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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2021

OR

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

Commission File Number 001-37383

Arcadia Biosciences, Inc.

(Exact name of Registrant as specified in its Charter)

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

(530) 756-7077
(Registrant's Telephone Number, Including Area Code)

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

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES ☐ NO ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. YES ☐ NO ☐

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, a 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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES ☐ NO ☐

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the Registrant as of June 30, 2021, the last business day of the Registrant's most recently completed second fiscal quarter, was approximately $53,245,000 (based on the closing price of $2.97 on June 30, 2021 on the NASDAQ Capital Market).

The number of shares outstanding of the Registrant's common stock on March 24, 2022, was 22,188,918 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Information required by Part III of this Annual Report on Form 10-K is incorporated by reference to the Registrant's Definitive Proxy Statement for its 2021 Annual Meeting of Stockholders, which proxy statement will be filed with the Securities and Exchange Commission within 120 days after the end of the fiscal year covered by this Form 10-K.

INTRODUCTION

“Arcadia,” the “Company,” “we,” “our” and “us” are used interchangeably to refer to Arcadia Biosciences, Inc. and its subsidiaries.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements within the meaning of the federal securities laws, which statements involve substantial risks and uncertainties. Forward-looking statements generally relate to future events, our future financial or operating performance, growth strategies, anticipated trends in our industry, and our potential opportunities, plans, and objectives. In some cases, you can identify forward-looking statements because they contain words such as "may," "will," "should," "expects," "plans," "anticipates," "could," "intends," "target," "projects," "contemplates," "believes," "estimates," "predicts," "potential," or "continue" or the negative of these words or other similar terms or expressions that concern our expectations, strategy, plans, or intentions. Forward-looking statements contained in this Annual Report on Form 10-K include, but are not limited to, statements about:

- our or our collaborators' ability to develop commercial products that incorporate our traits and complete the regulatory process for such products;
- our ability to earn revenues from the sale of products that incorporate our traits;
- our ability to maintain our strategic collaborations and joint ventures and enter into new arrangements;
- estimated commercial value for traits;
- market conditions for products, including competitive factors and the supply and pricing of competing products;
- compliance with laws and regulations that impact our business, and changes to such laws and regulations;
- our ability to maintain, protect, and enhance our intellectual property;
- our future capital requirements and our ability to satisfy our capital needs;
- industry conditions and market conditions;
- the preceding and other factors discussed in Part I, Item 1A, “Risk Factors,” and other reports we may file with the Securities and Exchange Commission from time to time; and
- the factors set forth in Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations.”

We caution you that the foregoing list may not contain all of the forward-looking statements made in this Annual Report on Form 10-K.

You should not rely upon forward-looking statements as predictions of future events. We have based the forward-looking statements contained in this Annual Report on Form 10-K primarily on our current expectations and projections about future events and trends that we believe may affect our business, financial condition, results of operations and prospects. The outcome of the events described in these forward-looking statements is subject to risks, uncertainties and other factors described in the section titled "Risk Factors" and elsewhere in this Annual Report on Form 10-K. Moreover, we operate in a very competitive and rapidly changing environment. New risks and uncertainties emerge from time to time and it is not possible for us to predict all risks and uncertainties that could have an impact on the forward-looking statements contained in this Annual Report on Form 10-K. We cannot assure you that the results, events and circumstances reflected in the forward-looking statements will be achieved or occur, and actual results, events or circumstances could differ materially from those described in the forward-looking statements.

The forward-looking statements made in this Annual Report on Form 10-K relate only to events as of the date on which the statements are made. We undertake no obligation to update any forward-looking statements to reflect events or circumstances or to reflect new information or the occurrence of unanticipated events, except as required by law.

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PART I

Item 1. Business.

Overview

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

Our commercial strategy is to satisfy consumer 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. The acquisition of the Lief, EKO and Zola brands allows us to broaden our reach within the health and wellness sector.

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

Our Growth Strategy

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

- ***Accelerate the monetization of our GoodWheat™ wheat trait portfolio.*** Our proprietary IP with multiple non-GMO wheat traits have clear functional benefits, and we will continue to build partnerships across the wheat value chain. We will continue to invest in acquisition, development and retention of the requisite management and industry experience and production and logistics capacity to fully participate in, and control, the route to market for our high value food ingredients.
- ***Commercialize and Scale our Arcadia Wellness consumer brands through retail and e-commerce expansion.*** We plan to expand distribution of our core consumer brands through mass market retailers, grocery store chains, and other specialty nutrition stores, as well as through e-commerce. These brands can penetrate large and growing categories through high-value, differentiated benefits, with the ability to scale and generate attractive margins. We will continue to build our commercialization and scaling expertise, refine go-to-market strategies and invest in effective brand-building.
- ***Evaluate acquisitive growth opportunities.*** We intend to evaluate potential acquisitions representing vertical integration opportunities with multiple benefits to Arcadia's growth plans. These could include integrating further into our supply chains to enhance margin capture, as well as speed to market new product innovations and food formulations.

Arcadia Wellness, LLC

In May 2021, our wholly-owned subsidiary Arcadia Wellness, LLC, acquired the assets of Eko, Lief, and Zola. We intend for Arcadia Wellness, LLC, to house all of Arcadia Biosciences consumer goods businesses, including core brands GoodWheat, Zola Coconut Water and ProVault Topical Pain Relief, as well as non-core brands SoulSpring and Saavy Naturals Body Care. The core brands will be the focus for investment and expansion.

Our Product Portfolio

GoodWheat™ Consumer Products

The GoodWheat brand is a portfolio of non-GMO wheat-based consumer products that simplifies food ingredient formulations for consumers that are demanding "clean labeling" in their foods, and that are willing to pay a higher retail price for products 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 and cost effectively 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.

We are preparing for the launch of a line of food products under our GoodWheat brand, with pasta as the initial category to be introduced in the second quarter of 2022. Our pasta products will utilize our GoodWheat grain as the sole ingredient, providing 4X the fiber of traditional pasta and 9g protein per serving without sacrificing taste. In fact, our research shows taste parity to leading pasta brands, which is unique in the growing better-for-you pasta segment. In addition, GoodWheat is the only better-for-you pasta brand made from one simple ingredient, matching consumers' preference for cleaner labels. Additional categories of products are slated for launch in 2023.

Zola Coconut Water

We believe that natural hydration and the power of plant-based ingredients are the keys to unlock your inspiration from within, and we are proud to make delicious plant-powered beverages that provide the energy and focus you need to crush your day. From the coconut groves of Thailand, we bring you great tasting coconut water and are proud of our long-lasting relationships with partners around the world who are essential to the quality of our products.

ProVault Topical Pain Relief

ProVault's proprietary THC-Free, CBD-infused blend of natural ingredients and fast-acting cooling agents are designed to safely and effectively relieve muscle and joint pain and soothe your skin. Our products are third-party tested for potency and purity from pesticides, fungicides, microbials and heavy metals. Our topical pain relievers are formulated to address performance concerns from everyday pain to skin protection. So whether you're a true competitor, a weekend warrior or simply maintaining an active lifestyle, you can count on ProVault to help keep you in the game. We believe what you put *on* your body is just as important as what you put *in* your body.

SoulSpring Body Care

Inspired by nature's ancient remedies and crafted with care, our SoulSpring products strive to help rejuvenate and renew your mind, body, and soul. Our CBD-infused blends of natural ingredients provide a more thoughtful, holistic approach to internal balance and overall well-being. SoulSpring premium, broad spectrum CBD is extracted from naturally-grown hemp and blended with nourishing botanicals and minerals. Our CBD is purity-tested, non-pshychoactive and non-intoxicating. Our passion for wellness means thoughtfully choosing honest, natural ingredients - inspired by ancient remedies and carefully selected for their healing properties. We then mindfully blend these ingredients to retain their inner essence and natural properties.

Saavy Naturals Body Care

Saavy Naturals products are plant-based, simple and natural. Saavy Naturals products never contain parabens, silicones, sulfates, phenoxyethanol, propylene glycol PEGs, petroleum products, artificial colors or fragrances. Rigorous third-party testing ensures adherence to our strict standards. We're that daily feel-good little luxury that can make all the difference.

GoodWheat™ Wheat Traits

Enhanced Quality Grains

The GoodWheat brand also encompasses our current and future non-GMO wheat portfolio of high fiber Resistant Starch (RS), Reduced Gluten wheat varieties, and extended shelf life wheat, as well as future wheat innovations. 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 recently strengthen our intellectual property for our Resistant Starch portfolio of products.

Our GoodWheat™ wheat traits redesign wheat as a functional food adding value to the wheat supply chain by enabling a wider range of choices to meet consumer demands. One such program generated multiple bread wheat and pasta wheat lines with very high levels of amylose, leading to increased levels of resistant starch. Resistant starch increases the total dietary fiber content of wheat and reduces its glycemic index, which are both desirable nutritional qualities that are important in the management of diabetes and healthy blood glucose levels. High fiber resistant starch wheat can deliver fiber and other benefits to refined white flour products and also whole grain food products. According to the American Heart Association, on average, Americans consume only approximately 50% of the daily recommended levels of fiber. We believe improving the fiber content of wheat can deliver improved health benefits to a wide population.

High Fiber Resistant Starch Wheat

Our high fiber resistant starch (RS) wheat provides a source of wheat with inherently high levels of resistant starch, increasing the total dietary fiber content of food products without the need for fiber additives from other sources. Currently, corn resistant starch is a product in two market segments: dietary fiber additives and modified starch additives. Major growth in these markets is being driven by the convenience health food sector and functional food sector. Flour from our RS wheat lines has resistant starch levels that are 12 to 20 times higher than the control wheat, and total dietary fiber, or TDF, which is more than eight times higher than the control. RS wheat flour has been tested in applications in bread, where loaf quality was comparable to bread made with conventional wheat flour, and pasta, where it had the highest consumer preference rankings in tests carried out by a major consumer products company.

RS wheat bread flour is currently being introduced to North American bakery and consumer packaged goods (CPG) companies by our partners, Bay State Milling. In markets outside North America, RS wheat is currently being tested in a range of additional bakery, ready-to-eat cereals and pasta products with industrial partners. We have many RS wheat lines that are being evaluated for optimal quality and agronomic characteristics.

Reduced Gluten (RG) Wheat

Many consumers are interested in reducing levels of gluten in their diet. Critically, for some, this is due to having Celiac disease (CD), an autoimmune disease that impacts many people worldwide with estimates from 1% of the population in Europe to 3.5% in Mexico. Furthermore, non-celiac gluten sensitivity (NCGS) impacts an estimated additional 6% of the population. Both CD and NCGS are characterized by sensitivity to dietary gluten. The only effective treatment of CD and NCGS requires removal of gluten sources from the diet. Since required adherence to a gluten-free diet is extremely difficult to accomplish for average consumers, efforts to develop alternative approaches are needed.

Arcadia is continuing to advance a new wheat variety with reduced gluten levels. Our proprietary, non-GMO wheat variety developed using advanced screening and plant breeding techniques have reduced allergenic glutens and increased essential amino acids such as lysine, along with all the other health benefits of high protein wheat. Importantly, this variety also delivers impressively high fiber content at approximately 14 grams per serving compared to 2-3 grams per serving of traditional wheat, providing additional value to health-conscious consumers as well as optionality as we advance the commercialization of this project. We are breeding the trait into additional commercial wheat varieties and working with food processors to give people a choice to enjoy higher quality wheat in the products they love while reducing gluten in their diet.

Improved Shelf Life of Whole Grain Flour

The USDA recommends that "at least one serving of grains per day must be whole grain-rich" due to evidence that a diet containing whole grains provides a multitude of benefits, including lower risk of obesity, cardiovascular disease, and type-2 diabetes. Despite these health benefits, consumption of whole grain products is negatively affected by the bitter and rancid flavors and odors that accumulate in whole wheat flour after milling. Our improved stability and flavor wheat lines greatly reduced the production of rancid and bitter compounds in milled whole grain flour as it progresses through the supply chain. Whole wheat flour from these lines is being tested further for sensory characteristics and improved shelf life stability. This new trait could help improve the shelf life and flavor profile of whole grain products, thus reducing formulation costs and increasing consumer preference and palatability for whole grains.

Product Development

With our food and wellness products now entering the market, we are firmly in the commercialization phase of our corporate lifecycle. We are de-emphasizing new trait discovery research and development ("R&D") and are increasing our focus on food-science innovation to fully leverage the value in our existing superior wheat genetics. We are evolving our organizational capabilities to match this strategy progression to include in-house food formulation and CPG supply chain expertise.

Food Formulation Innovation. We will expand the application of our innovation platform to build on our pipeline of products focused on health and wellness. Our innovation team is focused on using science-based solutions to leverage our wheat and hemp varieties to develop an array of food products and wellness ingredients. Because we are innovating directly from our own well-established plant technology traits, we expect this extension of our involvement will provide more meaningful improvements.

Field Trials and Breeder & Foundation Seed Production. Our trait evaluation and development staff conducts field operations for both trials and production in American Falls, Idaho, and oversee production in other areas of the country, as needed. Similarly, regulatory trials may be needed to develop data for use in submissions for regulatory review and may involve plant varieties developed by our collaborators or our own oil quality and grain quality programs.

Biological Materials Inventory and Tracking. Our proprietary Pedigree and Inventory Management System, or PIMS, tracks the genetic, phenotypic and location information for all our plant materials. The performance of our plant materials is recorded through a variety of laboratory and field observations, and the data are stored within PIMS. The location of all plant materials is tracked throughout the plant life cycle. This includes specific seeds planted within a specific plot of a specific field trial, harvest, seed storage location and use by, or distribution of plant material to, our collaborators or elsewhere. We ensure all of our plant materials are accounted for, tracked and inventoried, which enables us to maintain direct control and proper documentation.

Intellectual Property

We rely on patents and other proprietary right protections, including trade secrets and contractual protection of our proprietary know-how and confidential information, to preserve our competitive position.

As of December 31, 2021, we owned or exclusively controlled 73 issued patents, 58 pending patent applications worldwide, and 6 pending plant variety protection applications. These totals reflect the following: (i) with respect to the U.S. territory, we owned 23 and exclusively in-licensed 2 U.S. issued patents, and we owned 11 U.S. patent applications and 6 pending plant variety protection applications relating to our plants, trait technologies, and business methods; and (ii) in connection with foreign territories, we owned 28 and exclusively in-licensed 19 foreign issued patents, and owned 48 pending foreign patent applications. With respect to all of the foregoing patent and plant protection assets, our exclusive licenses afford us control over the prosecution and maintenance of the licensed patents and patent applications. These numbers do not include in-licensed patents for which we either do not have exclusive rights (such as certain enabling technology licenses), or for which we have exclusive rights only in a limited field of use or do not control prosecution and maintenance of the licensed patents.

As of December 31, 2021, Arcadia Biosciences, Inc. and Arcadia Wellness, LLC each had five registered trademarks in the United States. We also have three registered trademarks in various other countries.

Key Collaborations

We have established numerous trait collaborations and have developed close relationships with industry-leading seed and consumer product companies. Our partnerships with global strategic seed and consumer product players enable us to further participate in the development and commercialization of innovative products that promise to play significant roles in improving global crop efficiency and enhancing human health. We believe that the expertise and opportunities created by these collaborations represent important assets to our business. Below is a summary of selected collaborative partnerships that we view as key to the achievement of our near-term and mid-term business objectives.

Corteva Agriscience

In 2017, we entered into a strategic collaboration with Corteva Agriscience to jointly develop and commercialize a breakthrough improved wheat quality trait in North America. The collaboration leverages our TILLING platform with Corteva Agriscience's enabling technology platforms, high-quality elite germplasm and global commercial channels.

Under the collaboration, the companies will further develop and commercialize an improved wheat quality trait, which has completed initial field trials and is advancing to next-stage field trials. Corteva Agriscience will introgress Arcadia's trait into its proprietary elite germplasm lines and manage all aspects related to the trait commercialization. Certain development costs will be co-funded, and we will share in the commercial value resulting from products produced.

Arista Cereal Seeds Pty Ltd and Bay State Milling Company

In 2019, we entered into an agreement with Arista and Bay State Milling ("BSM"). Under the agreement, BSM is the exclusive commercial partner for our high fiber resistant starch bread wheat in North America under its HealthSense™ brand portfolio, while Arista has exclusive rights under our high fiber resistant starch bread wheat intellectual property in certain geographies, including Australia and Europe. We will continue to market our high fiber wheat under our GoodWheat portfolio of specialty wheat ingredients in other international markets.

Competition

The markets for consumer goods are highly competitive, and we face significant direct and indirect competition in several aspects of our business. We compete with both large, established manufacturers, as well as small, innovative producers of pasta and wellness products. There are several companies working to improve genetics in crops, such as wheat, that may compete with the trait used in our GoodWheat products.

In general, we believe that our competitors generally fall into the following categories:

- *Companies Selling Wheat Products:* As we enter the direct to consumer and retail markets with our GoodWheat products, we believe we face significant competition from a variety of consumer-packaged goods companies. Our competitors in the pasta market range from companies like Banza and Ancient Harvest who offer high-nutrition pasta alternatives to large, traditional pasta producers including Barilla and De Cecco.
- *Specialty health and nutrition ingredient companies*: In response to the growing consumer demand for healthier food alternatives, a number of agricultural and food-based companies are augmenting their product and market strategies to bring new quality food ingredients to market. Calyxt is an agriculture biotechnology company that has a similar strategy to ours to create healthier specialty food ingredients and agriculturally advantageous food crops.

- *Coconut water:* The beverage industry is competitive. Competitors in this market compete for brand recognition, ingredient sourcing, product shelf space, and e-commerce page rankings. Our competitors have similar distribution channels and retailers to deliver and sell their products. Competitors in this space include Vita Coco, ZICO, C20 and Harmless Harvest.
- *CBD-based wellness products:* The market for the sale of CBD-based products is fragmented and intensely competitive. Currently, we do not believe that there are any businesses that can demonstrate or claim a dominant market share of the growing CBD bath and body care products market. Our competitors of CBD-based products include a combination of public and private companies who operate a combination of e-commerce and wholesale brands as well as brick and mortar retail operations like cbdMD and Charlotte's Web.

Employees

As of December 31, 2021, we had 11 full-time employees dedicated to research and product development. Our team possesses technical expertise in a number of fields and activities have been conducted principally at our Davis and Chatsworth, California facilities, with occasional field trials conducted in American Falls, Idaho. In prior years, we have made substantial investments in research and development, and have turned our current focus to developing commercial products, anticipating future research and development expenses to decrease substantially. Our research and development expenses were $3.9 million and $8.0 million in the years ended December 31, 2021 and 2020, respectively.

As of December 31, 2021, we had 58 full-time employees. As mentioned above, 11 employees were engaged in research and product development and 47 in management, operations, commercial production, accounting/finance, legal and administration. We believe our employee relations to be good. None of our employees are represented by a labor union or collective bargaining agreement.

Diversity and Inclusion

At Arcadia, we recognize the immense benefits that a diverse team brings to our organization, including delivering better business outcomes. Our talented people leverage their diverse backgrounds and skills toward a common goal: meeting the needs of the present without compromising the ability of future generations to do the same. This spirit of inclusive collaboration can be felt throughout our Company. Our commitment to diversity begins at the highest levels of our organization, as evidenced by the fact that 50% of our Board of Directors are female. From a management perspective, 60% of our CEO's direct reports are female, racially or ethnically diverse, which we believe sets the right tone and expectation for diversity and inclusion within the Company. More broadly, 52% of our employees are female.

Environmental, Social and Governance ("ESG")

Since our founding, Arcadia has been on a mission to enhance crop yields by enabling plants to more efficiently manage environmental and nutrient stresses, and to enhance the quality and value of agricultural and food products. Now that Arcadia has evolved to its commercial stage, the goal is still to lead in a safe, scalable, efficient, and sustainable way. Our Board of Directors oversees ESG matters, and is committed to advancing a sustainable development through our products, working to systematically grow our business to meet the challenges of the global energy transition and combat the global climate crisis.

Facilities

Our corporate headquarters are located in Davis, California, in a facility consisting of approximately 9,224 square feet of office, laboratory and growth chamber space under a lease which expires on March 31, 2025. This facility accommodates research and development, finance and accounting, investor relations, and administrative activities. Our manufacturing plant is located in Chatsworth, California, in a facility consisting of approximately 14,720 square feet of office, warehouse and production lines. We lease greenhouse space and farmland for agricultural use in Northern California, Idaho, and Hawaii.

We believe that our leased facilities are adequate to meet our current needs and that, if needed, suitable additional or alternative space will be available to accommodate our operations.

Item 1A. Risk Factors.

You should carefully consider the following risk factors, in addition to the other information contained in this report on Form 10-K, including the section of this report titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and related notes. If any of the events described in the following risk factors and the risks described elsewhere in this report occurs, our business, operating results and financial condition could be seriously harmed. This report on Form 10-K also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in the forward-looking statements as a result of factors that are described below and elsewhere in this report.

Risks Related to Our Hemp Business

We will be subject to a myriad of different laws and regulations governing hemp and our inability to comply with such laws in a cost-effective manner may have an adverse effect on our business and result of operations.

Laws and regulations governing the use of hemp in the United States are broad in scope, subject to evolving interpretations, and subject to enforcement by a myriad of regulatory agencies and law enforcement entities. Under the Agriculture Improvement Act of 2018, also known as the 2018 Farm Bill, a state or Indian tribe that desires to have primary regulatory authority over the production of hemp in the state or territory of the Indian tribe must submit a plan to monitor and regulate hemp production to the Secretary of the USDA. The Secretary must then approve the state or tribal plan after determining if the plan complies with the requirements set forth in the Agriculture Improvement Act of 2018. The Secretary may also audit the state or Indian tribe's compliance with the federally-approved plan. If the Secretary does not approve the state or Indian tribe's plan, then the production of hemp in that state or territory of that Indian tribe will be subject to a plan established by USDA. USDA published a final rule on January 19, 2021, that provided regulations for the production of hemp in the USA that went into effect on March 22, 2021. We anticipate that some states will seek to have primary regulatory authority over the production of hemp. States that seek such authority may create new laws and regulations that limit or restrict the use of hemp.

Federal and state laws and regulations on hemp may address production, monitoring, manufacturing, distribution, and laboratory testing to ensure that that the hemp has a delta-9 tetrahydrocannabinol concentration of not more than 0.3% on a dry weight basis. Federal laws and regulations may also address the transportation or shipment of hemp or hemp products, as the Agriculture Improvement Act of 2018 prohibits states and Indian tribes from prohibiting the transportation or shipment of hemp or hemp products produced in accordance with that law through the state or territory of the Indian tribe, as applicable. We may be subject to many different state-based regulatory regimens for hemp, all of which could require us to incur substantial costs associated with compliance requirements. Our research and development operations will be restricted to only where such operations are legal on the local, state and federal levels.

The DEA issued an interim final rule to codify statutory amendments to the controlled substances act made by the 2018 farm bill. It is possible that the DEA will make additional changes in a final rule that may have a material impact on our hemp business and our ability to operate.

The Food and Drug Administration has published guidance related to the CBD and hemp-extract business but has not formally released a regulatory framework for the industry. It is possible that the FDA will provide additional guidance or implement future regulations that may have a material impact on our hemp business.

In addition, it is possible that additional regulations may be enacted in the future in the United States and globally that will be directly applicable to our research and development operations. We cannot predict the nature of any future laws, regulations, interpretations, or applications, nor can we determine what effect additional governmental regulations or administrative policies and procedures, when and if promulgated, could have on our business.

There is limited operating history in the legal hemp or cannabis industry, which makes it difficult to accurately assess our future growth prospects.

