops other than wheat.

Verdeca HB4® Soybean

In 2012, we partnered with Bioceres, Inc. (“Bioceres”) an Argentina-based technology company, to form Verdeca LLC (“Verdeca”), a U.S.-based joint venture company to deploy next-generation soybean traits developed to benefit soybean producers through quality improvement, stress mitigation and management practices. The HB4® soybean varieties deliver two layers of value for growers: drought and herbicide tolerance, offering resistance to a broad-spectrum herbicide utilized to prevent growth of a wide range of annual and perennial broadleaf weeds and grasses.

HB4® was discovered by researchers of the CONICET, the National Scientific and Research Council in Argentina, through the identification of one gene that gives sunflower the capacity to tolerate hydric and saline stress. This gene was transferred from sunflower to soybean.

Verdeca’s HB4® soybeans have undergone extensive testing, including multi-location field trials in Argentina and the United States and multiple regulatory field trials. The results of these trials demonstrate that the HB4® trait can provide yield advantages under stress conditions – including drought and low-water conditions – found in several soybean production areas. Verdeca introduced a trait stack combining HB4® with an herbicide tolerance trait to deliver two layers of value for growers.

HB4® is the first trait offering tolerance to drought and salinity in soybeans, with 30 international patents. HB4® is currently approved in the four main countries producing this strategic crop – the U.S., Brazil, Argentina and Paraguay - representing 80% of the global soybean market. Regulatory submissions are under consideration by China, Canada, Bolivia and Uruguay. Import approval by China is required for commercial launch and the expectation to obtain such approval in late 2020 is under review in light of the recent coronavirus.

Soybeans are the world’s fourth largest crop, grown on more than 120 million hectares annually. Global population growth, combined with a growing middle class in countries like China and India, have resulted in increased demand for this important protein source. More than 50 million of the world’s soybean hectares are grown in Argentina and Brazil, a region that has experienced significant drought conditions in recent years.

Since our inception, we have devoted substantially all our efforts to research and development activities, including the discovery, development, and testing of our traits and products in development incorporating our traits. To date, we have not generated revenues from sales of commercial products, other than limited revenues from our GoodWheat and SONOVA products. We do receive revenues from fees associated with the licensing of our traits to commercial partners. Our long-term business plan and growth strategy is based in part on our expectation that revenues from products that incorporate our traits will comprise a significant portion of our future revenues.

We have never been profitable and had an accumulated deficit of $204.6 million as of March 31, 2020. We had net income of $2.4 million for the three months ended March 31, 2020, and net losses of $12.6 million for the three months ended March 31, 2019. We expect to incur substantial costs and expenses before we obtain any revenues from the sale of seeds incorporating our traits. As a result, our losses in future periods could become even more significant, and we will need additional funding to support our operating activities.

Impact of Novel Coronavirus

We are closely monitoring how the spread of the novel coronavirus is affecting our business operations and our employees. Our targeted revenues have been adversely impacted as hemp growers have been slower to make decisions to purchase hemp seeds due to economic uncertainty and wheat consumer packaged goods companies have been heavily focused on production over R&D evaluation as demand for staples like pasta and flour have increased. We have developed preparedness plans to help protect the safety of our employees while safely continuing business operations. Due to the spread of the outbreak in California and elsewhere where we have corporate offices, we have temporarily limited access to our offices until further notice and implemented a mandatory remote work policy for employees during this period. As an agriculture company, our business is deemed essential and therefore is not subject to the various shelter-in-place orders mandated by the federal, state, and local governments. Therefore, our laboratory and field personnel have continued to report to their physical place of work while exercising additional safety measures, including but not limited to, increased sanitation and cleaning protocols, utilizing personal protective equipment (“PPE”), rotating shifts, and maintaining safe social distancing to the highest extent possible. At this time, there is significant uncertainty relating to the trajectory of the novel coronavirus outbreak and impact of related responses. The continued spread of the outbreak may further impact our business, results of operations, and financial condition.

Components of Our Statements of Operations Data

Revenues

We derive our revenues from product revenues, royalties, and contract research agreements. Given our acute focus on selling our GoodWheat and GoodHemp products, we do not intend to continue pursuing contract research agreements and government grant projects.

Product Revenues

Our product revenues to date have consisted primarily of sales of our SONOVA products, with initial GoodWheat seed sale revenues recognized in the fourth quarter of 2019. 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 shipment. Our revenues fluctuate depending on the timing of shipments of product to our customers.