The legal hemp and cannabis industry is an evolving industry that may not develop as expected. Furthermore, our operations continue to evolve as we continually assess new strategic opportunities for our business within this industry. Assessing the future prospects of this industry is challenging in light of both known and unknown risks and difficulties we may encounter. Growth prospects in the legal hemp and cannabis industry can be affected by a wide variety of factors including:

- Competition from other similar companies;
- Fluctuations in the market price of hemp seeds and CBD oil;
- Regulatory limitations on the types of research and development with respect to cannabis;
- Other changes in the regulation of cannabis and legal hemp use; and
- Changes in underlying consumer behavior, which may affect the demand of our legal hemp and cannabis traits.

We may not be able to successfully address the above factors, which could negatively impact our intended business plans and financial statements.

Negative press from being in the hemp/cannabis space could have a material adverse effect on our business, financial condition, and results of operations.

The hemp plant and the cannabis/marijuana plant are both part of the same *cannabis sativa* genus/species of plant, except that hemp, by definition, has less than 0.3% THC content, but the same plant with a higher THC content is cannabis/marijuana, which is legal under certain state laws, but which is not legal under federal law. The similarities between these plants can cause confusion, and our activities with legal hemp may be incorrectly perceived as us being involved in federally illegal cannabis. Also, despite growing support for the cannabis industry and legalization of cannabis in certain U.S. states, many individuals and businesses remain opposed to the cannabis industry. Any negative press resulting from any incorrect perception that we have entered into the cannabis space could result in a loss of current or future business. It could also adversely affect the public's perception of us and lead to reluctance by new parties to do business with us or to own our common stock. We cannot assure you that additional business partners, including but not limited to financial institutions and customers, will not attempt to end or curtail their relationships with us. Any such negative press or cessation of business could have a material adverse effect on our business, financial condition, and results of operations.

Risks Related to Our Business and Our Other Industries

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 current COVID-19 pandemic, 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. 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.

We or our partners may not be successful in developing commercial products that incorporate our traits and for which there is consumer demand.

Our future growth depends on our ability to monetize the trait assets we've created by bringing products to market that incorporate our technology, as well as licensing these traits to our collaborators to develop and

commercialize seeds and products that contain our traits. The development process could take longer than we anticipate or could ultimately fail to achieve commercial success for any of the following reasons, including but not limited to: non-competitive pricing, ineffective advertising and marketing campaigns, increased competition, failure to align with consumer tastes and lack of brand acceptance.

If products containing our traits are never commercialized or are not well-received in the marketplace, our ability to generate revenues and become profitable, as well as our long-term growth strategy, would be materially and adversely affected. Even if we or our collaborators are able to develop commercial products that incorporate our traits, any such products may not achieve commercial success as quickly as we project, or at all.

We have a history of significant losses, which we expect to continue, and we may never achieve or maintain profitability.

We have incurred significant net losses since our formation in 2002 and expect to continue to incur net losses for the foreseeable future. We incurred net losses of $16.1 million, and $6.0 million for the years ended December 31, 2021 and 2020, respectively. As of December 31, 2021, we had an accumulated deficit of $226.5 million. Net cash used in operations was $25.9 million and $30.2 million for the years ended December 31, 2021 and 2020, respectively. We expect to continue to incur losses. Because we have incurred and will continue to incur significant costs and expenses for these efforts before we obtain any incremental revenues from the sale of seeds or products incorporating our traits, our losses in future periods could be even more significant. In addition, we may find our development and commercialization efforts are more expensive than we anticipate or that they do not generate revenues in the time period we anticipate, which would further increase our losses. If we are unable to adequately control the costs associated with operating our business, including costs of development and commercialization of our traits, our business, financial condition, operating results, and prospects will suffer.

We may require additional financing and may not be able to obtain such financing on favorable terms, if at all, which could force us to delay, reduce, or eliminate our research and development activities.

We will continue to need capital to fund our development projects, the commercialization of our products, and to provide working capital to fund other aspects of our business. If our capital resources are insufficient to meet our capital requirements, we will have to raise additional funds. If future financings involve the issuance of equity securities, our existing stockholders would suffer dilution. If we are able to raise debt financing, we may be subject to restrictive covenants that limit our operating flexibility. We may not be able to raise sufficient additional funds on terms that are favorable to us, if at all. If we fail to raise sufficient funds and continue to incur losses, our ability to fund our operations, take advantage of strategic opportunities, develop and commercialize products or technologies, or otherwise respond to competitive pressures could be significantly limited. If this happens, we may be forced to delay or terminate research and development programs or the commercialization of products or curtail operations. If adequate funds are not available, we will not be able to successfully execute on our business strategy or continue our business.

Our gross profit margins on the products we've recently introduced containing our GoodWheat as an ingredient may be impacted by a variety of factors, including but not limited to, variations in raw materials and packaging pricing, customer requirements, market acceptance rate and promotional support costs.

We expect that our gross profit as a percentage of net sales could fluctuate as a result of a number of factors, including product pricing, retail discounts, and the availability and cost of ingredients and packaging. In addition, our gross profit margin may be impacted by shifts in the overall mix of products having a higher or lower profit margin. If we are not able to increase our selling prices or reduce product sizes sufficiently, or in a timely manner, to offset increased raw material, packaging, or other input costs, or if our sales volume decreases significantly, there could be a negative impact on our financial condition and results of operations. Should the rate of market acceptance of our products be slower than anticipated, we may incur additional expense by increasing promotional activities.

Competition is intense and requires continuous technological development, and, if we are unable to compete effectively, our financial results will suffer.

We face significant competition in the markets in which we operate. The markets for pasta, body care and coconut water products are intensely competitive and rapidly changing. In most segments of the seed and agricultural biotechnology market, the number of products available to consumers is steadily increasing as new

products are introduced. At the same time, the expiration of patents covering existing products reduces the barriers to entry for competitors. We may be unable to compete successfully against our current and future competitors, which may result in price reductions, reduced margins and the inability to achieve market acceptance for products containing our traits. In addition, several of our competitors have substantially greater financial, marketing, sales, distribution, research and development, and technical resources than us, and some of our collaborators have more experience in research and development, regulatory matters, manufacturing, and marketing. We anticipate increased competition in the future as new companies enter the market and new technologies become available. Our technologies may be rendered obsolete or uneconomical by technological advances or entirely different approaches developed by one or more of our competitors, which will prevent or limit our ability to generate revenues from the commercialization of our traits being developed.

We rely on third parties to conduct, monitor, support, and oversee field trials and commercial production and, in some cases, to maintain regulatory files for those products in development, and any performance issues by third parties, or our inability to engage third parties on acceptable terms, may impact our or our collaborators' ability to complete the regulatory process for or commercialize such products.

We rely on third parties, including farmers, to conduct, monitor, support, and oversee field trials and commercial production. As a result, we have less control over the timing and cost of these activities than if we conducted them with our own personnel. If we are unable to maintain or enter into agreements with these third parties on acceptable terms, or if any such engagement is terminated prematurely, we may be unable to conduct and complete our trials and commercial production in the manner we anticipate. In addition, there is no guarantee that these third parties will devote adequate time and resources to our activities or perform as required by our contract or in accordance with regulatory requirements, including maintenance of field trial or production information. If these third parties fail to meet expected deadlines, fail to transfer to us any regulatory or other information in a timely manner, fail to adhere to protocols, or fail to act in accordance with regulatory requirements or our agreements with them, or if they otherwise perform in a substandard manner or in a way that compromises the quality or accuracy of their activities or the data they obtain, then field trials and commercial production of our products in development may be extended or delayed with additional costs incurred, or our data may be rejected by the USDA or FDA, the U.S. Environmental Protection Agency, or EPA, or other regulatory agencies. Ultimately, we are responsible for ensuring that each of our field trials and commercial production is conducted in accordance with the applicable protocol, legal, regulatory and scientific standards, and our reliance on third parties does not relieve us of our responsibilities.

If our relationship with any of these third parties is terminated, we may be unable to enter into arrangements with alternative parties on commercially reasonable terms, or at all. Switching or adding growers or other suppliers can involve substantial cost and require extensive management time and focus. In addition, there is a natural transition period when a new farmer or other third party commences work. As a result, delays may occur, which can materially impact our ability to meet our desired development or commercial timelines. If we are required to seek alternative supply arrangements, the resulting delays and potential inability to find a suitable replacement could materially and adversely impact our business.

Most of our collaborators have significant resources and development capabilities and may develop their own products that compete with or negatively impact the advancement or sale of products containing our traits.

Most of our collaborators are significantly larger than us and may have substantially greater resources and development capabilities. As a result, we are subject to competition from many of our collaborators, who could develop or pursue competing products and traits that may ultimately prove more commercially viable than our traits. In addition, former collaborators, by virtue of having had access to our proprietary technology, may utilize this insight for their own development efforts, despite the fact that our collaboration agreements prohibit such use. The development or launch of a competing product by a collaborator may adversely affect the advancement and commercialization of any traits we develop and any associated research and development and milestone payments and value-sharing payments we receive from the sale of products containing our traits.

We depend on our key personnel and, if we are not able to attract and retain qualified technical and business personnel, we may not be able to grow our business or develop and commercialize our products.

Our future performance depends on the continued services and contributions of our management team and other key employees, the loss of whose services might significantly delay or prevent the achievement of our technical or business objectives. The replacement of any member of our management team involves significant time and costs and such loss could significantly delay or prevent the achievement of our business objectives. A member of our leadership team who has been our employee for many years and therefore, has significant experience and understanding of our business, would be difficult to replace.

Additionally, the majority of our workforce is involved in development and commercial activities. Our business is therefore dependent on our ability to recruit and maintain a highly skilled and educated workforce with expertise in a range of disciplines, including food innovation, supply chain management, agribusiness, marketing, and other subjects relevant to our operations. All of our current employees are at-will employees, and the failure to retain or hire skilled and highly educated personnel could limit our growth and hinder our research and development efforts.

Our business is subject to the risks of earthquakes, fire, flood, crop losses, epidemics, and other catastrophic natural events, and security breaches, including cybersecurity incidents.

Our seed, grain and hemp crops are vulnerable to adverse weather conditions, including windstorms, floods, drought and temperature extremes, which are common but difficult to predict. In addition, the crops are vulnerable to crop disease and to pests, which may vary in severity and effect, depending on the stage of production at the time of infection or infestation, the type of treatment applied and climatic conditions. Unfavorable growing conditions can reduce both crop size and quality. Weather conditions, disease or pest infestation could damage the crop in spite of precautions we would normally take to avoid such losses. We take precautions to safeguard our facilities, including insurance, health and safety protocols, and off-site storage of critical research results and computer data. However, a natural disaster, such as a fire, flood, or earthquake, could cause substantial delays in our operations, damage or destroy our equipment, inventory, or development projects, and cause us to incur additional expenses. The insurance we maintain against natural disasters may not be adequate to cover our losses in any particular case.

We utilize and critically rely upon information technology systems in all aspects of our business, including increasingly large amounts of data to support our products and advance our research and development. Failure to effectively prevent, detect, and recover from the increasing number and sophistication of information security threats could result in theft, misuse, modification, and destruction of information, including trade secrets and confidential business information, and cause business disruptions, delays in research and development, and reputational damage, which could significantly affect our results of operations and financial condition.

Our use of hazardous materials exposes us to potential liabilities.

Certain of our operations involve the storage and controlled use of hazardous materials, including laboratory chemicals, herbicides, and pesticides. This requires us to conduct our operations in compliance with applicable environmental and safety standards, and we cannot completely eliminate the risk of accidental contamination from hazardous materials. In the event of such contamination, we may be held liable for significant damages or fines, which could have a material adverse effect on our business and operating results.

Most of the licenses we grant to our collaborators to use our proprietary genes in certain crops are exclusive within certain jurisdictions, which limits our licensing opportunities.

Most of the licenses we grant our collaborators to use our proprietary genes in certain crops are exclusive within specified jurisdictions, so long as our collaborators comply with certain diligence requirements. That means that once genes are licensed to a collaborator in a specified crop or crops, we are generally prohibited from licensing those genes to any third party. The limitations imposed by these exclusive licenses could prevent us from expanding our business and increasing our product development initiatives with new collaborators, both of which could adversely affect our business and results of operations.

Our commercial success depends on our ability to protect our intellectual property and our proprietary technologies and on the ability to operate without infringing the patents and other proprietary rights of third parties.

Our success will depend in part on our ability to obtain and maintain patent protection both in the United States and in other countries for any products we successfully develop. The patents and patent applications in our patent portfolio are either owned by us, exclusively licensed to us, or co-owned by us and others and exclusively licensed to us. Our ability to protect any products we successfully develop from unauthorized or infringing use by third parties depends substantially on our ability to obtain and maintain valid and enforceable patents. Due to evolving legal standards relating to the patentability, validity and enforceability of patents covering biotechnology inventions and the scope of claims made under these patents, our ability to obtain and enforce patents is uncertain and involves complex legal and factual questions. Accordingly, rights under any issued patents may not provide us with sufficient protection for any products we successfully develop or provide sufficient protection to afford us a commercial advantage against our competitors or their competitive products or processes. In addition, we cannot guarantee that any patents will be issued from any pending or future patent applications owned by or licensed to us. Even if patents have been issued or will be issued, we cannot guarantee that the claims of these patents are, or will be, valid or enforceable, or provide us with any significant protection against competitive products or otherwise be commercially valuable to us.

The U.S. Congress passed the Leahy-Smith America Invents Act, or the America Invents Act, which was signed into law in September 2011. The America Invents Act reforms U.S. patent law in part by changing the standard for patent approval from a "first to invent" standard to a "first inventor to file" standard and developing a post-grant review system. This new legislation affects U.S. patent law in a manner that may impact our ability to obtain or maintain patent protection for current or future inventions in the U.S. or otherwise cause uncertainty as to our patent protection.

We may not have identified all patents, published applications or published literature that may affect our business, either by blocking our ability to commercialize our traits, by preventing the patentability of our traits by us, our licensors or co-owners, or by covering the same or similar technologies that may invalidate our patents, limiting the scope of our future patent claims or adversely affecting our ability to market our products. For example, patent applications are maintained in confidence for at least 18 months after their filing. In some cases, patent applications remain confidential in the United States Patent and Trademark Office ("USPTO") for the entire time prior to issuance of a U.S. patent. Patent applications filed in countries outside the United States are not typically published until at least 18 months from their first filing date. Similarly, publication of discoveries in the scientific or patent literature often lags behind actual discoveries. Therefore, we cannot be certain that we or our licensors or co-owners were the first to invent, or the first inventors to file, patent applications on our processes, products or their uses. In the event that another party has filed a U.S. patent application covering the same invention as one of our patent applications or patents, we may have to participate in an adversarial proceeding, known as an interference, declared by the USPTO to determine priority of invention in the United States.

If we or one of our collaborators are sued for infringing the intellectual property rights of a third party, such litigation could be costly and time consuming and could prevent us or our collaborators from developing or commercializing our products.

Our ability to generate significant revenues from our products depends on our and our collaborators' ability to develop, market and sell our products and utilize our proprietary technology without infringing the intellectual property and other rights of any third parties. In the United States and abroad there are numerous third-party patents and patent applications that may be applied toward our proprietary technology, business processes, or developed traits, some of which may be construed as containing claims that cover the subject matter of our products or intellectual property. Because of the rapid pace of technological change, the confidentiality of patent applications in some jurisdictions (including U.S. provisional patent applications), and the fact that patent applications can take many years to issue, there may be currently pending applications that are unknown to us that may later result in issued patents upon which our products in development or proprietary technologies infringe. Similarly, there may be issued patents relevant to our products in development of which we are not aware. These patents could reduce the value of the traits we develop or the plants containing our traits or, to the extent they cover key technologies on which we have unknowingly relied, require that we seek to obtain licenses or cease using the technology, no matter how valuable to our business. We may not be able to obtain such a license on commercially reasonable terms. If any third-party patent or patent application covers our intellectual property or proprietary rights and we are not able to obtain a license to it, we and our collaborators may be prevented from commercializing products containing our traits.

As the agricultural biotechnology industry continues to develop, we may become party to, or threatened with, litigation or other adverse proceedings regarding intellectual property or proprietary rights in our technology, processes, or developed traits. Third parties may assert claims based on existing or future intellectual property rights and the outcome of any proceedings is subject to uncertainties that cannot be adequately quantified in advance. Any litigation proceedings could be costly and time consuming, and negative outcomes could result in liability for monetary damages, including treble damages and attorneys' fees, if we are found to have willfully infringed a patent. There is also no guarantee that we would be able to obtain a license under such infringed intellectual property on commercially reasonable terms or at all. A finding of infringement could prevent us or our collaborators from developing, marketing or selling a product or force us to cease some or all of our business operations. Even if we are successful in these proceedings, we may incur substantial costs and the time and attention of our management and scientific personnel may be diverted as a result of these proceedings, which could have a material adverse effect on us. Claims that we have misappropriated the confidential information or trade secrets of third parties could similarly have a negative impact on our business.

Our success will depend in part on our ability to uphold and enforce patents or patent applications owned or co-owned by us or licensed to us, which cover products we successfully develop. Proceedings involving our patents or patent applications could result in adverse decisions regarding:

- ownership of patents and patent applications;
- rights concerning licenses;
- the patentability of our inventions relating to our products; and/or
- the enforceability, validity or scope of protection offered by our patents relating to our products.

Even if we are successful in these proceedings, we may incur substantial costs and divert management's time and attention in pursuing these proceedings, which could have a material adverse effect on us.

We are subject to governmental export and import controls that could impair our ability to compete in international markets due to licensing requirements and subject us to liability if we are not in compliance with applicable laws.

Our products and products in development are subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, and various economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls. Exports of our products and technology must be made in compliance with these laws and regulations. If we fail to comply with these laws and regulations, we and certain of our employees could be subject to substantial civil or criminal penalties, including the possible loss of export or import privileges; fines, which may be imposed on us and responsible employees or managers; and, in extreme cases, the incarceration of responsible employees or managers.

In addition, changes in our products or solutions or changes in applicable export or import laws and regulations may create delays in the introduction and sale of our products and solutions in international markets, prevent our customers from deploying our products and solutions or, in some cases, prevent the export or import of our products and solutions to certain countries, governments or persons altogether. Any change in export or import laws and regulations, shift in the enforcement or scope of existing laws and regulations, or change in the countries, governments, persons or technologies targeted by such laws and regulations, could also result in decreased use of our products and solutions, or in our decreased ability to export or sell our products and solutions to existing or potential customers. Any decreased use of our products and solutions or limitation on our ability to export or sell our products and solutions would likely adversely affect our business, financial condition and results of operations.

Adverse outcomes in future legal proceedings could subject us to substantial damages and adversely affect our results of operations and profitability.

We may become party to legal proceedings, including matters involving personnel and employment issues, personal injury, environmental matters, and other proceedings. Some of these potential proceedings could result in substantial damages or payment awards that exceed our insurance coverage. We will estimate our exposure to any future legal proceedings and establish provisions for the estimated liabilities where it is reasonably possible to estimate and where an adverse outcome is probable. Assessing and predicting the outcome of these matters will involve substantial uncertainties. Furthermore, even if the outcome is ultimately in our favor, our costs associated with such litigation may be material. Adverse outcomes in future legal proceedings or the costs and expenses associated therewith could have an adverse effect on our results of operations.

We may be required to pay substantial damages as a result of product liability claims for which insurance coverage is not available.

We are subject to product liability claims with respect to our products, and as additional products integrating our traits reach commercialization, product liability claims may increasingly be a commercial risk for our business. Product liability claims against us or our collaborators selling products that contain our traits, or allegations of product liability relating to seeds containing traits developed by us, could damage our reputation, harm our relationships with our collaborators, and materially and adversely affect our business, results of operations, financial condition, and prospects. Furthermore, while our collaboration agreements typically require that our collaborators indemnify us for the cost of product liability claims brought against us as a result of our collaborator's misconduct, such indemnification provisions may not always be enforced, and we may receive no indemnification if our own misconduct contributed to the claims.

We may seek to expand through acquisitions of and investments in other brands, businesses, and assets. These acquisition activities may be unsuccessful or divert management's attention.

We may consider strategic and complementary acquisitions of and investments in other agricultural biotechnology and consumer brands, businesses or other assets, and such acquisitions or investments are subject to risks that could affect our business, including risks related to:

- the necessity of coordinating geographically disparate organizations;
- implementing common systems and controls;
- integrating personnel with diverse business and cultural backgrounds;
- integrating acquired manufacturing and production facilities, technology and products;
- combining different corporate cultures and legal systems;
- unanticipated expenses related to integration, including technical and operational integration;
- increased costs and unanticipated liabilities, including with respect to registration, environmental, health and safety matters, that may affect sales and operating results;
- retaining key employees;
- obtaining required government and third-party approvals;
- legal limitations in new jurisdictions;
- installing effective internal controls and audit procedures;
- issuing common stock that could dilute the interests of our existing stockholders;
- spending cash and incurring debt;
- assuming contingent liabilities; and
- creating additional expenses.

We may not be able to identify opportunities or complete transactions on commercially reasonable terms, or at all, or actually realize any anticipated benefits from such acquisitions or investments. Similarly, we may not be able to obtain financing for acquisitions or investments on attractive terms. In addition, the success of any acquisitions or investments also will depend, in part, on our ability to integrate the acquisition or investment with our existing operations.

As a result of being a public company, we are obligated to develop and maintain proper and effective internal control over financial reporting. We may not complete our analysis of our internal control over financial reporting in a timely manner, or these internal controls may not be determined to be effective, which may adversely affect investor confidence in our company and, as a result, the value of our common stock.

Pursuant to Section 404(a) of the Sarbanes-Oxley Act of 2002 ("the Act") and the related rules adopted by the SEC and the Public Company Accounting Oversight Board, starting with the second annual report that we filed with the SEC after the consummation of our public offering, our management is required to report on the effectiveness of our internal control over financial reporting. Section 404(b) of the Act requires that our independent registered public accounting firm will also need to attest to the effectiveness of our internal control over financial reporting if we qualify as an accelerated filer or a large accelerated filer.

In connection with the preparation of our financial statements for the years ended December 31, 2021 and 2020, we identified certain internal control deficiencies that did not rise to the level of a significant deficiency or material weakness, on an individual basis or in the aggregate. We are continuously improving our internal control environment. As a result, we may experience higher than anticipated operating expenses, as well as higher auditor fees during and after the implementation of these changes. If we are unable to implement any of the required changes to our internal control over financial reporting effectively or efficiently or are required to do so earlier than anticipated, it could adversely affect our operations, financial reporting, and results of operations and could result in an adverse opinion on internal controls from our independent registered public accounting firm.

Our ability to use our net operating loss carryforwards to offset future taxable income may be subject to certain limitations.

Under Section 382 of the Internal Revenue Code of 1986, as amended, or the Code, a corporation that undergoes an "ownership change" is subject to limitations on its ability to utilize its NOLs to offset future taxable income. A significant portion of our existing NOLs are limited due to an ownership change under IRC Section 382 that we experienced as a result of the common shares issued in connection with the January 2021 and December 2020 Offering. Future changes in our stock ownership, some of which are outside of our control, could result in an ownership change under Section 382 of the Code. If we undergo an ownership change in the future, our ability to utilize NOLs could be further limited by Section 382 of the Code. Furthermore, our ability to utilize NOLs of companies that we may acquire in the future may be subject to limitations. There is also a risk that, due to regulatory changes, such as suspensions on the use of NOLs, or other unforeseen reasons, our existing NOLs could expire or otherwise be unavailable to offset future income tax liabilities. For these reasons, we may not be able to realize a tax benefit from the use of our NOLs, whether or not we obtain profitability.

Risks Related to Ownership of Our Common Stock

Sales of a substantial number of shares of our common stock in the public market, or the perception that these sales might occur, could cause our stock price to decline.

Sales of a substantial number of our common stock in the public market, or the perception that these sales might occur, could cause the market price of our common stock to decline and could impair our ability to raise capital through the sale of additional equity securities. As of December 31, 2021, there were 22,184,235 shares of our common stock outstanding, of which approximately 21,024,743 shares were held by non-affiliates. All of our common stock is freely transferable, except shares held by our "affiliates," as defined in Rule 144 under the Securities Act.

We may also issue common stock or options to purchase shares of our common stock that under our 2015 Omnibus Equity Incentive Plan and our 2015 Employee Stock Purchase Plan. Securities issued under these plans will be registered under a Form S-8 and are freely tradable upon issuance. There were 743,109 options exercisable as of December 31, 2021 at a weighted average exercise price of $7.54.

Our stock price has been and may continue to be volatile, and you could lose all or part of your investment.

The market price of our common stock since our initial public offering has been and may continue to be volatile. Since shares of our common stock were sold in our initial public offering in May 2015 at a price of $160.00 per share, our stock price has ranged from $1.00 to $176.00, through December 31, 2021. The market price of our common stock is subject to wide fluctuations in response to various risk factors, some of which are beyond our control and may not be related to our operating performance, including:

- addition or loss of significant customers, collaborators or distributors;
- changes in laws or regulations applicable to our industry or traits;
- additions or departures of key personnel;
- the failure of securities analysts to cover our common stock after an offering;
- actual or anticipated changes in expectations regarding our performance by investors or securities analysts;
- price and volume fluctuations in the overall stock market;
- volatility in the market price and trading volume of companies in our industry or companies that investors consider comparable;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- our ability to protect our intellectual property and other proprietary rights;
- sales of our common stock by us or our stockholders;
- the expiration of contractual lock-up agreements;
- litigation involving us, our industry, or both;
- major catastrophic events; and
- general economic and market conditions and trends.

Further, the stock markets have experienced extreme price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations often have been unrelated or disproportionate to the operating performance of those companies. In addition, the stock prices of many seed and agricultural biotechnology companies have experienced wide fluctuations that have often been unrelated to the operating performance of those companies. These broad market and industry fluctuations, as well as general economic, political, and market conditions such as recessions, interest rate changes, or international currency fluctuations, may cause the market price of our common stock to decline. If the market price of our common stock fluctuates or declines, you may not realize any return on your investment and may lose some or all of your investment.

We expect our operating results to vary significantly from quarter to quarter, which may cause our stock price to fluctuate widely.

We expect our quarterly operating results to fluctuate widely and unpredictably for the following reasons, among others:

- our significant customer concentration;
- the variable timing, stage, and results of our and our collaborators' development, and regulatory activities;
- the effectiveness of our marketing and advertising efforts;
- the impact of seasonality in agricultural operations on our sales of hemp seeds and products that incorporate our wheat traits;
- adjustments to inventory due to excess or slow-moving;

- supplier, manufacturing, or quality problems; and
- variance in the timing of customer and distributor orders for our products.

Any unanticipated change in revenues or operating results is likely to cause our stock price to fluctuate since such changes reflect new information available to investors and analysts.

Because we do not expect to pay any dividends for the foreseeable future, investors may be forced to sell their stock to realize a return on their investment.

We do not anticipate that we will pay any dividends to holders of our common stock for the foreseeable future. Any payment of cash dividends will be at the discretion of our board of directors and will depend on, among other things, our results of operations, cash requirements, financial condition, contractual restrictions including compliance with covenants under our debt agreements, and other factors that our board of directors may deem relevant. Our ability to pay dividends might be restricted by the terms of any indebtedness that we incur in the future. In addition, certain of our current outstanding debt agreements prohibit us from paying cash dividends on our common stock. Consequently, you should not rely on dividends to receive a return on your investment.

Item 1B. Unresolved Staff Comments.

Not applicable.

Item 2. Properties.

Our corporate headquarters are located in Davis, California, in a facility consisting of approximately 9,224 square feet of office and laboratory space under a lease which expires on March 31, 2025. This facility accommodates research and development, accounting and other administrative activities. Our manufacturing facility in Chatsworth, California, consists of 14,720 square feet under a lease expires on May 1, 2024. We lease greenhouse space and farmland for agricultural use in Idaho, Northern California, and Hawaii. We also lease office and warehouse space in Idaho under a lease that expires on December 31, 2023.

We believe that our leased facilities are adequate to meet our current needs and that, if needed, suitable additional or alternative space will be available to accommodate our operations.

Item 3. 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 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Our common stock has been listed on the NASDAQ Stock Market under the symbol "RKDA" since May 15, 2015. Prior to May 15, 2015, there was no public trading for our common stock.

Holders of Record

As of March 24, 2022, we had 43 holders of record of our common stock. Because many of our shares of common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of beneficial stockholders represented by these record holders.

Dividend Policy

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all available funds and any future earnings for use in the operation of our business and do not anticipate paying any cash dividends in the foreseeable future. Any decision to declare and pay cash dividends in the future will be made at the discretion of our board of directors and will depend on, among other things, our results of operations, cash requirements, financial condition, contractual restrictions, and other factors that our board of directors may deem relevant.

Securities Authorized for Issuance under Equity Compensation Plans

See Part III, Item 12, for a description of securities authorized for issuance under equity compensation plans.

Recent Sales of Unregistered Securities

We did not engage in any financing transaction involving sales of unregistered shares during the year ended December 31, 2021.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

We did not repurchase any of our equity securities during the year ended December 31, 2021.

Item 6. [Reserved]

Item 7. 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 audited 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. 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.

"Arcadia Biosciences," "GoodWheat," "GoodHemp," "Zola coconut water," "Soul Spring," "ProVault" and "Saavy Naturals" are our registered trademarks in the United States and, in some cases, in certain other countries. This report may also contain trademarks, service marks, and trade names of other companies. Solely for convenience, the trademarks, service marks and trade names referred to in this report may appear without the ®, TM, or SM symbols, but such references do not constitute a waiver of any rights that might be associated with the respective trademarks, service marks, or trade names.

Overview

We are a producer and marketer of innovative, plant-based health and wellness products. Our history as a leader in science-based approaches to developing high value crop improvements, primarily in wheat, designed to enhance farm economics by improving the performance of crops in the field, as well as their value as food ingredients, health and wellness products, and their viability for industrial applications, has laid the foundation for our path forward. We have used non-GMO advanced breeding techniques to develop these proprietary innovations which we are now commercializing through the sales of seed and grain, food ingredients and products, hemp extracts, trait licensing and royalty agreements. The recent acquisition of the assets of Lief, EKO, and Zola, adds bath and body care products, CBD consumer products, as well as coconut water, to our portfolio of products.

Our commercial strategy is to satisfy consumer 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. The acquisition of the Lief, EKO and Zola brands allows us to broaden our reach within the health and wellness sector.

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

Components of Our Statements of Operations Data

Revenues

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

Product Revenues

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

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 license agreements. Revenue generated from up-front license fees are 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 represent 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).

Operating Expenses

Cost of Product Revenues

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

Research and Development Expenses

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

Gain on sale of Verdeca

The gain on sale of Verdeca is the gain recognized for the sale our membership interests in the Verdeca joint venture to our partner Bioceres. See Note 11.

Loss on sale of Arcadia Spain

The loss on sale of Arcadia Spain is the loss recognized for the sale of the assets of our subsidiary Arcadia Spain. See Note 1.

Impairment of intangible assets

Impairments of intangible assets are recorded when the fair value of intangible assets drops below its carrying amount. See Note 2 and 9.

Impairment of goodwill

Impairments of goodwill are recorded when the fair value of the reporting unit drops below its carrying amount. See Note 2.

Change in fair value of contingent consideration

Change in the fair value of contingent consideration is comprised of the fair value remeasurement of the liabilities associated with our contingent consideration.

Impairment of property and equipment, net

Impairment of property and equipment, net includes losses from tangible assets due to impairment or recoverability test charges to write down fixed assets to their fair value or recoverability value.

Interest Expense

Interest expense consists primarily of contractual interest on notes payable relating to the purchase of company vehicles.

Other Income, net

Other income, net, consists of realized gains on corporate securities, interest income and the amortization of investment premium and discount on our cash and cash equivalents and investments.

Issuance and offering costs

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

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 our financing transactions.

Gain on extinguishment of PPP loan

The PPP loan amount forgiven has been recorded as gain on extinguishment of PPP loan, as the Company has been legally released from being the primary obligor. See Note 19.

Loss on Extinguishment of Warrant Liabilities

Loss on extinguishment of warrant liability is comprised of the difference between the reacquisition price and the carrying amount of the portion of the warrants associated with the warrant exercise transactions.

Offering Costs

Offering costs generally include placement agent, legal, advisory, accounting and filing fees, allocated to the common stock warrant liabilities.

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 December 31, 2021 and 2020. 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 Years ended December 31, 2021 and 2020

	Year Ended December 31,	
	2021	2020
	(in thousands)	
Revenues:		
Product	$ 6,587	$ 1,044
License	17	6,801
Royalty	176	83
Contract research and government grants	—	106
Total revenues	6,780	8,034
Operating expenses (income):		
Cost of product revenues	8,708	5,199
Research and development	3,889	7,960
Gain on sale of Verdeca	—	(8,814)
Loss on sale of Arcadia Spain	497	—
Impairment of intangible assets	3,302	—
Impairment of goodwill	1,648	—
Change in fair value of contingent consideration	(210)	—
Impairment of property and equipment, net	1,534	—
Selling, general and administrative	22,938	16,467
Total operating expenses	42,306	20,812
Loss from operations	(35,526)	(12,778)
Interest expense	(20)	(47)
Other income, net	10,114	740
Change in fair value of common stock warrant liabilities	8,946	6,570
Loss on extinguishment of warrant liability	—	(635)
Gain on extinguishment of PPP loan	1,123	—
Offering costs	(769)	—
Net loss before income taxes	(16,132)	(6,150)
Income tax (provision) benefit	(2)	124
Net loss	(16,134)	(6,026)
Net loss attributable to non-controlling interest	(1,474)	(1,371)
Net loss attributable to common stockholders	$ (14,660)	$ (4,655)

Revenues

Product revenues accounted for 97% and 13% of our total revenues for the years ended December 31, 2021 and 2020, respectively. The $5.5 million, or 531%, increase in product revenues was primarily driven by $4.3 million of sales related to the newly acquired lines of products of Arcadia Wellness, plus higher sales of GoodWheat grain and GoodHemp seed.

License revenues accounted for 0% and 85% of our total revenues for the years ended December 31, 2021 and 2020, respectively. The $6.8 million decrease in license revenues is the result of amounts previously allocated to the licenses granted to Bioceres for certain intellectual property rights provided in connection with the November 2020 transaction. There were no license agreements executed in 2021.

Royalty revenues accounted for 3% and 1% of our total revenues for the years ended December 31, 2021 and 2020, respectively. The $93,000 increase of royalty revenues represents additional annual royalty fees earned.

Contract research and government grant revenues accounted for 0% and 1% of our total revenues for the years ended December 31, 2021 and 2020, respectively. The $106,000, or 100%, decrease in contract research and

government grant revenues was driven by the completion of agreements and grants. Given our acute focus on selling our existing products, we do not intend to continue pursuing contract research agreements and government grant projects.

Operating Expenses (Income)

Cost of Product Revenues

Cost of product revenues increased by $3.5 million, or 67%, for the year ended December 31, 2021 compared to the year ended December 31, 2020. The increase is mainly due to sales from the newly acquired lines of products within Arcadia Wellness, in addition to GoodWheat grain and GoodHemp seed sales. The increase was partially offset by $1.0 million lower inventory write-downs charged to cost of product revenues during the year ended December 31, 2021.

Research and Development

Research and development expenses decreased by $4.1 million, or 51%, for the year ended December 31, 2021 compared to the year ended December 31, 2020. The decrease was driven by the Company pivoting its focus to commercialization, which led to lower employee-related expenses as we right-sized our research teams, along with the the absence of the expenses related to Verdeca.

Gain on sale of Verdeca

The gain on sale of Verdeca decreased by $8.8 million as we sold our membership interests in the Verdeca joint venture to our partner Bioceres in 2020. See Note 11.

Loss on sale of Arcadia Spain

The loss on sale of Arcadia Spain increased by $497,000 due to the transaction executed in November 2021 in which we sold our wholly owned subsidiary to a European partner. See Note 1.

Impairment of intangible assets

We recognized an impairment of intangible assets in the amount of $3.3 million for the year ended December 31, 2021. The impairment charges were primarily the result of lower margins in our wellness products due to unfavorable product mix and higher freight costs that have a significant impact in the near-term. A volatile economic climate and higher than normal inflation were also contributing factors, in addition to a decline in the hemp seed market forecasted sales. No impairment losses were recorded in the same period of 2020. See Note 2 and 9.

Impairment of goodwill

We recognized an impairment of goodwill in the amount of $1.6 million for the year ended December 31, 2021. The impairment charge was primarily the result of weakness in our newly acquired consumer product margins, combined with a volatile economic climate and higher than normal inflation. No impairment losses were recorded in the same period of 2020. See Note 2.

Change in fair value of contingent consideration

The change in fair value of contingent consideration during the year ended December 31, 2021 was due to the Industrial Seed Innovations ("ISI") contingent consideration remeasurement that resulted in a decrease of the liability in the amount of $210,000. See Note 6 and 17. There was no change in fair value of contingent consideration during the year ended December 31, 2020.

Impairment of property and equipment, net

We recorded write-downs of fixed assets in the amount of $1.5 million for the year ended December 31, 2021. The majority of this amount was because Arcadia and Legacy mutually agreed to wind down the cultivation activities of Archipelago, due to regulatory challenges and a saturated hemp market. As a result, the Company assessed Archipelago’s fixed assets for impairment, and recorded write-downs in the amount of $1.4 million for the

year ended December 31, 2021. An additional fixed assets impairment in the amount of $100,000 was recorded for other fixed assets determined to have no future economic benefit. See Note 5. No write-downs of fixed assets were recorded in 2020.

Selling, General, and Administrative

Selling, general, and administrative expenses increased by $6.5 million, or 39%, for the year ended December 31, 2021 compared to the year ended December 31, 2020. The increase was primarily driven by selling expenses and other general and support costs related to the acquired businesses, as well as acquisition-related investment banker success fees, legal diligence and transaction fees. We have also increased commercial and marketing personnel and consulting activities in preparation for new product and channel launches.

Interest Expense

Interest expense was $20,000 for the year ended December 31, 2021, 60% lower compared to the amount recognized during the year ended December 31, 2020, due to the satisfaction of notes payable agreements during 2021. There was $47,000 of interest expense for the year ended December 31, 2020.

Other Income, Net

Other income, net, increased by $9.4 million, or 1267%, for the year ended December 31, 2021 compared to the year ended December 31, 2020. This was primarily due to the $10.2 million realized gain of corporate securities of Bioceres recorded in June 2021. See Note 6. No realized gains of corporate securities were recorded during the year ended December 31, 2020, as the prior year's other income, net balance mainly consisted of the unrealized gain of the same corporate securities in the amount of $656,000.

Gain on extinguishment of PPP loan

During the year ended December 31, 2021, we were notified by the lender that the SBA had forgiven the original PPP loan amount in full, resulting in a $1.1 million gain on the extinguishment of the PPP loan. See Note 19.

Change in the Estimated Fair Value of Common Stock Warrant Liabilities

Change in the estimated fair value of common stock warrant liabilities resulted in income of $8.9 million for the year ended December 31, 2021 due to the fair value remeasurement of the common stock warrant liabilities driven by the change in the stock price, risk-free rates and volatility as of December 31, 2021 compared to the change for the year ended December 31, 2020.

Loss on Extinguishment of Warrant Liability

In connection with the May and July 2020 Warrant Exercise Transactions, the Company recognized a loss on extinguishment of warrant liabilities of approximately $635,000 for the year ended December 31, 2020. There were no such transactions during the year ended December 31, 2021.

Issuance and offering costs

Offering costs increased by $769,000 for the year ended December 31, 2021, and were comprised of placement agent fees, placement agent warrants, and legal and accounting fees allocated to the stock warrant liabilities recorded with the January 2021 private placement financing transaction. There were no issuance and offering costs incurred during the year ended December 31, 2020.

Income Tax Provision (Benefit)

The income tax provision resulted in a $2,000 expense for the year ended December 31, 2021, compared to a benefit of $124,000 for the year ended December 31, 2020. In the prior year, purchase accounting deferred tax liabilities related to the ISI acquisition, enabled the realization of a portion of the existing deferred tax assets, thus allowing for a reduction in the valuation allowance in the amount of $107,000.

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. In the future, sales of commercial products that incorporate our seed traits will vary based on crop growing seasons and weather patterns within particular regions. Demand for our consumer body care products tends to vary with major holidays and demand for coconut water products is generally higher in the summer months.

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

Liquidity, Capital Resources and Going Concern

We have funded our operations primarily with the net proceeds from our private and public offerings of our equity securities and debt, as well as proceeds from the sale of our products and payments under license agreements, contract research agreements and government grants. Our principal use of cash is to fund our operations, which are primarily focused on commercializing our products. As of December 31, 2021, we had cash and cash equivalents of $28.7 million. For the years ended December 31, 2021 and 2020, the Company had net losses of $16.1 million and $6.0 million, respectively, and net cash used in operations of $25.9 million and $30.2 million, respectively.

We believe that our existing cash and cash equivalents will not be sufficient to meet our anticipated cash requirements for at least the next 12 months from the issuance date of our 2021 financial statements, and thus raises substantial doubt about the Company's ability to continue as a going concern. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

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

Cash Flows

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

	Year Ended December 31,	
	2021	2020
Net cash (used in) provided by:		
Operating activities	$ (25,868)	$ (30,218)
Investing activities	16,608	17,284
Financing activities	21,900	20,560
Effects of foreign currency translation on cash and cash equivalents	2	—
Net increase in cash and cash equivalents	$ 12,642	$ 7,626

Cash flows from operating activities

Cash used in operating activities for the year ended December 31, 2021 was $25.9 million. Our net loss of $16.1 million, non-cash charges including $1.5 million of stock-based compensation, $1.3 million of lease amortization, $3.6 million of write-downs of inventory, $1.5 million of impairment of property and equipment, $769,000 of issuance and offering costs, $1.6 million of impairment of goodwill, $3.3 million of impairment of

intangible assets, and $929,000 of depreciation were offset by $1.7 million adjustments in our working capital accounts, $10.2 million of realized gain on corporate securities, $8.9 million for the change in fair value of common stock warrant liabilities, $210,000 of other non-cash income from the change in fair value of contingent consideration, and $1.3 million of operating lease payments.

Cash used in operating activities for the year ended December 31, 2020 was $30.2 million. Our net loss of $6.0 million, adjustments in our working capital accounts of $11.5 million, gain on sale of Verdeca of $8.8 million, corporate securities received in exchange for license agreement of $4.3 million, change in fair value of common stock warrant liabilities of $6.6 million, operating lease payments of $910,000, unrealized gain on corporate securities of $656,000 and net amortization of investment premium of $44,000 were partially offset by non-cash charges of $2.0 million for stock-based compensation, depreciation and amortization of $662,000, lease amortization of $1.0 million, loss on extinguishment of warrant liability of $635,000, as well as $4.3 million of inventory write-downs.

Cash flows from investing activities

Cash provided by investing activities for the year ended December 31, 2021 of $16.6 million primarily consisted of $21.8 million of proceeds from sales of investments, partially offset by $4.3 million of acquisitions, and $1.0 million in purchases of property and equipment.

Cash provided by investing activities for the year ended December 31, 2020 of $17.3 million primarily consisted of $18.3 million of proceeds from sales and maturities of investments and $3.2 million of proceeds from the sale of Verdeca, partially offset by $2.3 million in purchases of property and equipment, $1.3 million of purchases of investments and $500,000 of acquisitions, net of cash acquired.

Cash flows from financing activities

Cash provided by financing activities for the year ended December 31, 2021 of $21.9 million consisted of proceeds from the issuance of common stock relating to the January 2021 private placement financing transaction of $25.1 million of gross proceeds, capital contributions from the non-controlling interest in our joint venture of $750,000, and proceeds from the purchase of ESPP shares of $39,000, which were offset by payments of transaction costs related to the January 2021 private placement of $1.9 million and principal payments on debt of $2.1 million.

Cash provided by financing activities for the year ended December 31, 2020 of $20.6 million consisted of proceeds from the exercise of warrants of $9.4 million, proceeds from the issuance of stock and warrants relating to the December 2020 Offering of $8.0 million, proceeds from borrowings of $3.1 million, capital contributions from the non-controlling interest in our joint venture of $1.6 million and proceeds from the purchase of ESPP shares of $51,000. Partially offsetting these proceeds were payments of offering costs totaling $652,000 for the December 2020 Offering, as well payments of transaction costs relating to extinguishment of warrant liability of $863,000.

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, a joint venture sold in November 2020. See Note 11.

Critical Accounting Polices 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, impairments of long-lived assets such as intangible assets and goodwill, impairment of property and equipment, and net realizable value of inventory.

Revenue recognition

We recognize revenue when control of the promised goods or services is transferred to customers at an amount that reflects the consideration to which the entity expects to be entitled to in exchange for those goods or services. See Note 2 for further detail on each of the below revenue streams.

We generally recognize product revenues once passage of title has occurred, which is generally upon delivery. Shipping and handling costs charged to customers are recorded as revenues and included in cost of product revenues at the time the sale is recognized.

We have determined that, at the inception of each license agreement, there is only one deliverable for the license for access to and assistance with the development of the specified intellectual property. We recognize revenue up-front and annual license fees in full when it is deemed probable to be earned.

We recognize royalty revenue when the Company can reasonably determine the amounts earned.

We recognize revenue related to milestone payments when it is probable that such amounts would not be reversed.

Contract research revenue consists of amounts earned from performing contracted research activities for third parties. Activities performed are related to breeding programs or the genetic engineering of plants and are subject to an executed agreement. We generally recognize fees for research activities over the contractually specified performance period.

Grant revenues are recognized as eligible research and development expenses are incurred, using a proportional performance recognition methodology.

Determination of the provision for income taxes

We use the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial reporting and the tax bases of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. A valuation allowance is provided when it is more likely than not that some portion or all of a deferred tax asset will not be realized.

Stock-based compensation

We recognize compensation expense related to the employee stock purchase plan and stock options based on the estimated fair value of the awards on the date of grant, net of estimated forfeitures. We estimate the grant date fair value, and the resulting stock-based compensation expense, using the Black-Scholes option-pricing model. The grant date fair value of the stock-based awards is generally recognized on a straight-line basis over the requisite service period, which is generally the vesting period of the respective awards.

We recorded stock-based compensation expense related to equity awards of $1.5 million and $2.0 million for the years ended December 31, 2021 and 2020, respectively.

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

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

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

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

Expected Dividend—We have never paid dividends on our common stock and have no plans to pay dividends on our common stock. Therefore, we used an expected dividend yield of zero.

For stock options and other equity awards, our board of directors determine the fair value of each share of underlying common stock based on the closing price of our common stock as reported on the NASDAQ Stock Market on the date of grant.

In addition to the Black-Scholes assumptions, we estimate our forfeiture rate based on an analysis of our actual forfeitures and will continue to evaluate the adequacy of the forfeiture rate based on actual forfeiture experience, analysis of employee turnover behavior, and other factors. The impact from any forfeiture rate adjustment would be recognized in full in the period of adjustment and if the actual number of future forfeitures differs from our estimates, we might be required to record adjustments to stock-based compensation in future periods.

Impairments of long-lived intangible assets and goodwill

The Company evaluates if events and circumstances have occurred that indicate the remaining estimated useful life of long-lived assets, such as identifiable intangible assets and goodwill, may warrant revision or that the remaining balance of these assets may not be recoverable. In evaluating for recoverability, the Company estimates the future undiscounted cash flows for intangible assets, and discounted cash flows for goodwill, expected to result from the use of the assets and their eventual disposition. In the event that the balance of any asset exceeds the future undiscounted or discounted cash flow estimate, impairment is recognized based on the excess of the carrying amounts of the asset above its estimated fair value.