License Revenues

Our license revenues to date consist of up-front, nonrefundable license fees, annual license fees, and subsequent milestone payments that we receive under our research and license agreements. We have historically recognized nonrefundable up-front license fees and guaranteed, time-based payments as revenue proportionally over the expected development period. With the implementation of ASC Topic 606, revenue generated from up-front license fees will be recognized upon execution of the agreement. We recognize annual license fees when it is probable that a material reversal will not occur.

Milestone fees are variable consideration that is initially constrained and recognized only when it is probable that such amounts would not be reversed. The Company assesses when achievement of milestones are probable in order to determine the timing of revenue recognition for milestone fees. Milestones typically consist of significant stages of development for our traits in a potential commercial product, such as achievement of specific technological targets, completion of field trials, filing with regulatory agencies, completion of the regulatory process, and commercial launch of a product containing our traits. Given the seasonality of agriculture and time required to progress from one milestone to the next, achievement of milestones is inherently uneven, and our license revenues are likely to fluctuate significantly from period to period.

Royalty Revenues

Our royalty revenues consist of amounts earned from the sale of commercial products that incorporate our traits by third parties. Our royalty revenues consist of a minimum annual royalty, offset by amounts earned from the sale of products. We recognize the minimum annual royalty on a straight-line basis over the year, and we recognize royalty revenue resulting from the sale of products when the third parties transfer control of the product to their customers, which generally occurs upon shipment. Our royalty revenues can fluctuate depending on the timing of shipments of product by the third parties to their customers.

Contract Research and Government Grant Revenues

Contract research and government grant revenues consist of amounts earned from performing contracted research primarily related to breeding programs or the genetic engineering of plants for third parties. Contract research revenue is accounted for as a single performance obligation for which revenues are recognized over time using the input method (e.g. costs incurred to date relative to the total estimated costs at completion).

In 2019 and prior, we received payments from government entities in the form of government grants. Government grant revenue is accounted for as a single performance obligation for which revenues are recognized over time using the input method (e.g. costs incurred to date relative to the total estimated costs at completion). Our obligation with respect to these agreements is to perform the research on a best-efforts basis.

Operating Expenses

Cost of Product Revenues

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

Research and Development Expenses

Research and development expenses consist of costs incurred in the discovery, development and testing of our products and products in development incorporating our traits. These expenses consist primarily of employee salaries and benefits, fees paid to subcontracted research providers, fees associated with in-licensing technology, land leased for field trials, chemicals and supplies, and other external expenses. These costs 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.

Selling, General and Administrative Expenses

Selling, general and administrative expenses consist primarily of employee costs, professional service fees, and overhead costs. Our selling, general, and administrative expenses may fluctuate from period to period. In connection with our commercialization activities for our hemp seed and consumer ingredient products, we expect to increase our investments in sales and marketing and business development.

Interest Expense

Interest expense consists primarily of contractual interest on notes payable that were entered into in the third quarter of 2019 to finance the purchase of company vehicles.

Other Income, Net

Other income, net, consists of interest expense, interest income and the amortization of investment premium and discount on our cash and cash equivalents and investments.

Change in the Estimated Fair Value of Common Stock Warrant Liabilities

Change in the estimated fair value of common stock warrant liabilities is comprised of the fair value remeasurement of the liabilities associated with the March 2018 Private Placement and the June 2018, June 2019 and September 2019 Offerings.

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, 2020 and December 31, 2019. 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, 2020 and 2019

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019	$ Change	% Change
	(In thousands except percentage)			
Revenues:				
Product	$ 154	$ 107	$ 47	44%
License	100	—	100	100%
Royalty	30	—	30	100%
Contract research and government grants	25	51	(26)	(51)%
Total revenues	309	158	151	96%
Operating expenses:				
Cost of product revenues	132	59	73	124%
Research and development	2,244	1,505	739	49%
Selling, general and administrative	3,723	2,812	911	32%
Total operating expenses	6,099	4,376	1,723	39%
Loss from operations	(5,790)	(4,218)	(1,572)	37%
Interest expense	(3)	—	(3)	100%
Other income, net	72	120	(48)	(40)%
Change in fair value of common stock warrant liabilities	8,161	(8,495)	16,656	(196)%
Net income (loss) before income taxes	2,440	(12,593)	15,033	(119)%
Income tax provision	(17)	(19)	2	(11)%
Net income (loss)	2,423	(12,612)	15,035	(119)%
Net loss attributable to non-controlling interest	(102)	—	(102)	100%
Net income (loss) attributable to common stockholders	$ 2,525	$ (12,612)	$ 15,137	(120)%

Revenues

Product revenues accounted for 50% and 68% of our total revenues in the three months ended March 31, 2020 and 2019, respectively. The $47,000, or 44%, increase in product revenues for the three months ended March 31, 2020 compared to the same period in 2019 was primarily driven by additional volume of SONOVA encapsulated orders.