Impairments of property and equipment

The Company evaluates if events and circumstances have occurred that indicate the remaining estimated useful life of property and equipment may warrant revision or that the remaining balance of these assets may not be recoverable. In evaluating for recoverability, the Company estimates the future undiscounted cash flows expected to result from the use of the assets and their eventual disposition. In the event that the balance of any asset exceeds the future undiscounted cash flow estimate, impairment is recognized based on the excess of the carrying amounts of the asset above its estimated fair value.

Net realizable value of inventories

Inventory costs are tracked on a lot-identified basis, valued at the lower of cost or net realizable value and are included as cost of product revenues when sold. We compare the cost of inventories with market value and write down inventories to net realizable value, if lower. We write down 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. Additionally, we provide reserves for excess and slow-moving inventory to its estimated net realizable value. The inventory write-downs are based upon estimates about future demand from our customers and distributors and market conditions. Future events that could significantly influence our judgment and related estimates include conditions in target markets, introduction of new products or changes to current or future competitor products.

Recent Accounting Pronouncements

For discussions of the adoption and potential impacts of recently issued accounting standards, refer to Note 3 – Recent Accounting Pronouncements.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Not applicable.

Item 8. Financial Statements and Supplementary Data.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of Arcadia Biosciences, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Arcadia Biosciences, Inc. and subsidiaries (the "Company") as of December 31, 2021 and 2020, the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows, for each of the two years in the period ended December 31, 2021, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2021, in conformity with accounting principles generally accepted in the United States of America.

Going Concern

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the consolidated financial statements, the Company has an accumulated deficit, recurring net losses and net cash used in operations, and resources that will not be sufficient to meet its anticipated cash requirements, which raises substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company’s internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by

communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

GoodWheat Inventory Valuation – Refer to Note 4 to the consolidated financial statements

Critical Audit Matter Description

GoodWheat inventories are recorded at the lower of cost or net realizable value. Management periodically evaluates the carrying value of inventories in relation to the forecasts of product demand, which takes into consideration the estimated marketability and salability of products. When quantities on hand exceed forecasted demand, regulatory changes occur, or quality specifications are not met, a write-down is recorded for such inventories. Changes in assumptions of forecasted product demand could have a significant impact on the amount of inventory valuation, and any related write-downs.

Given the significant judgments made by management in forecasting product demand, including the impact of product marketability and salability, auditing the reasonableness of management's estimates and assumptions required a high degree of auditor judgment and an increased extent of effort.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures over GoodWheat inventory valuation included the following, among others:

- We tested the demand forecasts by obtaining documentation to support customer orders, contracts, historical and future sales that corroborate the reasonableness of amount estimated for demand.
- We evaluated management's ability to accurately forecast product demand by comparing actual results to management's historical estimates.
- We performed corroborative inquiries with the personnel responsible for sales forecasting to evaluate the reasonableness of the product salability and demand forecasts.
- We assessed whether write-downs of inventory may be understated by examining write-down activity subsequent to December 31, 2021.

/s/ Deloitte & Touche LLP

Phoenix, Arizona

March 31, 2022

We have served as the Company's auditor since 2007.

Arcadia Biosciences, Inc.
Consolidated Balance Sheets
(In thousands, except share data)

	As of December 31,	
	2021	2020
Assets		
Current assets:		
Cash and cash equivalents	$ 28,685	$ 14,042
Short-term investments	—	11,625
Accounts receivable, net of allowance for doubtful accounts of $76 and $0 as of December 31, 2021 and 2020, respectively	1,370	1,406
Inventories, net — current	4,433	3,812
Prepaid expenses and other current assets	900	811
Total current assets	35,388	31,696
Restricted cash	—	2,001
Property and equipment, net	2,291	3,539
Right of use assets	3,081	5,826
Inventories, net — noncurrent	2,494	3,485
Goodwill	—	408
Intangible assets, net	484	370
Other noncurrent assets	180	23
Total assets	$ 43,918	$ 47,348
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable and accrued expenses	$ 3,638	$ 4,105
Amounts due to related parties	64	80
Debt — current	—	1,141
Unearned revenue — current	—	8
Operating lease liability — current	1,074	717
Other current liabilities	264	263
Total current liabilities	5,040	6,314
Debt — noncurrent	—	2,105
Operating lease liability — noncurrent	2,220	5,389
Common stock warrant liabilities	3,392	2,708
Other noncurrent liabilities	2,070	2,280
Total liabilities	12,722	18,796
Commitments and contingencies (Note 17)		
Stockholders' equity:		
Common stock, $0.001 par value—150,000,000 shares authorized as of December 31, 2021 and December 31, 2020; 22,184,235 and 13,450,861 shares issued and outstanding as of December 31, 2021 and December 31, 2020, respectively.	63	54
Additional paid-in capital	257,515	239,496
Accumulated deficit	(226,485)	(211,825)
Total Arcadia Biosciences stockholders' equity	31,093	27,725
Non-controlling interest	103	827
Total stockholders' equity	31,196	28,552
Total liabilities and stockholders' equity	$ 43,918	$ 47,348

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

Arcadia Biosciences, Inc.
Consolidated Statements of Operations and Comprehensive Loss
(In thousands, except share and share data)

	Year Ended December 31,	
	2021	**2020**
Revenues:		
Product	$ 6,587	$ 1,044
License	17	6,801
Royalty	176	83
Contract research and government grants	—	106
Total revenues	6,780	8,034
Operating expenses (income):		
Cost of product revenues	8,708	5,199
Research and development	3,889	7,960
Gain on sale of Verdeca	—	(8,814)
Loss on sale of Arcadia Spain	497	—
Impairment of intangible assets	3,302	—
Impairment of goodwill	1,648	—
Change in fair value of contingent consideration	(210)	—
Impairment of property and equipment, net	1,534	—
Selling, general and administrative	22,938	16,467
Total operating expenses	42,306	20,812
Loss from operations	(35,526)	(12,778)
Interest expense	(20)	(47)
Other income, net	10,114	740
Change in fair value of common stock warrant liabilities	8,946	6,570
Loss on extinguishment of warrant liability	—	(635)
Gain on extinguishment of PPP loan	1,123	—
Offering costs	(769)	—
Net loss before income taxes	(16,132)	(6,150)
Income tax (provision) benefit	(2)	124
Net loss	(16,134)	(6,026)
Net loss attributable to non-controlling interest	(1,474)	(1,371)
Net loss attributable to common stockholders	$ (14,660)	$ (4,655)
Net loss per share attributable to common stockholders:		
Basic and diluted	$ (0.69)	$ (0.47)
Weighted-average number of shares used in per share calculations:		
Basic and diluted	21,280,620	9,959,018
Other comprehensive loss, net of tax		
Unrealized losses on investment securities	—	(1)
Other comprehensive loss	—	(1)
Comprehensive loss attributable to common stockholders	$ (14,660)	$ (4,656)

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

Arcadia Biosciences, Inc.
Consolidated Statements of Stockholders' Equity
(In thousands, except share data)

	Common Stock		Additional Paid-In Capital	Accumulated Deficit	Non-controlling Interest	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2020	13,450,861	$ 54	$ 239,496	$ (211,825)	$ 827	$ 28,552
Issuance of shares related to the January 2021 PIPE	7,876,784	8	15,508	—	—	15,516
Offering costs related to the January 2021 PIPE	—	—	(2,084)	—	—	(2,084)
Issuance of placement agent warrants related to issuance of January 2021 PIPE	—	—	942	—	—	942
Issuance of shares at closing of Arcadia Wellness acquisition	827,401	1	2,052	—	—	2,053
Issuance of shares related to exercise of Service and Performance Warrants	14,000	—	22	—	—	22
Issuance of shares related to employee stock purchase plan	15,189	—	38	—	—	38
Stock-based compensation	—	—	1,541	—	—	1,541
Non-controlling interest contributions	—	—	—	—	750	750
Net loss	—	—	—	(14,660)	(1,474)	(16,134)
Balance at December 31, 2021	22,184,235	$ 63	$ 257,515	$ (226,485)	$ 103	$ 31,196

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

	Common Stock		Additional Paid-In Capital	Accumulated Deficit	Accumulated Other Comprehensive (Loss) Income	Non-controlling Interest	Total Stockholders' Equity
	Shares	Amount					
Balance at December 31, 2019	8,646,149	$ 49	$ 214,826	$ (207,171)	$ 1	$ 620	8,325
Issuance of shares related to employee stock purchase plan	19,667	—	51	—	—	—	51
Issuance of shares related to exercise of June 2018 Warrants	1,392,345	1	5,568	—	—	—	5,569
Issuance of investor warrants related to May 2020 Warrant Transaction	—	—	4,415	—	—	—	4,415
Issuance of placement agent warrants related to issuance of May 2020 Warrants	—	—	215	—	—	—	215
Issuance of shares related to the exercise of March 2018 PIPE	641,416	1	2,443	—	—	—	2,444
Issuance of investor warrants related to July 2020 Warrant Transaction	—	—	2,059	—	—	—	2,059
Issuance of placement agent warrants related to issuance of July 2020 Warrants	—	—	101	—	—	—	101
Shares of common stock issued at closing of ISI transaction	132,626	—	432	—	—	—	432
Issuance of shares and warrants related to December 2020 Offering	2,618,658	3	7,997	—	—	—	8,000
Offering costs related to December 2020 Offering	—	—	(939)	—	—	—	(939)
Issuance of placement agent warrants related to December 2020 Offering	—	—	287	—	—	—	287
Stock-based compensation	—	—	2,042	—	—	—	2,042
Non-controlling interest contributions	—	—	—	—	—	1,578	1,578
Unrealized losses on investment securities	—	—	—	—	(1)	—	(1)
Net loss	—	—	—	(4,655)	—	(1,371)	(6,026)
Balance at December 31, 2020	13,450,861	$ 54	$ 239,496	$ (211,825)	$ —	$— $ 827	$ 28,552

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

Arcadia Biosciences, Inc.
Consolidated Statements of Cash Flows
(In thousands)

	Year Ended December 31,	
	2021	**2020**
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net loss	$ (16,134)	$ (6,026)
Adjustments to reconcile net loss to cash used in operating activities:		
Change in fair value of common stock warrant liabilities	(8,946)	(6,570)
Change in fair value of contingent consideration	(210)	—
Offering costs	769	—
Depreciation	929	632
Amortization of intangible assets	116	30
Lease amortization	1,276	1,048
Impairment of intangible assets	3,302	—
Impairment of goodwill	1,648	—
Loss (Gain) on disposal of equipment	23	(8)
Loss on disposal of intangible assets	222	—
Net amortization of investment premium	—	(44)
Stock-based compensation	1,541	2,042
Bad debt expense	76	—
Gain on sale of Verdeca	—	(8,814)
Realized gain on corporate securities	(10,221)	—
Corporate securities received in exchange for license agreement	—	(4,318)
Unrealized gain on corporate securities	—	(656)
Write-down of inventory and prepaid production costs	3,593	4,311
Loss on extinguishment of warrant liability	—	635
Gain on extinguishment of PPP loan	(1,123)	—
Impairment of property and equipment	1,534	—
Deferred income taxes	—	(107)
Changes in operating assets and liabilities:		
Accounts receivable	(40)	(1,119)
Inventories	(2,383)	(9,751)
Prepaid expenses and other current assets	56	39
Other noncurrent assets	(158)	(15)
Accounts payable and accrued expenses	(372)	(580)
Amounts due to related parties	(16)	40
Unearned revenue	(8)	(34)
Other current liabilities	1	(43)
Operating lease payments	(1,343)	(910)
Net cash used in operating activities	(25,868)	(30,218)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Proceeds from sale of property and equipment	19	8
Purchases of property and equipment	(1,007)	(2,335)
Proceeds from sale of Verdeca	—	3,153
Acquisitions, net of cash acquired	(4,250)	(500)
Purchases of investments	—	(1,292)
Proceeds from sales and maturities of investments	21,846	18,250
Net cash provided by (used in) investing activities	16,608	17,284
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from issuance of common stock and warrants from December 2020 Offering	—	8,000
Payments of offering costs relating to December 2020 Offering	—	(652)
Proceeds from issuance of common stock and warrants from January 2021 PIPE securities purchase agreement	25,147	—
Payments of offering costs relating to January 2021 PIPE securities purchase agreement	(1,912)	—
Proceeds from borrowings	—	3,108
Payments of transaction costs relating to extinguishment of warrant liability	—	(863)
Principal payments on notes payable	(2,146)	(34)
Proceeds from exercise of warrants	22	9,372
Proceeds from exercise of stock options and purchases through ESPP	39	51
Capital contributions received from non-controlling interest	750	1,578
Net cash provided by financing activities	21,900	20,560
Effects of foreign currency translation on cash and cash equivalents	2	—
Net increase (decrease) in cash, cash equivalents and restricted cash	12,642	7,626
Cash, cash equivalents and restricted cash — beginning of period	16,043	8,417
Cash, cash equivalents and restricted cash — end of period	$ 28,685	$ 16,043

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

SUPPLEMENTAL DISCLOSURES OF CASH FLOW INFORMATION:		
Cash paid for interest	$ 25	$ 10
Cash paid for taxes	$ 1	$ 1
NONCASH TRANSACTIONS:		
Shares of common stock issued at closing of ISI transaction	$ —	$ 432
Common stock warrants issued to placement agent and included in offering costs related to December 2020 Purchase Agreement	—	287
Common stock warrants issued to placement agent and included in offering costs related to May 2020 Warrant Transaction	—	215
Common stock warrants issued to placement agent and included in offering costs related to July 2020 Warrant Transaction	—	101
Fair value of shares of common stock issued at closing of Arcadia Wellness transaction	2,053	—
Common stock warrants issued to placement agent and included in offering costs related to January 2021 PIPE securities purchase agreement	942	—
Right of use assets obtained in exchange for new operating lease liabilities	1,664	331
Right of use assets obtained through modification of existing lease agreement	—	4,207
Fixed assets acquired with notes payable	—	37
Purchases of fixed assets included in accounts payable and accrued expenses	—	71

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

Arcadia Biosciences, Inc.
Notes to Consolidated Financial Statements

Note 1. Description of Business

Organization

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

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

In May 2021, the Company’s wholly owned subsidiary Arcadia Wellness, LLC (“Arcadia Wellness” or “AW”, see Note 8), acquired the businesses of Eko, Lief, and Zola. The acquisition included consumer CBD brands like Soul Spring™, a CBD-infused botanical therapy brand in the natural category, Saavy Naturals™, a line of natural body care products and Provault™, a CBD-infused sports performance formula made with natural ingredients, providing effective support and recovery for athletes. Also included in the purchase is Zola, a coconut water sourced exclusively with sustainably grown coconuts from Thailand.

In April 2021, the newly formed Company’s wholly owned subsidiary Arcadia SPA, S.L. (“Arcadia Spain” or “ASPA”) acquired the physical and intellectual property assets of Agrasys S.A. (“Agrasys”), a food ingredients company based in Barcelona, Spain. The Company sold all of the assets and liabilities related to the subsidiary Arcadia Spain in November 2021 to a European buyer (the "buyer"), to focus on the US domestic market. The loss on sale of Arcadia Spain recorded on the consolidated statements of operations and comprehensive loss was $497,000. The buyer assumed all present and future liabilities, including the initial commitments related to the 2022 planting season.

In August 2019, the Company entered into a joint venture agreement with Legacy Ventures Hawaii, LLC (“Legacy,” see Note 10) to grow, extract, and sell hemp products. The partnership Archipelago Ventures Hawaii, LLC (“Archipelago”), combines the Company’s extensive genetic expertise and resources with Legacy’s experience in hemp extraction and sales. In October 2021, Arcadia and Legacy mutually agreed to wind down the cultivation activities of Archipelago, due to regulatory challenges and a saturated hemp market. As a result, the Company recorded impairments of property and equipment in the amount of $1.4 million and $0 for the years ended December 31, 2021, and 2020, respectively. The Company assessed Archipelago’s fixed assets for impairment through an asset recoverability test, using prices for similar assets. See Note 5.

Liquidity, Capital Resources, and Going Concern

The accompanying consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities during the normal course of business. Since inception, the Company has financed its operations primarily through equity and debt financings. As of December 31, 2021, the Company had an accumulated deficit of $226.5 million, and cash and cash equivalents of $28.7 million. For the years ended December 31, 2021 and 2020, the Company had net losses of $16.1 million and $6.0 million, respectively, and net cash used in operations of $25.9 million and $30.2 million, respectively. The Company believes that its existing cash and cash equivalents will not be sufficient to meet its anticipated cash requirements for at least the next 12 months from the issuance date of these financial statements, and thus raises substantial doubt about the Company’s ability to continue as a going concern. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

The Company may seek to raise additional funds through debt or equity financings. The Company may also consider entering into additional partner arrangements. The sale of additional equity would result in dilution to the Company’s stockholders. The incurrence of debt would result in debt service obligations, and the instruments governing such debt could provide for additional operating and financing covenants that would restrict operations. If

the Company does require additional funds and is unable to secure adequate additional funding at terms agreeable to the Company, the Company may be forced to reduce spending, extend payment terms with suppliers, liquidate assets, or suspend or curtail planned development programs. Any of these actions could materially harm the business, results of operations and financial condition.

Note 2. Summary of Significant Accounting Policies

Basis of Presentation and Principles of Consolidation

The consolidated financial statements include the accounts of the Company, Arcadia Wellness, Arcadia Spain and Archipelago. All intercompany balances and transactions have been eliminated in consolidation. The Company prepares its consolidated financial statements in conformity with accounting principles generally accepted in the United States of America, or U.S. GAAP (“GAAP”), and with the rules of the Securities and Exchange Commission.

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

For all periods presented, the Company has determined that it is the primary beneficiary of Archipelago, a joint venture, as it has a controlling interest in Archipelago. Accordingly, the Company consolidates Archipelago in the 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 $1,474,000 and $1,371,000 is recorded as an adjustment to net loss to arrive at net loss attributable to common stockholders for the years ended December 31, 2021 and 2020, respectively. The non-controlling partner’s equity interests are presented as non-controlling interests on the consolidated balance sheets as of December 31, 2021 and 2020.

The functional currency of the foreign subsidiary Arcadia Spain during the year ended December 31, 2021, was its local currency (i.e., the Euro). Accordingly, period-end exchange rates were applied to translate its assets and liabilities and average transaction exchange rates to translate its revenues, expenses, gains, and losses into U.S. dollars. Upon disposal of all of the assets and liabilities related to Arcadia Spain, the Company deconsolidated the accounts of the subsidiary as of November 30, 2021, and recorded a loss on the sale in the amount of $497,000 during the quarter ended December 31, 2021.

Use of Estimates

The preparation of consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions in the Company’s consolidated financial statements and notes thereto. Significant estimates and assumptions made by management included the determination of the provision for income taxes, stock-based compensation, impairments of long-lived assets such as intangible assets and goodwill, impairment of property and equipment, and net realizable value of inventory. Management bases its estimates on historical experience and on various other market-specific and relevant assumptions that management believes to be reasonable under the circumstances. Actual results could differ from those estimates.

Cash and cash equivalents

The Company considers any liquid investment with a stated maturity of three months or less at the date of purchase to be a cash equivalent. Cash and cash equivalents consist of cash on deposit with banks, and money-market funds. The Company limits cash investments to financial institutions with high credit standings; therefore, management believes that there is no significant exposure to any credit risk in the Company’s cash and cash equivalents. However, as of December 31, 2021 and 2020, a substantial portion of the Company’s cash in depository accounts is in excess of the federal deposit insurance limits.

Restricted cash

Restricted cash consists of funds that are contractually or legally restricted as to usage or withdrawal and have been presented separately from cash and cash equivalents on the consolidated balance sheets.

Investments in debt and equity securities

Investments in debt and equity securities are carried at fair value and classified as short-term investments. Realized and unrealized gains and losses on investment securities are included in other income, net, in the consolidated statements of operations and comprehensive loss. Investment securities are reported as cash and cash equivalent, short-term investments or long-term investments in the consolidated balance sheets based on the nature of the investments and maturity period. Short-term investments have maturities of less than a year and long-term investments have maturities of a year and greater from the balance sheet date.

Other-than-temporary impairments on investments

The Company regularly reviews each of its investments for impairment by determining if the investment has sustained an other-than-temporary decline in its value, in which case the investment is written down to its fair value by a charge to earnings. Factors that are considered by the Company in determining whether an other-than-temporary decline in value has occurred include (i) the market value of the investment in relation to its cost basis, (ii) the financial condition of the investment, and (iii) the Company's intent and ability to retain the investment for a sufficient period of time to allow for recovery of the market value of the investment. As of December 31, 2021, the Company had no short-term investments, and as of December 31, 2020, there was no impairment of the Company's investments.

Accounts receivable

Accounts receivable represents amounts owed to the Company from product sales, licenses, and royalties. The carrying value of the Company's receivables represents estimated net realizable values. The Company generally does not require collateral and estimates any required allowance for doubtful accounts based on historical collection trends, the age of outstanding receivables, and existing economic conditions. If events or changes in circumstances indicate that specific receivable balances may be impaired, further consideration is given to the collectability of those balances and the allowance is recorded accordingly. Past-due receivable balances are written off when the Company's internal collection efforts have been unsuccessful in collecting the amounts due. The Company had $76,000 and $0 amounts reserved for doubtful accounts at December 31, 2021 and 2020, respectively, and the allowance activity during the year ended December 31, 2021, was immaterial.

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.

GoodWheat: Proprietary wheat plants are grown, producing seed and grain with a variety of improved nutritional qualities, including high levels of amylose, improved shelf-life, and reduced gluten. The seed is used for subsequent plantings and the grain is either sold or used as an ingredient in the production of food products, which the Company refers to collectively as GoodWheat products. Amounts inventoried consist primarily of fees paid to contracted cooperators to grow the crops, costs to process harvested seed and grain, and costs to mill the grain into flour.

Body care: A portfolio of CBD-infused and CBD-free consumer bath and body care products such as body lotions, bath-bombs and topical pain relievers, that are produced in the US. Amounts inventoried consist primarily of purchased raw materials, components, labor, and manufacturing facility costs.

Zola Coconut water: Inventories mainly consist of coconut water imported from Thailand, freight-in, supplies, and labor.

GoodHemp: Proprietary seeds are grown and used for subsequent plantings and sold as final product to other growers. Amounts in inventory for internally produced hemp seeds consist primarily of labor, supplies and facility costs. The costs to procure seeds from external growers and suppliers are included in inventory, as well. In addition, hemp seeds were planted on land leased in Hawaii. The costs of purchasing, planting and growing the seed, and harvesting the resulting biomass are captured as inventory, along with the costs to process the biomass into CBD oil. Amounts in inventory for growing biomass primarily consist of labor, supplies and facility costs.

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 the cost of GoodWheat seed and grain, body care products, Zola Coconut water, and hemp seed. The inventories—noncurrent line item on the balance sheet 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 GoodWheat seed and grain, and GoodHemp seed.

Raw materials inventories consist primarily of the costs to produce body care products and GoodWheat seeds. Goods in process inventories consist of costs to produce GoodHemp seed, hemp seed production costs incurred by Archipelago, and GoodWheat seed and grain. Finished goods inventories consist of GoodWheat and body care products, and GoodHemp seeds that are available for sale.