License revenues accounted for 32% and 0% of our total revenues in the in the three months ended March 31, 2020 and 2019, respectively. The $100,000, or 100%, increase in license revenues for the three months ended March 31, 2020 compared to the same period in 2019 was driven by the achievement of certain milestones during the three months ended March 31, 2020.

Royalty revenues accounted for 10% and 0% of our total revenues in the three months ended March 31, 2020 and 2019, respectively. The $30,000 of royalty revenues for the three months ended March 31, 2020 represents the proportionate share of the minimum annual royalty pursuant to the final settlement agreement entered into with Arista in December 2019. There were no such revenues for the three months ended March 31, 2019.

Contract research and government grant revenues accounted for 8% and 32% of our total revenues for the three months ended March 31, 2020 and 2019, respectively. Our contract research and government grant revenues decreased by $26,000, or 51%, in the three months ended March 31, 2020 compared to the same period in 2019. The decrease was driven by the completion of agreements and grants during 2019. Given our acute focus on selling our GoodWheat and GoodHemp products, we do not intend to continue pursuing contract research agreements and government grant projects.

Cost of Product Revenues

Cost of product revenues increased by $73,000, or 124%, in the three months ended March 31, 2020 compared to the same period in 2019. The increase is primarily due to increased product revenues and a write-down of wheat inventory during the three months ended March 31, 2020.

Research and Development

Research and development expenses increased by $739,000, or 49%, in the three months ended March 31, 2020 compared to the three months ended March 31, 2019. The increase was primarily driven by higher employee-related expenses as we expand our research teams, as well as external hemp-related costs. The increase was partially offset by the reduction in GoodWheat field research costs as our commercial efforts progress, as well as reduced subcontracting expenses associated with government grants.

Selling, General, and Administrative

Selling, general, and administrative (SG&A) expenses increased by $911,000, or 32%, in the three months ended March 31, 2020 compared to the three months ended March 31, 2019. The increase was primarily driven by higher consulting fees and consultants' stock compensation expense, and higher employee-related expenses.

Other Income, Net

Other income, net, of $72,000 for the three months ended March 31, 2020 was a decrease of $48,000, or 40%, in income when compared to the three months ended March 31, 2019. The decrease was primarily related to the lower investment balance in 2020.

Change in the Estimated Fair Value of Common Stock Warrant Liabilities

Change in the estimated fair value of $8.2 million for the three months ended March 31, 2020 includes the fair value remeasurement of the March 2018 Warrants pursuant to the March 2018 Purchase Agreement, the June 2018 Offering Warrants, June 2019 Offering Warrants, and the September 2019 Offering Warrants. The estimated fair value of the March 2018 Warrants, the June 2018 Offering Warrants, June 2019 Offering Warrants, and the September 2019 Offering Warrants decreased by $2.6 million, $3.0 million, $1.0 million, and $1.5 million, respectively, due to the decrease in the Company's stock price from December 31, 2019 to the March 31, 2020 remeasurement date.

Change in the estimated fair value of $8.5 million for the three months ended March 31, 2019 includes the fair value remeasurement of the March 2018 Warrants issued with the March 2018 Purchase Agreement and the June 2018 Offering. The estimated fair value of the March 2018 Warrants increased by $4.0 million and the estimated fair value of the June 2018 Offering Warrants increased by $4.5 million, both driven by the increase in the Company's stock price.

Income Tax Provision

Income tax provision for the three months ended March 31, 2020 of $17,000 was consistent with the provision of $19,000 recorded for three months ended March 31, 2019.

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. Often, there is only one crop-growing season per year for certain crops and markets. Similarly, climate conditions and other factors that may influence the sales of our products may vary from season to season and year to year. In particular, weather conditions, including natural disasters such as heavy rains, hurricanes, hail, floods, tornadoes, freezing conditions, drought, or fire, may affect the timing and outcome of field trials, which may delay milestone payments and the commercialization of products incorporating our seed traits. Sales of commercial products that incorporate our seed traits will vary based on crop growing seasons and weather patterns within particular regions.