Property and equipment

Property and equipment acquisitions are recorded at cost. Provisions for depreciation are calculated using the straight-line method over the following average estimated useful lives of the assets:

	Years
Laboratory equipment	5
Software and computer equipment	3
Machinery and equipment	2-20
Furniture and fixtures	7
Vehicles	5
Leasehold improvements	2-10 *

** Leasehold improvements are depreciated over the shorter of the estimated life of the asset or the remaining life of the lease.*

The Company evaluates if events and circumstances have occurred that indicate the remaining estimated useful life of fixed assets may warrant revision or that the remaining balance of these assets may not be recoverable. In evaluating for recoverability, the Company estimates the future undiscounted cash flows expected to result from the use of the assets and their eventual disposition. In the event that the balance of any asset exceeds the future undiscounted cash flow estimate, impairment is recognized based on the excess of the carrying amounts of the asset above its estimated fair value.

Impairment of long-lived intangible assets and goodwill

The Company evaluates if events and circumstances have occurred that indicate the remaining estimated useful life of long-lived assets and identifiable intangible assets may warrant revision or that the remaining balance of these assets may not be recoverable. In evaluating for recoverability, the Company estimates the future undiscounted cash flows expected to result from the use of the assets and their eventual disposition. In the event that the balance of any asset exceeds the future undiscounted cash flow estimate, impairment is recognized based on the excess of the carrying amounts of the asset above its estimated fair value.

Intangible assets, net

As of December 31, 2021 and 2020, there were $3.3 million and $0, respectively of impairment of intangible assets, recorded on the consolidated statements of operations and comprehensive loss. See Note 9 for more information.

Goodwill

During the year ended December 31, 2021, the Company recorded an impairment charge of $1.6 million, which was included as impairment of goodwill on our consolidated statements of operations and comprehensive loss. The goodwill carrying value of $1.6 million was fully impaired. See Note 7 and 8 for the goodwill recorded at the time of the ISI and AW acquisitions, respectively. The impairment charge was primarily the result of weakness in our newly acquired consumer product margins combined with a volatile economic climate and higher than normal inflation. The decline in the stock price observed during the fourth quarter of 2021, pushed our market capitalization significantly below the recorded value of our stockholders' equity. No goodwill impairment charges were recorded during the year ended December 31, 2020.

Fair value of financial instruments

Fair value accounting is applied for all financial assets and liabilities and non-financial assets and liabilities that are recognized or disclosed at fair value in the consolidated financial statements on a recurring basis. Assets and liabilities recorded at fair value in the 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 carrying values of the Company’s financial instruments, including cash equivalents, accounts receivable, and accounts payable approximated their fair values due to the short period of time to maturity or repayment.

Concentration of risk

Cash and cash equivalents are maintained with several financial institutions. Deposits held with banks may exceed the amount of insurance provided on such deposits. Generally, these deposits may be redeemed upon demand and are maintained with financial institutions with reputable credit and therefore bear minimal credit risk. The Company seeks to mitigate its credit risks by spreading such risks across multiple counterparties and monitoring the risk profiles of these counterparties.

Customer concentration

Significant customers are those that represent greater than 10% of the Company’s total revenues or gross accounts receivable balance at each respective balance sheet date.

Customers representing greater than 10% of accounts receivable were as follows (in percentages):

	As of December 31,	
	2021	2020
Customer B	11	21
Customer D	15	—
Customer C	—	12
Customer E	11	—
Customer A	—	57

Customers representing greater than 10% of total revenues were as follows (in percentages):

	For Year Ended December 31,	
	2021	2020
Customer D	11	—
Customer B	10	7
Customer A	—	83

Stock-based compensation

The Company recognizes compensation expense related to its employee stock purchase plan and the cost of stock-based compensation awards on a straight-line basis over the requisite service period, net of estimated forfeitures. Judgment is required in estimating the amount of stock-based awards that will be forfeited prior to vesting. Compensation expense could be revised in subsequent periods if actual forfeitures differ from those estimates. The Company has selected the Black-Scholes option-pricing model and various inputs to estimate the fair value of its stock-based awards. See Note 16 for additional information. Amounts recognized in the consolidated statements of operations and comprehensive loss were as follows (in thousands):

	Year Ended December 31,	
	2021	2020
	(in thousands)	
Research and development	$ 98	$ 341
Selling, general and administrative	1,443	1,701
Total stock-based compensation	$ 1,541	$ 2,042

Income taxes

The Company uses the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial reporting and the tax basis of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. A valuation allowance is provided when it is more likely than not that some portion or all of a deferred tax asset will not be realized.

Net loss per share

Basic net loss per share, which excludes dilution, is computed by dividing the net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period. Diluted net loss per share reflects the potential dilution that could occur if securities or other contracts to issue common stock, such as stock options, convertible promissory notes, convertible preferred stock, redeemable convertible preferred stock and warrants, result in the issuance of common stock which share in the losses of the Company. Certain potential shares of common stock have been excluded from the computation of diluted net loss per share as their effect would be anti-dilutive. Such potentially dilutive shares are excluded when the effect would be to reduce the loss per share. Due to net losses, there is no impact on earnings per share calculation in applying the two-class method since the participating securities have no legal requirement to share in any losses.

Revenue recognition

The Company derives its revenues from product sales, licensing agreements, royalty fees, contract research agreements, and government grants.

Product revenues

Product revenues to date have consisted primarily of sales of SONOVA GLA products, GoodWheat grain sales, body care products, Zola Coconut water, and GoodHemp seed sales. The Company recognizes revenue from product sales when ownership of the product is transferred to third-party distributors and consumers, collectively “our customers”, which generally occurs upon delivery. Shipping and handling costs charged to customers are

recorded as revenues and included in cost of product revenues at the time the sale is recognized. Revenues fluctuate depending on the timing of shipments of product to our customers.

License revenues

License revenues to date consist of up-front, nonrefundable license fees, annual license fees, and subsequent milestone payments that the Company receives under the Company's research and license agreements. The Company recognizes revenue generated from up-front, nonrefundable license fees upon execution of the agreement and recognizes 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 is probable to determine the timing of revenue recognition for milestone fees. Milestones typically consist of significant stages of development for the Company's 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 the Company's traits. Given the seasonality of agriculture and time required to progress from one milestone to the next, achievement of milestones is inherently uneven, and the Company's license revenues are likely to fluctuate significantly from period to period.

Royalty revenues

Royalty revenues from the Company's agreements with third parties are recognized when the Company can reasonably determine the amounts earned. In most cases, this will be upon notification from the third-party licensee.

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 and government grants revenues are 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). The Company receives payments from government entities in the form of government grants. The Company's obligation with respect to these government agreements is to perform the research on a best-efforts basis.

Unearned revenue

The Company defers revenue to the extent that cash received in conjunction with a license agreement, contract or grant exceeds the revenue recognized in accordance with Company policies. During the year ended December 31, 2021, the Company recognized revenue of $8,000 that was included in unearned revenue on the consolidated balance sheet as of December 31, 2020.

Cost of product revenues

Cost of product revenues relates to the sale of GoodWheat, Zola Coconut water, body care, GLA oil and GoodHemp products and consists of manufacturing costs, including production overhead costs such as depreciation, rent and others, in-licensing and royalty fees, any adjustments or write-downs to inventory, as well as the cost of raw materials, including inventory and third-party services costs related to procuring, processing, formulating, packaging, and shipping the Company's products.

Research and development expenses

Research and development expenses consist of costs incurred in the discovery, development, and testing of the Company's products and products in development incorporating the Company's 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.

Change in fair value of contingent consideration

Change in the fair value of contingent consideration is comprised of the gain associated with the reduction of the contingent liability. See Note 17.

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 liability classified common stock warrants. See Note 15.

Note 3. 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 consolidated financial statements.

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 adopted ASU No. 2019-12 on January 1, 2021 with an immaterial impact on the Company's disclosures.

In August 2020, the FASB issued ASU No. 2020-06, *Debt—Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging— Contracts in Entity's Own Equity (Subtopic 815-40)*. The FASB Board is issuing this Update to address issues identified as a result of the complexity associated with applying GAAP for certain financial instruments with characteristics of liabilities and equity. In addressing the complexity, the FASB Board focused on amending the guidance on convertible instruments and the guidance on the derivatives scope exception for contracts in an entity's own equity. ASU 2020-06 is effective for public business entities that meet the definition of a Securities and Exchange Commission (SEC) filer, excluding entities eligible to be smaller reporting companies as defined by the SEC, for fiscal years beginning after December 15, 2021, including interim periods within those fiscal years. The amendments in this Update are effective for public business entities that meet the definition of a smaller reporting company, as defined by the SEC, for fiscal years beginning after December 15, 2023, including interim periods within those fiscal years. The Company early adopted ASU No. 2020-06 on January 1, 2022, using the modified retrospective method. The main impact on the consolidated financial statements that will be prepared on Form 10-Q as of March 31, 2022, will be the reclassification of the Company's stock warrant liabilities to equity on the consolidated balance sheets, and the elimination of quarterly changes in the fair value of our stock warrant liabilities on the consolidated statement of operations and comprehensive loss.

In May 2021, the FASB issued ASU No. 2021-04, *Earnings Per Share (Topic 260), Debt—Modifications and Extinguishments (Subtopic 470-50), Compensation—Stock Compensation (Topic 718), and Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40): Issuer's Accounting for Certain Modifications or Exchanges of Freestanding Equity-Classified Written Call Options.* The amendments in this Update clarify and reduce diversity in an issuer's accounting for modifications or exchanges of freestanding equity-classified written call options (for example, warrants) that remain equity classified after modification or exchange. The amendments in this Update affect all entities that issue freestanding written call options that are classified in equity. The amendments in this Update are effective for all entities for fiscal years beginning after December 15, 2021, including interim periods within those fiscal years. The Company adopted ASU No. 2021-04 on January 1, 2022 with an immaterial impact on the Company's disclosures.

Note 4. Inventory

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

	December 31, 2021	December 31, 2020
Raw materials	$ 1,851	$ 966
Goods in process	842	1,921
Finished goods	4,234	4,410
Inventories	$ 6,927	$ 7,297

The write-downs to inventory are included in cost of product revenues and are based upon estimates about future demand from the Company's customers and distributors and market conditions. Therefore, if there are significant changes in demand and market conditions, substantial future write-downs of inventory may be required, which would materially increase our expenses in the period the write down is taken and materially affect our operating results. The Company recorded write-downs of wheat inventories, hemp seed inventories, and body care products of $3.6 million for the year ended December 31, 2021. The Company recorded $4.3 million of inventory write-downs for the year ended December 31, 2020.

Note 5. Property and Equipment, Net

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

	As of December 31,	
	2021	2020
Laboratory equipment	$ 2,659	$ 2,951
Software and computer equipment	548	591
Machinery and equipment	1,809	2,046
Furniture and fixtures	211	181
Vehicles	417	428
Leasehold improvements	2,306	2,229
Property and equipment, gross	7,950	8,426
Less accumulated depreciation and amortization	(5,659)	(4,887)
Property and equipment, net	$ 2,291	$ 3,539

Depreciation expense was $929,000 and $632,000 for the years ended December 31, 2021 and 2020, respectively.

As of December 31, 2021 and 2020, respectively, there was $267,000 and $239,000 of construction in progress included in property and equipment that had not been placed into service and was not subject to depreciation.

The Company recorded impairments of property and equipment in the amount of $1.5 million and $0 for the years ended December 31, 2021, and 2020, respectively. The majority was related to the fact that Arcadia and Legacy mutually agreed to wind down the cultivation activities of Archipelago, due to regulatory challenges and a saturated hemp market. As a result, the Company assessed Archipelago's fixed assets for impairment through an asset recoverability test, and recorded write-downs in the amount of $1.4 million for the year ended December 31, 2021, calculating the fair value using prices for similar assets. An additional fixed assets impairment in the amount of $100,000 was recorded as of December 31, 2021, for other fixed assets, not related to Archipelago, determined to have no future economic benefit.

Note 6. Investments and Fair Value Instruments

Investments

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

The Company classified its investments in corporate securities of Bioceres Crop Solutions Corp. ("BIOX") as short-term investments. The Company recorded realized gains of $10.2 million for the year ended December 31, 2021, associated with the sale of these corporate securities in other income, net, in the consolidated statements of operations and comprehensive loss.

The following tables summarize the amortized cost and fair value of the investment securities portfolio at December 30, 2021 and December 31, 2020.

(Dollars in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value
December 31, 2021				
Cash equivalents:				
Money market funds	$ 26,842	$ —	$ —	$ 26,842
Total Assets at Fair Value	$ 26,842	$ —	$ —	$ 26,842

(Dollars in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value
December 31, 2020				
Cash equivalents:				
Money market funds	$ 12,082	$ —	$ —	$ 12,082
Short-term investments:				
Corporate securities	10,969	656	—	11,625
Total Assets at Fair Value	$ 23,051	$ 656	$ —	$ 23,707

The Company did not have any investment categories that were in a continuous unrealized loss position for more than twelve months as of December 31, 2021.

Fair Value Measurement

The fair value of the investment securities at December 31, 2021 were as follows:

	Fair Value Measurements at December 31, 2021			
(Dollars in thousands)	Level 1	Level 2	Level 3	Total
Assets at Fair Value				
Cash equivalents:				
Money market funds	$ 26,842	$ —	$ —	$ 26,842
Total Assets at Fair Value	$ 26,842	$ —	$ —	$ 26,842

The fair value of the investment securities at December 31, 2020 were as follows:

	Fair Value Measurements at December 31, 2020			
(Dollars in thousands)	Level 1	Level 2	Level 3	Total
Assets at Fair Value				
Cash equivalents:				
Money market funds	$ 12,082	$ —	$ —	$ 12,082
Short-term investments:				
Corporate securities	11,625	—	—	11,625
Total Assets at Fair Value	$ 23,707	$ —	$ —	$ 23,707

Arcadia Biosciences, Inc.
Notes to Consolidated Financial Statements. (Continued)

The Company uses the market approach technique to value its financial instruments and there were no changes in valuation techniques during 2021 or 2020. The Company's financial instruments consist primarily of cash and cash equivalents, accounts receivable, 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 December 31, 2021 and December 31, 2020 were considered representative of their fair values due to their short term to maturity or repayment. Cash equivalents are carried at cost, which approximates their fair value.

The Company's Level 3 liabilities consist of a contingent liability resulting from the Anawah acquisition, as described in Note 17, a contingent liability resulting from the Industrial Seed Innovations ("ISI") acquisition, as described in Note 7 and 17, and common stock warrant liabilities related to the March 2018, the June 2019, the September 2019, and the January 2021 Offerings described in Note 15.

The contingent liability related to the Anawah acquisition was measured and recorded on a recurring basis as of December 31, 2021 and December 31, 2020, using unobservable inputs, namely the Company's ability and intent to pursue certain specific products developed using technology acquired in the purchase. A significant deviation in the Company's ability and/or intent to pursue the technology acquired in the purchase could result in a significantly lower (higher) fair value measurement. The contingent liability related to the ISI acquisition was measured and recorded on a recurring basis as of December 31, 2021 and December 31, 2020, using unobservable inputs, namely ISI's forecasted revenue. A significant deviation in ISI's forecasted revenue could result in a significantly lower (higher) fair value measurement.

The warrant liabilities were measured and recorded on a recurring basis using the Black-Scholes Model with the following assumptions at December 31, 2021 and 2020:

	January 2021 Warrants		September 2019 Warrants		June 2019 Warrants		March 2018 Warrants	
	December 31, 2021	December 31, 2020	December 31, 2021	December 31, 2020	December 31, 2021	December 31, 2020	December 31, 2021	December 31, 2020
Expected term (in years)	4.58	—	3.20	4.20	2.96	3.96	1.22	2.22
Expected volatility	129.8 %	—	109.7 %	135.0 %	110.8 %	135.0 %	86.0 %	130.0 %
Risk-free interest rate	1.2 %	—	0.9 %	0.3 %	0.8 %	0.3 %	0.5 %	0.1 %
Expected dividend yield	0 %	—	0 %	0 %	0 %	0 %	0 %	0 %

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

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

(Dollars in thousands)	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	Common Stock Warrant Liability - January 2021 Offering	Contingent Liabilities	Total
Balance as of December 31, 2019	$ 4,579	$ 5,444	$ 1,993	$ 2,920	$ —	$ 2,000	$ 16,936
Change in fair value and other adjustments	(2,277)	(1,426)	(1,161)	(1,706)	—	—	$ (6,570)
Exercise of warrants	(1,641)	(4,018)	—	—	—	—	$ (5,659)
ISI acquisition contingent consideration	—	—	—	—	—	280	$ 280
Balance as of December 31, 2020	$ 661	$ —	$ 832	$ 1,214	$ —	$ 2,280	$ 4,987
Initial recognition	—	—	—	—	$ 9,631	—	$ 9,631
Change in fair value and other adjustments	(654)	—	(662)	(991)	(6,638)	(210)	$ (9,155)
Balance as of December 31, 2021	$ 7	$ —	$ 170	$ 223	$ 2,993	$ 2,070	$ 5,463

Arcadia Biosciences, Inc.
Notes to Consolidated Financial Statements. (Continued)

Note 7. Industrial Seed Innovations Acquisition

In August 2020, the Company acquired by merger Industrial Seed Innovations ("ISI"), an Oregon-based industrial hemp breeding and seed company. As a result of the acquisition, the Company acquired ISI's commercial and genetic assets, including seed varieties, germplasm library and intellectual property. ISI's Rogue, Umpqua and Santiam seed varieties are now part of Arcadia's portfolio, alongside the Company's GoodHemp line of hemp seeds.

The acquisition was recorded as a business combination, in accordance with ASC Topic 805. The purchase price consideration for the acquisition totaled an estimated $1,212,000, of which $500,000 in cash and $432,000, in the form of 132,626 shares of the Company's common stock, was paid during the month of August 2020. The remaining amount of $280,000 was eligible to be recognized in two annual installments, each of up to 132,626 shares of the Company's common stock, subject to the achievement of revenue milestones in 2021 and 2022, and is recorded as a contingent liability at fair value in the consolidated balance sheets as of December 31, 2021. A change in fair value of contingent consideration of $210,000 was recognized for the year ended December 31, 2021 as the annual revenue milestone was not met for this year. The cash consideration paid for the acquisition was funded by cash on hand.

Acquisition costs are not included as components of consideration transferred and instead are accounted for as expenses in the period in which the costs are incurred. The Company incurred costs related to the ISI acquisition of approximately $67,000 included in selling, general and administrative expenses in the Company's condensed consolidated statements of operations and comprehensive loss for the year ended December 31, 2020.

The pro forma impact of the acquisition to the historical financial results was determined not to be significant.

The following table presents the allocation of the purchase price of ISI assets acquired, based on their fair values.

	Purchase Price Allocation
Inventory	$ 511
Intangible assets, net	400
Goodwill	408
Deferred tax liability	(107)
Total consideration allocated	$ 1,212

A deferred tax liability arising from the difference between book purchase price allocation and tax basis has been assessed in the amount of $107,000. Deferred tax liabilities are required to be recorded in purchase accounting independently of whether the acquiror has a valuation allowance on its own net deferred tax assets. As a result, the combined entity now has additional deferred tax liabilities available to reduce the amount of valuation allowance necessary. Future reversals of existing taxable temporary differences are an objective source of future taxable income. Accordingly, the purchase accounting deferred tax liabilities enabled the realization of a portion of the existing deferred tax assets, thus allowing for a reduction in the valuation allowance. The reduction in the valuation allowance is not accounted for as part of the purchase accounting but is recognized in the consolidated statements of operations and comprehensive loss as a discrete tax benefit in the income tax provision.

The former shareholders of ISI remain responsible for ISI's pre-acquisition liabilities. Pursuant to the acquisition agreement, the Company entered into a lease agreement with ISI for the use of land, equipment, greenhouses and buildings. The lease was effective upon the execution of the definitive acquisition agreement and had a term of 3 years with the option to renew for three additional 3-year terms. The lease was terminated effective December 31, 2021, as no further hemp seed production is deemed necessary as the inventory balance on hand is deemed sufficient.

Note 8. Arcadia Wellness Acquisition

On May 17, 2021, the Company's wholly owned subsidiary Arcadia Wellness, acquired the assets of Eko, Lief, and Zola. The acquisition included consumer brands of bath and body care products such as Soul Spring, the CBD-infused botanical therapy brand, Saavy Naturals, a line of natural body care products and Provault, a

CBD-infused sports performance formula. Also included in the purchase was Zola, a coconut water sourced from Thailand.

The acquisition was recorded as a business combination, in accordance with ASC Topic 805. The purchase price consideration for the acquisition totaled an estimated $6.1 million, of which $4.0 million in cash and $2.1 million in the form of 827,401 shares of the Company's common stock, was paid during the month of May 2021. The cash consideration paid for the acquisition was funded by cash on hand.

Acquisition costs are not included as components of consideration transferred and instead are accounted for as expenses in the period in which the costs are incurred. The Company incurred costs related to the Arcadia Wellness acquisition of approximately $850,000 included in selling, general and administrative expenses in the Company's consolidated statements of operations and comprehensive loss for the year ended December 31, 2021.

The Company performed a preliminary allocation of purchase price as of the acquisition date based on management's estimates of fair value. The Company believes its estimates and assumptions are reasonable; however, the initial estimated purchase price allocation is subject to change as the Company finalizes its determination relating to the valuation of the assets acquired, finalization of key assumptions, approaches and judgments with respect to intangible assets acquired. Accordingly, future adjustments may impact the initial estimated amount of goodwill and other allocated amounts represented in the table below. The final determination of the fair value of the assets acquired will be completed as soon as the necessary information is available, but no later than one year from the acquisition date.

The following table presents the allocation of the purchase price of the assets acquired, based on their fair values at December 31, 2021.

	Purchase Price Allocation
Inventory	$ 840
Prepaid and other current assets	62
Fixed assets	308
Deposits	82
Customer list	360
Trade names and trademarks	2,900
Formulations	260
Goodwill	1,240
Total consideration allocated	$ 6,052

The former shareholders of Eko, Lief, and Zola remain responsible for their pre-acquisition liabilities. In connection with the acquisition, the Company entered into a lease agreement for the use of offices, production equipment acquired, and storage warehouses. The lease was effective on May 17, 2021 and has a term of 3 years.

For the period from May 17 to December 31, 2021, the Company recognized approximately $4.3 million of revenue and $7.5 million of net loss relating to Arcadia Wellness, which included charges for the amortization and impairment of acquired intangible assets.

Acquired intangible assets of $3.5 million include trade names and trademarks of $2.9 million (indefinite useful life), customer list of $360,000 (fifteen-year useful life) and formulations of $260,000 (ten-year useful life).

The total weighted average amortization period for the acquired intangibles is 12.9 years.

The acquisition produced $1.2 million of goodwill. The goodwill is attributable to a combination of Arcadia Wellness's expectation regarding a more meaningful engagement by the customers due to the scale of the combined Company, and other synergies. Goodwill will be tested for impairment at least annually (more frequently if certain indicators are present). Goodwill arising from the Arcadia Wellness acquisition is not deductible for tax purposes.

Supplemental Pro-Forma Results of Operations (Unaudited)

The following unaudited pro-forma condensed consolidated results of operations for the years ended December 31, 2021 and 2020, have been prepared as if the acquisition of Arcadia Wellness had occurred on January 1, 2020 and includes adjustments for amortization of intangibles, and the addition to basic and diluted weighted average number of shares outstanding.