Liquidity, Capital Resources, and Going Concern

We have funded our operations primarily with the net proceeds from our initial public offering, private placements of equity securities and debt, as well as proceeds from the sale of our SONOVA products and payments under license agreements, contract research agreements and government grants. Our principal use of cash is to fund our operations, which are primarily focused on completing development and commercializing our quality seed traits. This includes scaling harvest production of wheat, hemp and soy, as well as coordinating with our partners on their development programs. As of March 31, 2020, we had cash and cash equivalents of $13.0 million and short-term investments of $3.0 million. For the three months ended March 31, 2020, the Company had net income of $2.4 million and net cash used in operations of $9.3 million. For the twelve months ended December 31, 2019, the Company had net losses of $28.9 million and net cash used in operations of $17.2 million.

As is disclosed in Note 9, the Company obtained funding through two separate arrangements during the first half of 2018 and two offerings during June 2019 and September 2019. On March 19, 2018, the Company entered into securities purchase agreements with institutional investors in connection with a private placement of common stock and warrants in the amount of $10 million, exclusive of any related transaction fees. On June 11, 2018, the Company entered into agreements with institutional investors through a registered direct offering in the amount of $14 million, exclusive of any related transaction fees. On June 12, 2019, the Company entered into agreements with institutional investors through a registered direct offering in the amount of $7.5 million exclusive of any related transaction fees. In August and September 2019, investors exercised warrants, generating cash proceeds totaling $5.3 million. On September 5, 2019, the Company entered into agreements with institutional investors through a registered direct offering in the amount of $10 million exclusive of any related transaction fees.

We believe that our existing cash, cash equivalents and short-term investments will not be sufficient to meet our anticipated cash requirements for at least the next 12 months which raises substantial doubt about the Company's ability to continue as a going concern. See Note 1 of the notes to the condensed consolidated financial statements for more information.

We may seek to raise additional funds through debt or equity financings, if necessary and available. We may also consider entering into additional partner arrangements. Our sale of additional equity would result in dilution to our stockholders and could have unfavorable terms. 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 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 development programs. Any of these actions could materially harm our business, results of operations and financial condition.

At this time, there is significant uncertainty relating to the trajectory of the novel coronavirus outbreak and impact of related responses. The continued spread of the outbreak could materially harm our business, results of operations, and financial condition. Due to this uncertainty and plans outside of management's control, we may not be able to achieve and implement such plans within one year after the date that the financial statements are issued to address the substantial doubt that exists.

Cash Flows

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

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
Net cash (used in) provided by:		
Operating activities	$ (9,270)	$ (3,969)
Investing activities	13,130	2,422
Financing activities	696	(13)
Net increase (decrease) in cash	$ 4,556	$ (1,560)

Cash flows from operating activities

Cash used in operating activities for the three months ended March 31, 2020 was $9.3 million. Our net income of $2.4 million reflects adjustments in our working capital accounts of $4.4 million, non-cash income from the change in fair value of common stock warrant liabilities of $8.2 million, operating lease payments of $184,000, and amortization of investment premium of $39,000, partially offset by non-cash charges including $772,000 of stock-based compensation, $223,000 of lease amortization, and $74,000 of depreciation.

Cash used in operating activities for the three months ended March 31, 2019 was $4.0 million. Our net loss of $12.6 million, operating lease payments of $172,000 and adjustments in our working capital accounts of $269,000 were partially offset by the non-cash charges of the change in fair value of common stock warrant liabilities of $8.5 million, $422,000 for stock-based compensation, $172,000 of lease amortization and $34,000 for depreciation and amortization.

Cash flows from investing activities

Cash provided by investing activities for the three months ended March 31, 2020 consisted of $15.2 million in proceeds from sales and maturities of investments, which were offset by $1.3 million in purchases of short-term investments and $778,000 in purchases of property and equipment.

Cash provided by investing activities for the three months ended March 31, 2019 consisted of $9.2 million in proceeds from sales and maturities of investments, which were offset by $6.7 million in purchases of short-term investments and $88,000 in purchases of property and equipment.

Cash flows from financing activities

Cash provided by financing activities for the three months ended March 31, 2020 consisted of capital contributions from the non-controlling interest in our joint venture of $689,000 and proceeds from the purchase of ESPP shares of $14,000, which were offset by principal payments on notes payable of $7,000.

Cash used in financing activities for the three months ended March 31, 2019 consisted of $16,000 of payments of offering costs relating to the June 2018 Offering and $5,000 of payments of deferred offering costs. Proceeds from the purchase of ESPP shares totaled $8,000.

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 is discussed in the notes to our condensed consolidated financial statements.

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, stock-based compensation, fair value of certain equity instruments, and net realizable value of inventory. See Notes 4 and 9 for the estimates made in connection with the securities purchase agreements executed during 2018 and 2019.