	For the year ended December 31,	
	2021 (Pro forma)	2020 (Pro forma)
Total revenues	$ 9,062	$ 14,684
Net loss	(17,854)	(8,152)
Net loss attributable to common stockholders	$ (16,380)	$ (6,781)
Weighted average shares - Basic and diluted	21,590,895	10,786,418
Net loss per share attributable to common stockholders:		
Basic and diluted	$ (0.76)	$ (0.63)

Note 9. Intangible assets, net

The Company's intangible assets, net as of December 31, 2021 and 2020, consist of the following:

	December 31, 2021			December 31, 2020		
	Gross Carrying Amount	Accumulated Amortization and Impairment (1)	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Amortized intangible assets						
Intellectual property	$ 570	$ 419	$ 151	$ 310	$ 27	$ 283
Customer lists	400	355	45	40	3	37
Total amortizable intangible assets	$ 970	$ 774	$ 196	$ 350	$ 30	$ 320
Indefinite-lived intangible assets						
Brands and trademarks	$ 2,950	$ 2,662	$ 288	$ 50	$ —	$ 50
Total intangible asset, net	$ 3,920	$ 3,436	$ 484	$ 400	$ 30	$ 370

(1) During the year ended December 31, 2021, the Company estimated an overall decrease in the sales forecast for AW products, due to an inventory item rationalization, in addition to a decrease in the sales forecast of ISI seeds, related to the saturated hemp seed market. As a result, Arcadia performed a quantitative intangible assets impairment test. The Company used a discounted cash flow approach to develop the fair value of our acquired intellectual property, customer lists, brands and trademarks. As a result of this assessment, Arcadia recorded an impairment of intangible assets in the amount of $3.3 million in the consolidated statements of operations and comprehensive loss for the year ended December 31, 2021.

Intellectual property and customer lists will be amortized based on their useful lives ranging between 4 and 15 years. As of December 31, 2021, future amortization of intellectual property and customer lists is as follows:

Year Ending December 31,	
2022	$ 53
2023	53
2024	53
2025	4
2026	4
Thereafter	28
Total	$ 196

Note 10. 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 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 December 31, 2021, the Company and Legacy hold 50.75% and 49.25% interests in Archipelago, respectively, and have made capital contributions to Archipelago of $3,108,000 and $3,016,000, 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 consolidated financial statements after eliminating intercompany transactions. Net loss attributable to non-controlling interest of $1,474,000 and $1,371,000 is recorded as an adjustment to net loss to arrive at net loss attributable to common stockholders for the years ended December 31, 2021 and 2020, respectively. Legacy's equity interests are presented as non-controlling interests on the consolidated balance sheets. Refer to Note 2 for basis of presentation.

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

Note 11. Verdeca-BIOX Transactions

In February 2012, the Company formed Verdeca, which was equally owned with Bioceres. Verdeca was formed to develop and deregulate soybean varieties using both partners' agricultural technologies.

On November 12, 2020, the Company entered into a Master Transaction Agreement with BIOX pursuant to which (i) the Company sold all of its memberships interests it owned in Verdeca to BIOX, and (ii) the Company and BIOX entered into a license agreement for certain intellectual property rights, including rights to the Company's HB4 soybean trait and its GoodWheat portfolio of specialty wheat products in South and Central America. Prior to the transaction, Verdeca was equally owned by the Company and a wholly-owned subsidiary of BIOX.

In consideration for the sale of the membership interests in Verdeca and entering into the license agreement, on November 12, 2020, BIOX paid the Company $5,000,000 in cash and issued the Company 1,875,000 shares of BIOX common stock. BIOX also paid the Company an additional $1,000,000 for transaction expenses and fees and is obligated to pay $2,000,000 in four equal quarterly payments with the first payment commencing within thirty days of either BIOX reaching commercial plantings of at least 200,000 hectares of Haab 4 soybeans ("HB4") or China approving the HB4 soybean trait for "food and feed". In addition to the above payments, BIOX is also obligated to pay the Company quarterly royalty payments equal to six percent (6%) of the net revenues BIOX or its affiliates receive from HB4 soybean sales and twenty five percent (25%) of the net revenues BIOX or its affiliates receive from sales of licensed wheat products; provided that total royalty payments for HB4 soybeans shall not exceed $10,000,000. The total amount of fixed consideration agreed upon as of the date of the transaction was $16,968,750. The fixed consideration was allocated based on estimates of the stand-alone selling prices. A fixed consideration in the amount of $10,288,000, including $6,650,000 of corporate securities received, has been allocated to the sale of the membership interest in Verdeca and resulted in a gain of $8,814,000 recorded on the consolidated statements of operations and comprehensive loss for the year ended December 31, 2020. Inventory with a carrying value of $1,474,000 was derecognized in connection with the sale of the membership interest in Verdeca. A fixed consideration in the amount of $6,680,000, including $4,318,000 of corporate securities received, has been allocated to the sale of intellectual property rights and has been recorded as license revenues on the consolidated statements of operations and comprehensive loss for the year ended December 31, 2020. As of December 31, 2020, the Company had $800,000 recorded within accounts receivable on its consolidated balance sheets related to this transaction, which were collected during the year ended December 31, 2021, but no additional proceeds were received. Any future proceeds from the agreement will be allocated in the same proportion.

All of the shares of BIOX were sold in June 2021 and generated a one-time impact on liquidity in the amount of $22.2 million of gross proceeds. See Note 6.

Note 12. Accounts Payable and Accrued Expenses

Accounts payable and accrued expenses consisted of the following (in thousands):

	As of December 31,	
	2021	2020
Accounts payable - trade	$ 1,411	$ 726
Payroll and benefits	1,606	1,489
Inventory	72	965
Research and development	—	45
Royalty fees due to unrelated parties	51	276
Consulting	79	153
Rent and utilities	127	78
Audit and tax fees	72	57
Legal	58	152
Other	162	164
Total accounts payable and accrued expenses	$ 3,638	$ 4,105

Note 13. Collaborative Arrangements

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

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

Note 14. Equity Financing

Private Placements

In January 2021, the Company issued in a private placement offering (the “January 2021 Private Placement”) pursuant to a securities purchase agreement (“January 2021 Purchase Agreement”) (i) 7,876,784 shares of its common stock, and (ii) warrants to purchase up to 3,938,392 shares of common stock at an exercise price of $3.13 per share (the “January 2021 Warrants”) and raised total gross proceeds of $25.1 million. The January 2021 Warrants are exercisable at any time at the option of the holder and expire 5.5 years from the date of issuance. In connection with the January 2021 Private Placement, the Company granted to a placement agent warrants to purchase a total of 393,839 shares of Common Stock (the “January 2021 Placement Agent Warrants”) that have an
exercise price per share equal to $3.99 and a term of 5.5 years from the date of issuance.

The common stock warrants are classified as a liability within Level 3 due to a contingent cash payment feature. The Company utilized a Black Scholes Merton model on January 28, 2021 with the following assumptions: volatility of 123.8 percent, stock price of $2.88 and risk-free rate of 0.5%. The estimated fair value of the common stock warrant liability was subsequently remeasured at December 31, 2021 with the changes recorded on the Company’s consolidated statements of operations and comprehensive loss. See Note 6.

The January 2021 Placement Agent Warrants were issued for services performed by the placement agent as part of the January 2021 Private Placement and were treated as offering costs. The value of the January 2021 Placement Agent Warrants was determined to be $942,000 using the Black-Scholes Model assumptions detailed in Note 6. The Company incurred additional offering costs totaling $1.9 million that consist of direct incremental legal, advisory, accounting and filing fees relating to the January 2021 Private Placement. The offering costs, inclusive of the January 2021 Placement Agent Warrants, totaled $2.8 million and allocated to the common stock warrant liability and the common stock using their relative fair values. A total of $769,000 was allocated to the common

stock warrant liability and expensed and the remaining $2.0 million was allocated to the common stock and offset to additional paid in capital.

In March 2018, the Company issued in a private placement offering (the "March 2018 Private Placement") pursuant to a securities purchase agreement ("March 2018 Purchase Agreement") (i) 300,752 shares of its common stock and (ii) warrants to purchase up to 300,752 shares of common stock at an initial exercise price equal to $45.75 (the "March 2018 Warrants") and raised total gross proceeds of $10.0 million. The March 2018 Warrants are exercisable at any time at the option of the holder and expire five years from the date of issuance. In connection with the March 2018 Private Placement, the Company granted to a placement agent warrants to purchase a total of 15,038 shares of Common Stock (the "March 2018 Placement Agent Warrants") that have an exercise price per share equal to $41.5625 and a term of five years from the date of issuance.

The number of shares of common stock and the number and exercise price of the March 2018 Warrants issued in the March 2018 Private Placement were subject to adjustments as provided in the March 2018 Purchase Agreement. 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.

Registered Direct Offerings

On May 11, 2018, the Company filed a shelf Registration Statement on Form S-3 with the SEC which was declared effective on June 8, 2018 ("Shelf Registration Statement"). This shelf registration process allows the Company to sell any combination of common stock, preferred stock, warrants and units consisting of such securities in one or more offerings from time to time having aggregate offering prices of up to $50 million. This registration statement expired on its three-year anniversary, June 8, 2021.

In December 2020, the Company entered into a securities purchase agreement (the "December 2020 Purchase Agreement") pursuant to which it sold (i) 2,618,658 registered shares of its common stock pursuant to the Shelf Registration Statement and (ii) unregistered warrants to purchase 2,618,658 shares of its common stock (the "December 2020 Warrants") in a private placement, for total gross proceeds of $8.0 million (the "December 2020 Registered Direct Offering"). The December 2020 Registered Direct Offering closed on December 22, 2020. The December 2020 Warrants have an exercise price of $3.00 per share, became exercisable upon issuance and expire 5.5 years after the date of issuance. In connection with the December 2020 Registered Direct Offering, the Company granted to a placement agent warrants to purchase a total of 130,933 shares of common stock ("December 2020 Placement Agent Warrants") that have an exercise price per share equal to $3.8188 and a term of five years. See Note 15.

In September 2019, the Company entered into a securities purchase agreement (the "September 2019 Purchase Agreement") pursuant to which it sold (i) 1,318,828 registered shares of its common stock pursuant to the Shelf Registration Statement and (ii) unregistered warrants to purchase 659,414 shares of its common stock (the "September 2019 Warrants") in a private placement, for total gross proceeds of $10.0 million (the "September 2019 Registered Direct Offering"). The September 2019 Registered Direct Offering closed on September 5, 2019. The September 2019 Warrants have an exercise price of $7.52 per share, became exercisable upon issuance and expire 5.5 years after the date of issuance. In connection with the September 2019 Registered Direct Offering, the Company granted to a placement agent warrants to purchase a total of 65,942 shares of common stock ("September 2019 Placement Agent Warrants") that have an exercise price per share equal to $9.4781 and a term of five years.

In June 2019, the Company entered into a securities purchase agreement (the "June 2019 Purchase Agreement") pursuant to which it sold (i) 1,489,575 registered shares of its common stock pursuant to the Shelf Registration Statement and (ii) unregistered warrants to purchase 1,489,575 shares of its common stock (the "June 2019 Warrants") in a private placement, for total gross proceeds of $7.5 million (the "June 2019 Registered Direct Offering"). The June 2019 Registered Direct Offering closed on June 14, 2019. The June 2019 Warrants have an exercise price of $5.00 per share, became exercisable upon issuance and expire 5.5 years after the date of issuance. In connection with the June 2019 Registered Direct Offering, the Company granted to a placement agent warrants to purchase a total of 74,479 shares of common stock ("June 2019 Placement Agent Warrants") that have an exercise price per share equal to $6.2938 and a term of five years.

In June 2018, the Company entered into a securities purchase agreement (the "June 2018 Purchase Agreement") pursuant to which it sold (i) 1,392,345 registered shares of its common stock pursuant to the Shelf Registration Statement and (ii) unregistered warrants to purchase 1,392,345 shares of its common stock (the "June

2018 Warrants") in a private placement, for total gross proceeds of $14.0 million (the "June 2018 Registered Direct Offering"). The June 2018 Registered Direct Offering closed on June 14, 2018. The June 2018 Warrants have an exercise price of $9.94 per share, became exercisable upon issuance and expire 5.5 years after the date of issuance. In connection with the June 2018 Registered Direct Offering, the Company granted to a placement agent warrants to purchase a total of 69,617 shares of common stock ("June 2018 Placement Agent Warrants") that have an exercise price per share equal to $12.568 and a term of five years.

Note 15. Warrants

Common Stock Warrant transactions

In July 2020, an existing accredited investor exercised its March 2018 Warrants (the "July 2020 Warrant Exercise Transaction") to purchase up to an aggregate of 641,416 shares of the Company's common stock at a reduced exercise price of $3.975 per share for gross proceeds of $2.6 million. As consideration for the exercise of these March 2018 Warrants, the Company issued new unregistered warrants to purchase up to 641,416 shares of common stock (the "July 2020 Warrants") at an exercise price of $3.85 per share with an exercise period of 5.5 years from the date of issuance. The July 2020 Warrants were valued at $2.1 million, which was calculated using the Black-Scholes Model with the following assumptions: volatility of 126 percent, stock price of $3.73, and risk-free rate of 0.35%. In connection with the July 2020 Warrant Exercise Transaction, the Company granted to a placement agent warrants to purchase a total of 32,071 shares of common stock (the "July 2020 Placement Agent Warrants") that have an exercise price per share equal to $4.969 and a term of 5.5 years. The value of the July 2020 Placement Agent Warrants was determined to be $101,000 using the Black-Scholes Model. The Company recognized a loss on extinguishment of warrant liability in the amount of $682,000 associated with this transaction, during the quarter ended September 30, 2020.

In May 2020, several existing accredited investors exercised the June 2018 Warrants (the "May 2020 Warrant Exercise Transaction") to purchase up to an aggregate of 1,392,345 shares of the Company's common stock at a reduced exercise price of $4.90 per share for gross proceeds of $6.8 million. As consideration for the exercise of the June 2018 Warrants, the Company issued new unregistered warrants to purchase up to 1,392,345 shares of common stock (the "May 2020 Warrants") at an exercise price of $4.775 per share with an exercise period of five years from the date of issuance. The May 2020 Warrants were valued at $4.4 million, which was calculated using the Black-Scholes Model with the following assumptions: volatility of 128 percent, stock price of $3.81, and risk-free rate of 0.38%. In connection with the May 2020 Warrant Exercise Transaction, the Company granted to a placement agent warrants to purchase a total of 69,617 shares of common stock (the "May 2020 Placement Agent Warrants") that have an exercise price per share equal to $6.125 and a term of five years. The value of the May 2020 Placement Agent Warrants was determined to be $215,000 using the Black-Scholes Model. The Company recognized a gain on extinguishment of warrant liability in the amount of $47,000 associated with this transaction, during the quarter ended June 30, 2020.

Equity Classified Common Stock Warrants

In connection with professional services agreements with non-affiliated third parties, during the years ended December 31, 2021 and 2020, the Company issued service and performance warrants ("Service and Performance Warrants").

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Notes to Consolidated Financial Statements. (Continued)

As of December 31, 2021, the Company issued the following warrants to purchase shares of its common stock. These warrants are exercisable any time at the option of the holder until their expiration date.

	Issuance Date	Term	Exercise Price Per Share	Warrants Exercised during the Year Ended December 31, 2020	Warrants Outstanding at December 31, 2020	Warrants Exercised during the Year Ended December 31, 2021	Warrants Outstanding at December 31, 2021
January 2021 Placement Agent Warrants	January 2021	5.5 years	$ 3.99	—	—	—	393,839
January 2021 Service and Performance Warrants	January 2021	2 years	$ 3.08	—	—	—	7,500
December 2020 Warrants	December 2020	5.5 years	$ 3.00	—	2,618,658	—	2,618,658
December 2020 Placement Agent Warrants	December 2020	5 years	$ 3.82	—	130,933	—	130,933
July 2020 Warrants	July 2020	5.5 years	$ 3.85	—	641,416	—	641,416
July 2020 Placement Agent Warrants	July 2020	5.5 years	$ 4.97	—	32,071	—	32,071
May 2020 Warrants	May 2020	5 years	$ 4.78	—	1,392,345	—	1,392,345
May 2020 Placement Agent Warrants	May 2020	5 years	$ 6.13	—	69,617	—	69,617
March 2020 Service and Performance Warrants	March 2020	3 years	$ 2.50	—	18,350	—	18,350
February 12, 2020 Service and Performance Warrants	February 2020	2 years	$ 4.71	—	150,000	—	150,000
February 3, 2020 Service and Performance Warrants	February 2020	2 years	$ 4.91	—	10,000	—	10,000
September 2019 Placement Agent Warrants	September 2019	5 years	$ 9.48	—	65,942	—	65,942
August 2019 Service and Performance Warrants	August 2019	2 years	$ 1.92	—	20,000	(20,000)	—
July 2019 Service and Performance Warrants	July 2019	2 years	$ 2.19	—	10,000	(10,000)	—
June 2019 Placement Agent Warrants	June 2019	5 years	$ 6.29	—	74,479	—	74,479
April 2019 Service and Performance Warrants	April 2019	5 years	$ 6.18	—	145,154	—	145,154
June 2018 Placement Agent Warrants	June 2018	5 years	$ 12.57	—	69,617	—	69,617
March 2018 Placement Agent Warrants	March 2018	5 years	$ 41.56	—	15,038	—	15,038
Total				—	5,463,620	(30,000)	5,834,959

Liability Classified Common Stock Warrants

Certain warrants contain a contingent cash payment feature and therefore were accounted for as a liability at the date of issuance and are adjusted to fair value at each balance sheet date. The change in fair value of the warrant liability is recorded as change in fair value of common stock warrant liabilities in the consolidated statements of operations and comprehensive loss. The key terms and activity of the liability classified common stock warrants are summarized as follows:

	Issuance Date	Term	Exercise Price Per Share	Warrants Exercised during the Year Ended December 31, 2020	Warrants Outstanding at December 31, 2020	Warrants Exercised during the Year Ended December 31, 2021	Warrants Outstanding at December 31, 2021
January 2021 Warrants	January 2021	5.5 years	$ 3.13	—	—	—	3,938,392
September 2019 Warrants	September 2019	5.5 years	$ 7.52	—	659,414	—	659,414
June 2019 Warrants	June 2019	5.5 years	$ 5.00	—	435,830	—	435,830
June 2018 Warrants	June 2018	5.5 years	$ 9.94	1,392,345	—	—	—
March 2018 Warrants	March 2018	5 years	$ 10.73	641,416	641,416	—	641,416
Total				2,033,761	1,736,660	—	5,675,052

See Note 6 for the Black-Scholes option-pricing model and weighted-average assumptions used to estimate the fair value of the warrant liabilities.

Note 16. Stock-Based Compensation and Employee Stock Purchase Program

Stock Incentive Plans

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

In 2006, the Company adopted the 2006 Plan, which provided for the granting of stock options to executives, employees, and other service providers under terms and provisions established by the Board of Directors. The Company granted non-statutory stock options (“NSOs”) under the 2006 Plan until May 2015, when it was terminated as to future awards, although it continues to govern the terms of options that remain outstanding and were issued under the 2006 Plan. The 2015 Plan became effective upon the Company’s IPO in May 2015 and all shares that were reserved, but not issued, under the 2006 Plan were assumed by the 2015 Plan. Upon effectiveness, the 2015 Plan had 154,387 shares of common stock reserved for future issuance, which included 10,637 that were transferred to and assumed by the 2015 Plan. The 2015 Plan provides for automatic annual increases in shares available for grant. In addition, shares subject to awards under the 2006 Plan that are forfeited or canceled will be added to the 2015 Plan. The 2015 Plan provides for the grant of incentive stock options (“ISOs”), NSOs, restricted stock awards, stock units, stock appreciation rights, and other forms of equity compensation, all of which may be granted to employees, officers, non-employee directors, and consultants. The exercise price for ISOs and NSOs will be granted at a price per share not less than the fair value of our common stock at the date of grant. Options granted generally vest over a four-year period; however, the options granted in the third quarter of 2018 vest over two-year period, vesting monthly on a pro-rated basis. Options granted, once vested, are generally exercisable for up to 10 years, after grant to the extent vested.

In June 2019, the shareholders approved an amendment to the Company’s 2015 Plan for a one-time increase to the number of shares of common stock that may be issued under the 2015 Plan by 120,000 shares. On May 17, 2021, upon completion of the Arcadia Wellness transaction, the Company granted 248,000 inducement stock option pursuant to Rule 5635(c)(4) of the Nasdaq Listing Rules. On May 28, 2021, the Company filed a registration statement on Form S-8 to register the issuance of shares upon exercise of these inducement stock options. The inducement options grants have been issued outside of the 2015 Plan, but the options are subject to the terms and conditions of the 2015 Plan. As of December 31, 2021, a total of 1,596,209 shares of common stock were reserved for issuance under the 2015 Plan, of which 250,254 shares of common stock are available for future grant. As of

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December 31, 2021, a total of 8,240 and 1,345,955 options are outstanding under the 2006 and 2015 Plans, respectively. As of December 31, 2021 a total of 68,000 inducement options are outstanding.

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

	Shares Subject to Outstanding Options	Weighted-Average Exercise Price Per Share	Aggregate Intrinsic Value
Outstanding — Balance at December 31, 2019	661,701	$ 21.60	$ 305
Options granted	502,494	4.28	—
Options exercised	—	—	—
Options forfeited	(174,508)	5.91	—
Options expired	(99,928)	25.56	—
Outstanding — Balance at December 31, 2020	889,759	14.46	$ 240
Options granted	1,227,042	2.76	—
Options exercised	—	—	—
Options forfeited	(440,166)	3.09	$ 1,086
Options expired	(254,440)	29.02	—
Outstanding — Balance at December 31, 2021	1,422,195	5.28	—
Vested and expected to vest — December 31, 2021	1,322,111	5.47	—
Exercisable —December 31, 2021	743,109	$ 7.54	—

Aggregate intrinsic value represents the difference between the exercise price of the options and the estimated fair value of the Company's common stock determined by our Board of Directors for each of the respective periods. The intrinsic value of options exercisable was $0 for both years ended December 31, 2021 and 2020.

As of December 31, 2021, there was $1.1 million of unrecognized compensation cost related to unvested stock-based compensation grants that will be recognized over the weighted-average remaining recognition period of 3.00 years.

On December 14, 2021, Matt Plavan provided notice to the Company of his resignation as Arcadia's president, chief executive officer and director, effective as of December 31, 2021. On December 19, 2021, Arcadia and Mr. Plavan entered into a Separation and Release Agreement (the "Separation Agreement") which provided that the vesting of all unvested options previously issued to Mr. Plavan accelerated pursuant to the terms of the Separation Agreement. In addition, the Separation Agreement extends the post-termination exercise period of the accelerated options from 90 days to up to two and one-half years. The stock compensation expense related to the modification of Mr. Plavan's stock options was $154,000 and recognized in selling, general and administrative expenses during the year ended December 31, 2021.

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

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

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

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

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

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

	Year Ended December 31,	
Assumptions	2021	2020
Expected term (years)	6.31	6.48
Expected volatility	121%	134%
Risk-free interest rate	0.86%	1.01%
Expected dividend yield	—	—

The weighted-average, estimated grant date fair value of employee stock options granted during the years ended December 31, 2021 and 2020 was $2.41 and $3.80, respectively. The Company recognized $1.5 million and $2.0 million of compensation expense for stock options awards for the years ended December 31, 2021 and 2020, respectively.

Employee Stock Purchase Plan

The Company's 2015 Employee Stock Purchase Plan ("ESPP") became effective on May 14, 2015. The ESPP allows eligible employees to purchase shares of the Company's common stock at a discount of up to 15% of their eligible compensation through payroll deductions, subject to any plan limitations. After the first offering period, which began on May 14, 2015 and ended on February 1, 2016, the ESPP provides for six-month offering periods, and at the end of each offering period, employees are able to purchase shares at 85% of the lower of the fair market value of the Company's common stock on the first trading day of the offering period or on the last day of the offering period. As of December 31, 2021, the number of shares of common stock reserved for future issuance under the ESPP is 111,722. The ESPP provides for automatic annual increases in the shares available for purchase beginning on January 1, 2016. As of December 31, 2021, 50,245 shares had been issued under the ESPP. The Company recorded $14,000 and $47,000 of ESPP related compensation expense for the years ended December 31, 2021 and 2020, respectively.

Note 17. 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 18.