As discussed in Note 2, in April 2020, the FASB issued a staff question-and-answer ("Q&A") document to respond to frequent asked questions about the accounting for lease concessions related to the effects of the COVID-19 pandemic. Under current GAAP, subsequent changes to lease payments that are not stipulated in the original lease contract are generally accounted for as lease modifications under Topic 842. The Q&A allows companies to make an accounting policy election to not evaluate lease concessions related to the effects of the COVID-19 pandemic as lease modifications. Entities that make this election then need to decide whether to apply the lease modification guidance in ASC 842 to the concession or account for the concession as if it were contemplated as part of the existing contract. The Company is currently evaluating its option to make this accounting policy election.

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, 2020 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, 2019, and the additional risk factor set forth below, 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.

Unfavorable global economic or political conditions could adversely affect our business, financial condition or results of operations.

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets. A global financial crisis or a global or regional political disruption could cause extreme volatility in the capital and credit markets. For example, outbreaks of epidemic, pandemic, or contagious diseases, such as the recent COVID-19 outbreak, could disrupt our business. Business disruptions could include disruptions to the productivity of our employees working remotely and restrictions on their travel may hinder their ability to meet with potential customers and close transactions, as well as temporary closures of the facilities of suppliers or contract growers in our supply chain. While we've seen very recent signs of improvement, hemp growers have been slower to make decisions to purchase hemp seeds due to economic uncertainty and wheat consumer packaged goods companies have been heavily focused on production over R&D evaluation as demand for staples like pasta and flour have increased. Import approval by China is required for the successful commercial launch of our HB4® soybean, and it is uncertain whether the pandemic will cause delays in the approval process. If there are significant delays in China's approval, our results of operations and financial condition could be materially adversely affected. In addition, the COVID-19 outbreak may result in a severe economic downturn and has already significantly affected the financial markets of many countries. A severe or prolonged economic downturn or political disruption could result in a variety of risks to our business, including our ability to raise capital when needed on acceptable terms, if at all. A weak or declining economy or political disruption could also strain our manufacturers or suppliers, possibly resulting in supply disruption, or cause our customers to delay making payments for our services. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the political or economic climate and financial market conditions could adversely impact our business.

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

During the three months ended March 31, 2020, we issued the securities described below without registration under the Securities Act. Unless otherwise indicated below, the securities were issued pursuant to the private placement exemption provided by Section 4(a)(2) of the Securities Act.

On February 3, 2020, we issued a warrant to an independent contractor entity to purchase up to 10,000 shares of our common stock. The warrant has an exercise price per share of $4.91 and a term of 2 years.

On February 12, 2020, we issued a warrant to a non-affiliated third party entity in connection with a professional services agreement to purchase up to 150,000 shares of our common stock. The warrant has an exercise price per share of $4.71 and a term of 2 years.

On March 21, 2020, we issued a warrant to a non-affiliated third party entity in connection with a professional services agreement to purchase up to 18,350 shares of our common stock. The warrant has an exercise price per share of $2.50 and a term of 2 years.

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
10.1(1)	Promissory Note, dated April 16, 2020, by and between MidFirst Bank and Arcadia Biosciences, Inc.
10.2(2)	Amendment No. 8 to the Office Lease dated March 17, 2003 between the Registrant and Pac West Office Equities, LP.
31.1	Principal Executive Officer's Certifications Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Principal Financial Officer's Certifications Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1(3)	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2(3)	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

(1) Incorporated by reference to Exhibit 10.1 filed with the Report on Form 8-K filed on April 21, 2020.
(2) Incorporated by reference to Exhibit 10.8 filed with the Report on Form 10-K filed on March 25, 2020.
(3) 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 13, 2020	By:	/s/ MATTHEW T. PLAVAN Matthew T. Plavan President and Chief Executive Officer
May 13, 2020	By:	/s/ PAMELA HALEY Pamela Haley 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, Matthew T. Plavan, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arcadia Biosciences, Inc. for the period ended March 31, 2020;
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 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)) 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; and
    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 13, 2020

/s/ MATTHEW T. PLAVAN

Matthew T. Plavan
President and Chief Executive Officer
(Principal Executive Officer)

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, Pamela Haley, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arcadia Biosciences, Inc. for the period ended March 31, 2020;
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 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)) 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; and
    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 13, 2020

/s/ PAMELA HALEY
Pamela Haley
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, 2020 (the "Report"), I, Matthew T. Plavan, 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 13, 2020

/s/ MATTHEW T. PLAVAN
Matthew T. Plavan
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, 2020 (the “Report”), I, Pamela Haley, 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 13, 2020

/s/ PAMELA HALEY

Pamela Haley
Chief Financial Officer
(Principal Financial Officer)