Legal Matters

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

Contingent Liability Related to the Anawah Acquisition

On June 15, 2005, the Company completed its agreement and plan of merger and reorganization with Anawah, Inc. ("Anawah"), to purchase the Anawah's food and agricultural research company through a non-cash stock purchase. Pursuant to the merger with Anawah, and in accordance with the ASC 805 - Business Combinations, the Company incurred a contingent liability not to exceed $5.0 million. This liability represents amounts to be paid to Anawah's previous stockholders for cash collected on revenue recognized by the Company upon commercial sale of certain specific products developed using technology acquired in the purchase. 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 of December 31, 2021, the Company continues to pursue a total of two development programs using this technology and believes that the contingent liability is probable. As a result, $2.0 million remains on the consolidated balance sheet as an other noncurrent liability.

Contingent Liability Related to the ISI Acquisition

In August 2020, the Company acquired by merger Industrial Seed Innovations (ISI). A portion of the purchase price consideration for the acquisition in the amount of $280,000 will be recognized in two annual installments, each of up to 132,626 shares of the Company's common stock, subject to the achievement of revenue milestones in 2021 and 2022. The contingent consideration of $280,000 was measured and recorded at fair value. As of December 31, 2021, the full amount of the contingent consideration is included in other noncurrent liabilities as no installments will become due within 12 months from the consolidated balance sheets date. During the year ended December 31, 2021 as a result of a remeasurement of the contingent consideration, a $210,000 decrease in the related liability was recorded as a change in fair value of contingent consideration on the consolidated statements of operations and comprehensive loss.

Contracts

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

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

Royalties due to both related and unrelated parties accrued as of December 31, 2021 and 2020 were $115,000 and $356,000, respectively. Accrued royalties are included within accounts payable and accrued expenses on the consolidated balance sheets.

Milestone payments are contingent upon the successful development or implementation of various technologies. Payments for milestones yet to be achieved totaled $2.0 million for both the years ended December 31, 2021 and 2020, respectively. The timing of the payments is not determinable at this time pending research and development currently in progress; however, no payments were made during the years ended December 31, 2021 and 2020.

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

Note 18. Leases

Operating Leases

As of December 31, 2021, the Company leases office space in Davis, CA, Chatsworth, CA, and Chesterfield, MO, as well as additional buildings, land and equipment. Leases with an initial term of 12 months or less are not recorded on the balance sheet; the Company recognizes lease expense for these short-term leases on a straight-line basis. The Company subleases a portion of the Davis office lease to a third party. During the year ended December 31, 2021, the Company entered into two leases for office space in Chesterfield, MO, and for office space and

production in Chatsworth, CA, both with a lease term of 35 months following the commencement date and no renewal option. The leases commenced in April and May of 2021, respectively. There are no other leases that have not yet commenced as of December 31, 2021.

Some leases (the Davis office, warehouse, greenhouses 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. During the year ended December 31, 2020, the Company entered into a lease amendment that provided for additional office space in Davis, CA, and extended the term through April 2025, with one option to renew for an additional five-year term. The Company initially expected to exercise its options to renew, and in accordance with ASC 842, *Leases*, accounted for the amendment and expected renewal as a lease modification and remeasured the operating lease liability. During the year ended December 31, 2021, the Company re-assessed its long-term strategy regarding office spaces, and determined that the expectation to exercise its option to renew for an additional five-year term after April 2025 is no longer reasonable. In accordance with ASC 842, the Company accounted for the change that resulted in a decrease of $2.8 million for the operating lease liability and of $2.6 million for the right of use asset.

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

Leases	Classification	December 31, 2021	December 31, 2020
Assets			
Operating lease assets	Right of use asset	$ 3,081	$ 5,826
Total leased assets		$ 3,081	$ 5,826
Liabilities			
Current - Operating	Operating lease liability - current	$ 1,074	$ 717
Noncurrent - Operating	Operating lease liability - noncurrent	2,220	5,389
Total leased liabilities		$ 3,294	$ 6,106

Lease Cost	Classification	For the Year Ended December 31, 2021	For the Year Ended December 31, 2020
Operating lease cost	SG&A and R&D Expenses	$ 1,352	$ 1,042
Short term lease cost [1]	SG&A and R&D Expenses	133	305
Sublease income [2]	SG&A and R&D Expenses	(63)	(45)
Net lease cost		$ 1,422	$ 1,302

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

Lease Term and Discount Rate	December 31, 2021	December 31, 2020
Weighted-average remaining lease term (years)	2.7	5.0
Weighted-average discount rate	6%	6%

The maturities of the operating lease liabilities as of December 31, 2021 are as follows (in thousands):

Years Ending December 31,	Amounts
2022	$ 1,217
2023	1,237
2024	973
2025	168
2026 and thereafter	—
Total operating lease payments	$ 3,595
Less: imputed interest	$ 301
Total current and noncurrent operating lease liabilities	$ 3,294

Note 19. Debt

No maturities of current and noncurrent debt are due as of December 31, 2021. Maturities of current and noncurrent debt as of December 31, 2020 were $1.1 million, and $2.1 million, respectively.

Vehicle Loans

The Company entered into notes payable agreements to finance the purchase of company vehicles. During the year ended December 31, 2021, the Company paid all notes payable related to company vehicles in full.

Paycheck Protection Program Note

On April 16, 2020, the Company borrowed $1.1 million through MidFirst Bank, a federally chartered savings association (the "Lender"), and entered into a promissory note for the same amount under the Paycheck Protection Program (“PPP”) that was established under the Coronavirus Aid Relief, and Economic Security Act (“CARES Act”) of 2020. During 2021, the Company applied for full PPP loan forgiveness, and in August 2021, the lender notified Arcadia that the SBA had forgiven the original loan in full. During the year ended December 31, 2021, the amount forgiven has been recorded as gain on extinguishment of PPP loan on the consolidated statements of operations and comprehensive loss, as the Company has been legally released from being the primary obligor in accordance with ASC 405-20, *Liabilities – Extinguishment of Liabilities*.

Promissory Note

On June 26, 2020, the Company executed a promissory note (the “Note") in the amount of $2.0 million, payable to MidFirst Bank, a federally chartered savings association (the "Lender"). The Note was issued in accordance with the terms of a Loan Agreement dated as of May 18, 2020 entered into by the Company and the Lender (the “Loan Agreement”) in which the Lender agreed to make advances to the Company from time to time, at any amount up to but not to exceed $2.0 million. Pursuant to the Loan Agreement, the Note accrued interest, adjusted monthly, at a rate equal to the greater of (i) 3.25% and (ii) the sum of (a) the quotient of the LIBOR Index divided by (one minus the reserve requirement set by the Federal Reserve), and (b) 2.50%. The Company was required to make monthly interest payments on the Note to the Lender and pay the full principal amount plus any accrued but unpaid interest outstanding under the Note no later than May 18, 2023. The Company and the Lender also entered into a Pledge and Security Agreement dated as of May 18, 2020 whereby the Company agreed to secure the Note by granting a security interest to the Lender for the Company’s deposit account held with and controlled by the Lender. On February 26, 2021, the Company repaid the full balance of $2.0 million, and on March 31, 2021, the line of credit was closed. As of December 31, 2021, there was no outstanding balance of the Note. Due to the lender’s control of the deposit account, a balance of $2.0 million was included in restricted cash on the consolidated balance sheets as of December 31, 2020.

Note 20. Income Taxes

The components of loss before income taxes are as follows (in thousands):

	Year Ended December 31,	
	2021	2020
Domestic	$ (16,006)	$ (6,150)
Foreign	(126)	—
Loss before income taxes	$ (16,132)	$ (6,150)

The total income tax (expense) benefit for the years ended December 31, 2021 and 2020 was $(2,000) and $124,000, respectively, and is comprised of current state taxes and foreign taxes withheld by governmental agencies outside of the United States, as follows (in thousands):

	Year Ended December 31,	
	2021	2020
Current:		
Federal	$ —	$ —
State	(2)	28
Foreign	—	(10)
Total current tax (expense) benefit	(2)	18
Deferred:		
Federal	—	84
State	—	22
Foreign	—	—
Total deferred tax (expense) benefit	—	106
Total tax (expense) benefit	$ (2)	$ 124

The Company operates in only one federal jurisdiction, the United States. The following is a reconciliation of the statutory federal income tax rate to the Company's effective tax rate is as follows:

	Year Ended December 31,	
	2021	2020
Expected income tax provision at the federal statutory rate	21.0%	21.0%
State taxes, net of federal benefits	(20.1)%	9.4%
Impact of section 382 study	(10.4)%	—
Change in valuation allowance	(0.4)%	(43.8)%
Transaction costs	(1.0)%	(2.2)%
Derivative liabilities	11.7%	22.4%
Non-Controlling Interest	(1.9)%	(4.7)%
Gain on debt extinguishment	1.5%	—
withholding taxes	—	(0.2)%
Other	(0.4)%	—
Income tax provision	—	1.9%

Arcadia Biosciences, Inc.
Notes to Consolidated Financial Statements. (Continued)

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, net operating loss carryforwards ("NOLs") and other tax credits. Significant components of the Company's deferred tax assets and liabilities are as follows (in thousands):

	As of December 31,	
	2021	2020
Deferred tax assets:		
Net operating loss carryforwards	$ 14,586	$ 15,478
Unearned revenue	1	2
Stock-based compensation	3,677	3,881
Accrued payroll and benefits	3	236
Research and development credits	16	16
Fixed asset basis difference	73	84
Inventory reserve	422	491
Charitable contributions	2	3
Income from partnerships	163	—
Lease liability	752	1,622
Contingent consideration	456	531
Allowance for bad debt	27	—
Amortized intangibles	660	—
Goodwill	366	—
Total deferred tax assets	21,204	22,344
Deferred tax liabilities:		
Right of use asset	(699)	(1,548)
Amortizable intangibles	—	(98)
Income from partnerships	—	(13)
Other	—	(174)
Total deferred tax liabilities	(699)	(1,833)
Less valuation allowance	(20,505)	(20,511)
Net deferred tax assets	$ —	$ —

Realization of the deferred tax assets is dependent upon future taxable income, if any, the amount and timing of which are uncertain. Accordingly, the net deferred tax assets have been offset by a valuation allowance. The net valuation allowance decreased by $6,000 during the year ended December 31, 2021 and increased by $1.9 million during the year ended December 31, 2020.

At December 31, 2021, the Company had federal and state NOLs aggregating approximately $64.2 million and $23.9 million, respectively. At December 31, 2021, the utilization of a portion of the federal NOLs is subject to an annual limitation under Section 382 of the Internal Revenue Code (IRC). Of the $208.1 million of federal NOLs available, approximately $144.0 million are expected to expire utilized due to ownership changes as defined in IRC Section 382. The Company is currently conducting additional analysis regarding the valuation of the Company at the time of the ownership changes to assess what, if any, portion of the $144.0 million limitation may be restored, but the NOL deferred tax asset as recorded currently reflects the full limitation. If not utilized, the federal and state NOLs will begin to expire in 2022 and 2024, respectively. IRC Section 382 may also limit NOLs generated in future years. 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. The Company's ownership shift analysis was performed through December 31, 2021.

The Company evaluates deferred tax assets, including the benefit from NOLs, to determine if a valuation allowance is required. Such evaluation is based on consideration of all available evidence using a "more likely than not" standard with significant weight being given to evidence that can be objectively verified. This assessment considers, among other matters, the nature, frequency, and severity of current and cumulative losses; forecasts of future profitability; the length of statutory carryforward periods; the Company's experience with operating losses; and tax-planning alternatives. The significant piece of objective negative evidence evaluated was the cumulative loss

incurred through the year ended December 31, 2021. Given this evidence and the expectation to incur operating losses in the foreseeable future, a full valuation allowance has been recorded against the net deferred tax asset. The Company will continue to maintain a full valuation allowance against the entire amount of its net deferred tax asset, until such time as the Company has determined that the weight of the objectively verifiable positive evidence exceeds that of the negative evidence and it is likely that the Company will be able to utilize all of its net deferred tax asset relating to its federal and state NOL carryforwards. Although the Company has established a full valuation allowance on its net deferred tax asset, for Federal tax losses before 2018 and for all state tax losses, it has not forfeited the right to carryforward tax losses up to 20 years and apply such tax losses against taxable income in such years, thereby reducing its future tax obligations. Federal tax losses generated in 2018 and later do not expire. The Company is subject to taxation in the United States and various state jurisdictions. As of December 31, 2021, the Company's tax years for 2002 through 2021 are generally subject to examination by the tax authorities. The years are open back to 2002 to the extent the NOLs being carried forward were generated then.

As of December 31, 2021, the Company had the following unrecognized tax benefits (in thousands):

	Year Ended December 31,	
	2021	2020
Unrecognized tax benefit beginning balance	$ 17	$ —
Increases for tax positions taken in prior years	—	2
Decreases for tax positions taken in prior years	—	—
Increases for tax positions taken in current years	—	15
Settlements	—	—
Unrecognized tax benefit ending balance	$ 17	$ 17

The Company is currently not under audit for federal or state purposes. The Company does not anticipate its total unrecognized tax benefits as of December 31, 2021 will significantly change due to settlement of examination or the expiration of statute of limitations during the next 12 months. The Company is currently unaware of any uncertain tax positions that could result in significant additional payments, accruals or other material deviation in this estimate over the next 12 months.

Note 21. Retirement Benefits

The Company has a 401(k) retirement plan (the "Plan") available for participation by all regular full-time employees who have completed three months of service with the Company. The Company established the Plan in 2008. The Plan provides for a discretionary matching contribution equal to 50% of the amount of the employee's salary deduction, not to exceed 3% of the salary per employee. Highly compensated employees are excluded from receiving any discretionary matching contribution. Employees' rights to employer contributions vest on the one-year anniversary of their date of employment. The Company has the option to make discretionary matching contributions. The Company did not make discretionary matching contributions during the years ended December 31, 2021 and 2020.

Note 22. Segment and Geographic Information

Management has determined that it has one business activity and operates in one segment as it only reports financial information on an aggregate and consolidated basis to its Chief Executive Officer, who is the Company's chief operating decision maker.

Revenues based on the location of the customers, are as follows (in thousands):

	Year Ended December 31,	
	2021	2020
United States	$ 6,003	$ 761
Argentina	26	6,681
India	7	100
Africa	—	106
Canada	503	354
Spain	225	—
United Kingdom	16	—
Austria	—	32
Total	$ 6,780	$ 8,034

Note 23. Net Loss per Share

Basic net loss per share is calculated by dividing net loss attributable to common stockholders by the weighted-average number of common shares outstanding during the period and excludes any dilutive effects of stock-based awards and warrants. Diluted net loss per share attributable to common stockholders is computed giving effect to all potentially dilutive common shares, including common stock issuable upon exercise of stock options and warrants. As the Company had net losses for the years ended December 31, 2021 and 2020, all potentially dilutive common shares were determined to be anti-dilutive.

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

	Year Ended December 31,	
	2021	2020
Options to purchase common stock	1,422,195	889,759
Warrants to purchase common stock	11,510,011	7,200,280
Total	12,932,206	8,090,039

Note 24. Related Party Transactions

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

Transactions with related parties are reflected in the consolidated financial statements under amounts due to related parties. Outlined below are details of agreements between the Company and its related parties:

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 $64,000 and $80,000 as of December 31, 2021 and December 31, 2020, respectively, and are included in the consolidated balance sheets as amounts due to related parties.

The Company currently leases land on the island of Molokai, Hawaii from an entity owned by Kevin Comcowich, the Chair of the Company's Board of Directors, and his wife. The Company has grown hemp on this land to support the operations of its 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. During the quarter ended March 31, 2020, the Company engaged a third-party contractor to construct a fence on the property to adhere to the rules of the hemp pilot program. 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 and April 2020, the Company entered into two lease amendments for two additional 10-acre parcels and two additional 15-acre parcels, at the same lease rate of $1,200 per acre per year, and with a term of two years. The Company made lease payments in the amount of $84,000 and $84,000 for the years ended December 31, 2021 and 2020, respectively. Mr. Comcowich served as the Company's interim chief executive officer from January 1, 2022 to February 1, 2022, and received $34,000 in total compensation for his services in this role.

Note 25. Subsequent Events

The Company has reviewed and evaluated subsequent events occurred after December 31, 2021 through the date the consolidated financial statements were available to be issued.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

As of December 31, 2021, Arcadia's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, or the Exchange Act) were evaluated, with the participation of Arcadia's principal executive officer and principal financial officer, to assess whether they are effective in providing reasonable assurance that information required to be disclosed by Arcadia in the reports that it files or submits under the Exchange Act is accumulated and communicated to management, including its principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure and to provide reasonable assurance that such information is recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission rules and forms. Based on this evaluation, Stanley E. Jacot Jr., Arcadia's principal executive officer, and Pamela Haley, Arcadia's principal financial officer, concluded that these disclosure controls and procedures were effective as of December 31, 2021.

Management's Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)). Arcadia's management, including Stanley E. Jacot Jr., its principal executive officer, and Pamela Haley, its principal financial officer, evaluated the effectiveness of Arcadia's internal control over financial reporting using the framework in Internal Control—Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, management concluded that Arcadia's internal control over financial reporting was effective as of December 31, 2021.

Changes in Internal Control over Financial Reporting

Under the supervision and with the participation of our management, including our Principal Executive Officer and Principal Financial Officer, we conducted an evaluation of any changes in our internal control over financial reporting (as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) that occurred during our most recently completed fiscal quarter. Based on that evaluation, our Principal Executive Officer and Principal Financial Officer concluded that there has not been any change in our internal control over financial reporting during that quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this item will be contained in our definitive proxy statement to be filed with the Securities and Exchange Commission on Schedule 14A in connection with our 2021 Annual Meeting of Stockholders (the "Proxy Statement"), which is expected to be filed no later than 120 days after the end of our fiscal year ended December 31, 2021, under the headings "Executive Officers," "Election of Directors," "Corporate Governance," and "Section 16(a) Beneficial Ownership Reporting Compliance," and is incorporated herein by reference.

The Company has adopted a written code of business conduct and ethics that applies to our directors, officers, and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. A current copy of the code is posted on the Corporate Governance section of our website, which is located at www.arcadiabio.com. If Arcadia makes any substantive amendments to, or grant any waivers from, the code of business conduct and ethics for our principal executive officer, principal financial officer, principal accounting officer, controller or persons performing similar functions, or any officer or director, the Company will disclose the nature of such amendment or waiver on our website or in a current report on Form 8-K.

Item 11. Executive Compensation.

The information required by this item will be contained in Proxy Statement under the headings "Executive Compensation" and "Director Compensation," and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information required by this item will be contained in Proxy Statement under the headings "Security Ownership of Certain Beneficial Owners and Management" and "Equity Compensation Plan Information," and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by this item will be contained in Proxy Statement under the headings "Certain Relationships and Related Party Transactions" and "Corporate Governance," and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

The information required by this item will be contained in Proxy Statement under the heading "Ratification of Independent Registered Public Accounting Firm-Principal Accounting Fees and Services," and is incorporated herein by reference.

Auditor Firm Id:	34	Auditor Name:	Deloitte & Touche LLP	Auditor Location:	Phoenix, AZ, United States

PART IV

Item 15. Exhibits, Financial Statement Schedules.

The financial statements schedules and exhibits filed as part of this Annual Report on Form 10-K are as follows:

(a)(1) Financial Statements

Reference is made to the financial statements included in Item 8 of Part II hereof.

(a)(2) Financial Statement Schedules

All other schedules are omitted because they are not required or the required information is included in the statements or notes thereto.

(a)(3) Exhibits

Reference is made to the Exhibit Index accompanying this Annual Report on Form 10-K.

Item 16. Form 10-K Summary.

Not applicable.

Exhibit Index

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation of Registrant.	8-K	001-37383	3.1	5/26/2015	
3.2	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Registrant.	10-Q	001-37383	3.1	8/10/2017	
3.3	Amendment to the Amended and Restated Certificate of Incorporation of Registrant.	8-K	001-37383	3.1	1/23/2018	
3.4	Amended and Restated Bylaws of Registrant.	8-K	001-37383	3.2	5/26/2015	
4.1	Form of Registrant's common stock certificate.	S-3	333-224061	4.1	3/30/2018	
4.2	Form of Common Stock Purchase Warrant.	8-K	001-37383	4.1	3/23/2018	
4.3	Form of Common Stock Purchase Warrant.	8-K	001-37383	4.1	6/14/2019	
4.4	Form of Placement Agent Warrant.	8-K	001-37383	4.2	6/14/2019	
4.5	Form of Common Stock Purchase Warrant.	8-K	001-37383	4.1	9/9/2019	
4.6	Form of Placement Agent Warrant.	8-K	001-37383	4.2	9/9/2019	

4.7	Description of Registrant's Securities Pursuant to Section 12 of the Securities Exchange Act of 1934, as amended.	10-K	001-37383	4.7	3/25/2020
4.8	Form of Common Stock Purchase Warrant.	8-K	001-37383	4.1	5/18/2020
4.9	Form of Placement Agent Warrant.	8-K	001-37383	4.2	5/18/2020
4.10	Form of Common Stock Purchase Warrant.	8-K	001-37383	4.1	7/8/2020
4.11	Form of Placement Agent Warrant.	8-K	001-37383	4.2	7/8/2020
4.12	Form of Investor Warrant.	8-K	001-37383	4.1	12/22/2020
4.13	Form of Placement Agent Warrant.	8-K	001-37383	4.2	12/22/2020
4.14	Form of Investor Warrant.	8-K	001-37383	4.1	1/29/2021
4.15	Form of Placement Agent Warrant.	8-K	001-37383	4.2	1/29/2021
10.1*	Form of Indemnification Agreement between the Registrant and each of its Officers and Directors.	S-1	333-202124	10.7	2/17/2015
10.2*	2006 Stock Plan, as amended and restated, and form of agreement thereunder.	S-1	333-202124	10.8	2/17/2015
10.3*	2015 Omnibus Equity Incentive Plan and forms of agreement thereunder.	S-1	333-232858	10.9	7/26/2019
10.4*	2015 Employee Stock Purchase Plan and form of agreement thereunder.	S-1/A	333-202124	10.10	5/11/2015
10.5*	Executive Incentive Bonus Plan.	S-1/A	333-202124	10.15	5/11/2015
10.6*	Amended and Restated Director Compensation Policy.	10-Q	001-37383	10.14	5/10/2016
10.7*	Form of Severance and Change in Control Agreement.	S-1/A	333-202124	10.18	4/6/2015
10.8	Base Office Lease dated March 17, 2003 between the Registrant and Pac West Office Equities, LP, including Amendments 1-7.	S-1	333-229047	10.16	12/27/2018
10.9*	Employment letter for Laura Pitlik, Chief Marketing Officer.	10-Q	001-37383	10.1	11/15/2021
10.10*	Severance and Change In Control Agreement for Laura Pitlik.	10-Q	001-37383	10.2	11/15/2021
10.11*	Separation and Release Agreement for Matt Plavan.	8-K	001-37383	10.1	12/20/2021
10.12*	Employment Letter and appended form of Severance and Change In Control Agreement between the Registrant and Pam Haley, dated October 1, 2019.	8-K/A	001-37383	10.2	10/7/2019

10.13+	Limited Liability Company Operating Agreement for Archipelago Ventures Hawaii, LLC, dated as of August 9, 2019.	8-K	001-37383	10.1	8/9/2019	
10.14	Securities Purchase Agreement dated as of March 19, 2018, between Arcadia Biosciences, Inc. and each purchaser named in the signature pages thereto.	8-K	001-37383	10.1	3/23/2018	
10.15	Form of Registration Rights Agreement.	8-K	001-37383	10.2	3/23/2018	
10.16	Form of Securities Purchase Agreement dated as of June 11, 2018, between Arcadia Biosciences, Inc. and each purchaser named in the signature pages thereto.	8-K	001-37383	10.1	6/14/2018	
10.17	Form of Securities Purchase Agreement dated as of June 12, 2019, between Arcadia Biosciences, Inc. and each purchaser named in the signature pages thereto.	8-K	001-37383	10.1	6/14/2019	
10.18	Form of Securities Purchase Agreement dated as of September 5, 2019, between Arcadia Biosciences, Inc. and each purchaser named in the signature pages thereto.	8-K	001-37383	10.1	9/9/2019	
10.19	Promissory Note, dated April 16, 2020, by and between MidFirst Bank and Arcadia Biosciences, Inc.	8-K	001-37383	10.1	4/21/2020	
10.20	Amendment No. 8 to the Office Lease dated March 17, 2003 between the Registrant and Pac West Office Equities, LP.	10-K	001-37383	10.8	5/12/2020	
10.21	Amendment No. 9 to the Office Lease dated March 17, 2003 between the Registrant and Pac West Office Equities, LP.	10-Q	001-37383	10.2	8/13/2020	
10.22	Form of Letter Agreement, dated as of May 14, 2020.	8-K	001-37383	10.1	5/18/2020	
10.23	Form of Letter Agreement, dated as of July 6, 2020.	8-K	001-37383	10.1	7/8/2020	
10.24	Form of Securities Purchase Agreement dated as of December 18, 2020, between Arcadia Biosciences, Inc. and each purchaser named on the signature pages thereto.	8-K	001-37383	10.1	12/22/2020	
10.25+	Master Transaction Agreement.	8-K	001-37383	10.2	12/22/2020	
10.26*	Employment letter for Chris Cuvelier, Chief Growth Officer.	10-Q	001-37383	10.1	8/16/2021	
10.27*	Severance and Change In Control Agreement for Chris Cuvelier.					X

10.28	Form of Securities Purchase Agreement dated as of January 25, 2021, between Arcadia Biosciences, Inc. and each purchaser named on the signature pages thereto.	8-K	001-37383	10.1	1/29/2021	
10.29	Form of Registration Rights Agreement dated as of January 25, 2021, between Arcadia Biosciences, Inc. and each purchaser named on the signature pages thereto.	8-K	001-37383	10.2	1/29/2021	
10.30+	Asset Purchase Agreement dated May 17, 2021, by and among Arcadia, Buyer, Seller, Eko, Lief, Zola and Parent.	8-K	001-37383	10.1	5/21/2021	
21.1	List of subsidiaries of the Registrant.	S-1	333-262407	21.1	1/28/2022	
23.1	Consent of Deloitte & Touche LLP, independent registered public accounting firm.					X
24.1	Power of attorney (included in the signature page to this filing).					X
31.1	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.					X
31.2	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.					X
32.1	Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.					X
32.2	Certification of Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.					X
101.INS	Inline XBRL Instance Document.					X
101.SCH	Inline XBRL Taxonomy Extension Schema Document.					X
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.					X
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.					X
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document.					X

101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.	X
104	Cover Page Interactive Data File (embedded within the Inline XBRL Document).	X

* Indicates a management contract or compensatory plan or arrangement.
+ Certain information has been excluded from this exhibit because it is not material and would likely cause competitive harm to the registrant if publicly disclosed.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized.

ARCADIA BIOSCIENCES, INC.

Date: March 31, 2022

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

Date: March 31, 2022

By: /s/ PAMELA HALEY
Pamela Haley
Chief Financial Officer
(Principal Financial and Accounting Officer)

Each person whose individual signature appears below hereby authorizes and appoints Stanley Jacot Jr. with full power of substitution and resubstitution and full power to act without the other, as his or her true and lawful attorney-in-fact and agent to act in his or her name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorneys-in-fact and agents or any of them or their or his substitute or substitutes may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Report has been signed below by the following persons on behalf of the registrant in the capacities and on the dates indicated.

Name	Title	Date
/s/ ALBERT B. BOLLES **Albert D. Bolles**	**Director**	March 31, 2022
/s/ KEVIN COMCOWICH **Kevin Comcowich**	**Director**	March 31, 2022
/s/ LILIAN SHACKELFORD MURRAY **Lilian Shackelford Murray**	**Director**	March 31, 2022
/s/ GREGORY D. WALLER **Gregory D. Waller**	**Director**	March 31, 2022
/s/ AMY YODER **Amy Yoder**	**Director**	March 31, 2022
/s/ DEBORAH D. CAROSELLA **Deborah D. Carosella**	**Director**	March 31, 2022

SEVERANCE AND CHANGE IN CONTROL AGREEMENT

This Severance and Change in Control Agreement (the "**Agreement**") is made and entered into by and between Chris Cuvelier ("**Executive**") and Arcadia Biosciences, Inc. (the "**Company**"), effective as of July 20, 2021 (the "**Effective Date**").

RECITALS

1. The Compensation Committee of the Board of Directors of the Company (the "**Committee**") recognizes that it is possible that the Company could terminate Executive's employment with the Company and from time to time the Company may consider the possibility of an acquisition by another company or other change in control transaction. The Committee also recognizes that such considerations can be a distraction to Executive and can cause Executive to consider alternative employment opportunities. The Committee has determined that it is in the best interests of the Company and its stockholders to assure that the Company will have the continued dedication and objectivity of Executive, notwithstanding the possibility, threat or occurrence of such a termination of employment or the occurrence of a Change in Control (as defined herein) of the Company.

2. The Committee believes that it is in the best interests of the Company and its stockholders to provide Executive with an incentive to continue his or her employment with the Company and to motivate Executive to maximize the value of the Company for the benefit of its stockholders.

3. The Committee believes that it is imperative to provide Executive with certain severance benefits upon Executive's termination of employment and with certain additional benefits following a Change in Control. These benefits will provide Executive with enhanced financial security and incentive and encouragement to remain with the Company notwithstanding the possibility of a Change in Control.

4. The Company and Executive have entered into an employment terms letter dated as of May 17, 2021 (the "**Employment Letter**").

5. The Company and Executive wish to state the terms of Executive's severance and benefits (whether or not in connection with a Change in Control) and replace any and all such provisions providing for severance and/or change in control payments, as set forth below. All other terms and conditions of the Employment Letter will remain in full force and effect.

6. Certain capitalized terms used in the Agreement are defined in Section 6 below.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual covenants contained herein, the parties hereto agree as follows:

1. Term of Agreement. The Agreement shall terminate on the third (3rd) anniversary of the Effective Date (the "**Term End Date**"); provided, however, that if as of the Term End Date Executive is receiving benefits under Section 3 of this Agreement, then the Agreement shall continue in effect until such date as all of the obligations of the parties hereto with respect to this Agreement have been satisfied.

2. At-Will Employment. The Company and Executive acknowledge that, notwithstanding this Agreement and any benefits provided for herein, Executive's employment is and will continue to be at-will, as defined under applicable law. If Executive's employment terminates for any reason, including (without limitation) any termination of employment not set forth in Section 3, Executive will not be entitled to any payments, benefits, damages, awards or compensation other than the payment of accrued but unpaid wages and vacation, if any, as required by law, and any unreimbursed reimbursable expenses or pursuant to written agreements with the Company, including equity award agreements.

7. Severance Benefits.

(a) Termination without Cause and not in Connection with a Change in Control. If the Company terminates Executive's employment with the Company for a reason other than Cause, Executive becoming Disabled, or Executive's death, at any time other than during the twelve (12)-month period immediately following a Change in Control, then, subject to Section 4, Executive will receive the following severance benefits from the Company:

(i) Accrued Compensation. The Company will pay Executive all accrued but unpaid vacation, expense reimbursements, wages, and other benefits due to Executive under any Company-provided plans, policies, and arrangements.

(ii) Severance Payment. Executive will receive continuing payments of severance for a period of three (3) months (such number of months, the "**Standard Severance Period**") from the date of such termination of employment at a rate equal to Executive's base salary as in effect immediately prior to the date of Executive's termination of employment (disregarding any reduction in base salary that triggers the right to termination for Good Reason), less all required tax withholdings and other applicable deductions, which will be paid in accordance with the Company's regular payroll procedures.

(iii) Continued Employee Benefits. If Executive elects continuation coverage pursuant to the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("**COBRA**") for Executive and Executive's eligible dependents, within the time period prescribed pursuant to COBRA, the Company will reimburse Executive for the COBRA premiums for such coverage (at the coverage levels in effect immediately prior to Executive's termination or resignation) until the earlier of (A) the end of the Standard Severance Period, or (B) the date upon which Executive and/or Executive's eligible dependents becomes covered under similar plans. COBRA reimbursements will be made by the Company to Executive consistent with the Company's normal expense reimbursement policy and will be taxable to the extent required to

avoid adverse consequences to Executive or the Company under either Code Section 105(h) or the Patient Protection and Affordable Care Act of 2010.

(iv) Pro-Rated Bonus. Following the end of the year in which Executive's employment with the Company terminates, but no later than March 15 of such following year, the Committee, and if applicable, the Company's Board of Directors ("**Board**"), shall determine in good faith the annual cash bonus that Executive would have been entitled to receive for the year of termination if Executive had remained employed by the Company through the end of such year (such hypothetical bonus, the "**Termination Year Bonus**"). The Company will pay Executive a pro-rated portion of the Termination Year Bonus based on the percentage of the year that Executive was employed by the Company in the year of termination. This amount will be payable on or before the earlier of (i) March 15 of the year immediately following the year of Executive's termination and (ii) the date that the Company pays annual cash bonuses to other executives of the Company with respect to the year of Executive's termination.

(v) Payments or Benefits Required by Law. Executive will receive such other compensation or benefits from the Company as may be required by law.

(b) Termination without Cause or Resignation for Good Reason in Connection with a Change in Control. If during the twelve (12)-month period immediately following a Change in Control, (x) the Company terminates Executive's employment with the Company for a reason other than Cause, Executive becoming Disabled, or Executive's death, or (y) Executive resigns from such employment for Good Reason, then, subject to Section 4, Executive will receive the following severance benefits from the Company in lieu of the benefits described in Section 3(a) above:

(i) Accrued Compensation. The Company will pay Executive all accrued but unpaid vacation, expense reimbursements, wages, and other benefits due to Executive under any Company-provided plans, policies, and arrangements.

(ii) Severance Payment. Executive will receive continuing payments of severance for a period of twelve (12) months (such number of months, the "**Enhanced Severance Period**") from the date of such termination of employment at a rate equal to Executive's base salary as in effect immediately prior to the date of Executive's termination of employment (disregarding any reduction in base salary that triggers the right to termination for Good Reason), less all required tax withholdings and other applicable deductions, which will be paid in accordance with the Company's regular payroll procedures.

(iii) Continued Employee Benefits. If Executive elects continuation coverage pursuant to COBRA for Executive and Executive's eligible dependents, within the time period prescribed pursuant to COBRA, the Company will reimburse Executive for the COBRA premiums for such coverage (at the coverage levels in effect immediately prior to Executive's termination or resignation) until the earlier of (A) the end of the Enhanced Severance Period, or (B) the date upon which Executive and/or Executive's eligible dependents becomes covered under similar plans. COBRA reimbursements will be made by the Company to Executive consistent with the Company's normal expense reimbursement policy and will be taxable to the extent required to avoid adverse consequences to Executive or the Company under either Code Section 105(h) or the Patient Protection and Affordable Care Act of 2010.

(iv) Equity. Executive will be entitled to accelerated vesting as to one hundred percent (100%) of the then-unvested portion of all of Executive's outstanding equity awards.

(v) Pro-Rated Bonus. Following the end of the year in which Executive's employment with the Company terminates, but no later than March 15 of such following year, the Committee, and if applicable, the Board, shall determine in good faith the Termination Year Bonus (as defined above). The Company will pay Executive a pro-rated portion of the Termination Year Bonus based on the percentage of the year that Executive was employed by the Company in the year of termination. This amount will be payable on or before the earlier of (i) March 15 of the year immediately following the year of Executive's termination and (ii) the date that the Company pays annual cash bonuses to other executives of the Company with respect to the year of Executive's termination.

(vi) Payments or Benefits Required by Law. Executive will receive such other compensation or benefits from the Company as may be required by law.

(c) Disability; Death. If Executive's employment with the Company is terminated due to Executive becoming Disabled or Executive's death, then Executive or Executive's estate (as the case may be) will (i) receive the earned but unpaid base salary through the date of termination of employment, (ii) receive all accrued vacation, expense reimbursements and any other benefits due to Executive through the date of termination of employment in accordance with Company-provided or paid plans, policies and arrangements, and (iii) not be entitled to any other compensation or benefits from the Company except to the extent required by law (for example, COBRA).

(d) Voluntary Resignation; Termination for Cause. If Executive voluntarily terminates Executive's employment with the Company (other than for Good Reason following a Change in Control) or if the Company terminates Executive's employment with the Company for Cause, then Executive will (i) receive his or her earned but unpaid base salary through the date of termination of employment, (ii) receive all accrued vacation, expense reimbursements and any other benefits due to Executive through the date of termination of employment in accordance with established Company-provided or paid plans, policies and arrangements, and (iii) not be entitled to any other compensation or benefits (including, without limitation, accelerated vesting of any equity awards) from the Company except to the extent provided under agreement(s) relating to any equity awards or as may be required by law (for example, COBRA).

(e) Timing of Payments. Subject to Section 4, payment of the severance and benefits hereunder shall be made or commence to be made as soon as practicable following Executive's termination of employment.

(f) Exclusive Remedy. In the event of a termination of Executive's employment with the Company pursuant to Section 3(a) or Section 3(b), the provisions of this Section 3 are intended to be and are exclusive and in lieu of any other rights or remedies to which Executive or the Company may otherwise be entitled, whether at law, tort or contract, in equity, or under this Agreement (other than the payment of accrued but unpaid wages, as required by law, and any unreimbursed reimbursable expenses). Executive will be entitled to no other severance, benefits, compensation or other payments or rights upon a termination of employment, including, without limitation, any severance payments and/or benefits provided in the Employment Agreement, other

than those benefits expressly set forth in Section 3 of this Agreement or pursuant to written equity award agreements with the Company.

8. Conditions to Receipt of Severance.

(a) Release of Claims Agreement. In the event of a termination of Executive's employment with the Company pursuant to Section 3(a) or Section 3(b), the receipt of any severance payments or benefits pursuant to this Agreement is subject to Executive signing and not revoking a separation agreement and release of claims in a form acceptable to the Company (the "**Release**"), which must become effective no later than the sixtieth (60th) day following Executive's termination of employment (the "**Release Deadline**"), and if not, Executive will forfeit any right to severance payments or benefits under this Agreement. To become effective, the Release must be executed by Executive and any revocation periods (as required by statute, regulation, or otherwise) must have expired without Executive having revoked the Release. In addition, in no event will severance payments or benefits be paid or provided until the Release actually becomes effective. If the termination of employment occurs at a time during the calendar year where the Release Deadline could occur in the calendar year following the calendar year in which Executive's termination of employment occurs, then any severance payments or benefits under this Agreement that would be considered Deferred Payments (as defined in Section 4(d)(i)) will be paid on the first payroll date to occur during the calendar year following the calendar year in which such termination occurs, or such later time as required by (i) the payment schedule applicable to each payment or benefit as set forth in Section 3, (ii) the date the Release becomes effective, or (iii) Section 4(d)(ii); provided that the first payment shall include all amounts that would have been paid to Executive if payment had commenced on the date of Executive's termination of employment.

(b) Non-solicitation. Executive agrees, to the extent permitted by applicable law, that in the event the Executive receives severance pay or other benefits pursuant to Section 3(a) or 3(b) above, for the number of months of severance provided to Executive pursuant to Section 3(a)(ii) or 3(b)(ii), as applicable, immediately following the date of Executive's termination, Executive, as a condition to receipt of severance pay and benefits under Sections 3(a) and 3(b), will not directly or indirectly, solicit, induce, recruit, or encourage any employee of the Company to leave his or her employment either for Executive or for any other entity or person. In the event Executive violates the provisions of this Section 4(b), all severance pay and other benefits to which Executive may otherwise be entitled pursuant to Section 3(a) or 3(b) shall cease immediately.

The covenant contained in this Section 4(b) hereof shall be construed as a series of separate covenants, one for each country, province, state, city or other political subdivision in which the Company currently engages in its business or, during the term of this Agreement, becomes engaged in its business. Except for geographic coverage, each such separate covenant shall be deemed identical in terms to the covenant contained in this Section 4(b). If, in any judicial proceeding, a court refuses to enforce any of such separate covenants (or any part thereof), then such unenforceable covenant (or such part) shall be eliminated from this Agreement to the extent necessary to permit the remaining separate covenants (or portions thereof) to be enforced. In the event that the provisions of this Section 4(b) are deemed to exceed the time, geographic or scope limitations permitted by applicable law, then such provisions shall be reformed to the maximum time, geographic or scope limitations, as the case may be, permitted by applicable law.

(c) Confidential Information Agreement and Other Requirements. Executive's receipt of any payments or benefits under Section 3 (except for those required by law) will be subject to Executive continuing to comply with the terms of the Confidential Information Agreement (as defined in Section 9) executed by Executive in favor of the Company and the provisions of this Agreement.

(d) Section 409A.

(i) Notwithstanding anything to the contrary in this Agreement, no severance pay or benefits to be paid or provided to Executive, if any, pursuant to this Agreement that, when considered together with any other severance payments or separation benefits, are considered deferred compensation not exempt under Section 409A (together, the "**Deferred Payments**") will be paid or otherwise provided until Executive has a "separation from service" within the meaning of Section 409A. And for purposes of this Agreement, any reference to "termination of employment," "termination" or any similar term shall be construed to mean a "separation from service" within the meaning of Section 409A. Similarly, no severance payable to Executive, if any, pursuant to this Agreement that otherwise would be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9) will be payable until Executive has a "separation from service" within the meaning of Section 409A.

(ii) Notwithstanding anything to the contrary in this Agreement, if Executive is a "specified employee" within the meaning of Section 409A at the time of Executive's termination of employment (other than due to death), then the Deferred Payments, if any, that are payable within the first six (6) months following Executive's separation from service, will become payable on the first payroll date that occurs on or after the date six (6) months and one (1) day following the date of Executive's separation from service. All subsequent Deferred Payments, if any, will be payable in accordance with the payment schedule applicable to each payment or benefit. Notwithstanding anything herein to the contrary, if Executive dies following Executive's separation from service, but prior to the six (6) month anniversary of the separation from service, then any payments delayed in accordance with this paragraph will be payable in a lump sum as soon as administratively practicable after the date of Executive's death and all other Deferred Payments will be payable in accordance with the payment schedule applicable to each payment or benefit. Each payment, installment and benefit payable under this Agreement is intended to constitute a separate payment for purposes of Section 1.409A-2(b)(2) of the Treasury Regulations.

(iii) Without limitation, any amount paid under this Agreement that satisfies the requirements of the "short-term deferral" rule set forth in Section 1.409A-1(b)(4) of the Treasury Regulations is not intended to constitute Deferred Payments for purposes of clause (i) above.

(iv) Without limitation, any amount paid under this Agreement that qualifies as a payment made as a result of an involuntary separation from service pursuant to Section 1.409A-1(b)(9)(iii) of the Treasury Regulations that does not exceed the Section 409A Limit is not intended to constitute Deferred Payments for purposes of clause (i) above. Any payment intended to qualify under this exemption must be made within the allowable time period specified in Section 1.409A-1(b)(9)(iii) of the Treasury Regulations.

(v) To the extent that reimbursements or in-kind benefits under this Agreement constitute non-exempt "nonqualified deferred compensation" for purposes of Section

409A, (1) all reimbursements hereunder shall be made on or prior to the last day of the calendar year following the calendar year in which the expense was incurred by Executive, (2) any right to reimbursement or in-kind benefits shall not be subject to liquidation or exchange for another benefit, and (3) the amount of expenses eligible for reimbursement or in-kind benefits provided in any calendar year shall not in any way affect the expenses eligible for reimbursement or in-kind benefits to be provided, in any other calendar year.

(vi) Any tax gross-up that Executive is entitled to receive under this Agreement or otherwise shall be paid to Executive no later than December 31st of the calendar year following the calendar year in which Executive remits the related taxes.

(vii) Notwithstanding any other provision of this Agreement to the contrary, in no event shall any payment under this Agreement that constitutes "nonqualified deferred compensation" for purposes of Code Section 409A be subject to offset by any other amount unless otherwise permitted by Code Section 409A.

(viii) The foregoing provisions are intended to be exempt from or comply with the requirements of Section 409A so that none of the severance payments and benefits to be provided hereunder will be subject to the additional tax imposed under Section 409A, and any ambiguities or ambiguous terms herein will be interpreted to be exempt or so comply. The Company and Executive agree to work together in good faith to consider amendments to this Agreement and to take such reasonable actions which are necessary, appropriate or desirable to avoid imposition of any additional tax or income recognition prior to actual payment to Executive under Section 409A.

9. Limitation on Payments.

(a) Anything in this Agreement to the contrary notwithstanding, if any payment or benefit Executive would receive from the Company or otherwise ("**Payment**") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code; and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "**Excise Tax**"), then such Payment shall be equal to the Reduced Amount. The "**Reduced Amount**" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment being subject to the Excise Tax; or (y) the largest portion, up to and including the total, of the Payment, whichever amount, after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in Executive's receipt, on an after-tax basis, of the greater amount of the Payment. Any reduction made pursuant to this Section 5(a) shall be made in accordance with the following order of priority: (i) stock options whose exercise price exceeds the fair market value of the optioned stock ("**Underwater Options**"), (ii) Full Credit Payments (as defined below), that are payable in cash, (iii) non-cash Full Credit Payments that are taxable, (iv) non-cash Full Credit Payments that are not taxable, (v) Partial Credit Payments (as defined below) and (vi) non-cash employee welfare benefits. In each case, reductions shall be made in reverse chronological order such that the payment or benefit owed on the latest date following the occurrence of the event triggering the excise tax will be the first payment or benefit to be reduced (with reductions made pro-rata in the event payments or benefits are owed at the same time). "**Full Credit Payment**" means a payment, distribution or benefit, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise, that if reduced in value by one dollar reduces the amount of the parachute payment (as defined in Section 280G of the Code) by one dollar, determined as if such

payment, distribution or benefit had been paid or distributed on the date of the event triggering the excise tax. "**Partial Credit Payment**" means any payment, distribution or benefit that is not a Full Credit Payment. In no event shall the Executive have any discretion with respect to the ordering of payment reductions.

(b) Unless the Company and Executive otherwise agree in writing, any determination required under this Section 5 will be made in writing by an independent firm (the "**Firm**"), whose determination will be conclusive and binding upon Executive and the Company for all purposes. For purposes of making the calculations required by this Section 5, the Firm may make reasonable assumptions and approximations concerning applicable taxes and may rely on reasonable, good faith interpretations concerning the application of Sections 280G and 4999 of the Code. The Company and Executive will furnish to the Firm such information and documents as the Firm may reasonably request in order to make a determination under this Section 5. The Company will bear all costs the Firm may reasonably incur in connection with any calculations contemplated by this Section 5.

10. Definition of Terms. The following terms referred to in this Agreement will have the following meanings:

(a) Cause. "**Cause**" means:

(i) Executive's conviction of, or pleading guilty or nolo contendere to, any felony or a lesser crime involving dishonesty or moral turpitude;

(ii) Executive's willful failure to perform Executive's duties and responsibilities to the Company or Executive's violation of any written Company policy or agreement;

(iii) Executive's commission of any act of fraud, embezzlement, dishonesty against the Company or any other intentional misconduct that has caused or is reasonably expected to result in injury to the Company;

(iv) Executive's unauthorized use or disclosure of any proprietary information or trade secrets of the Company or any other party to whom the Executive owes an obligation of nondisclosure as a result of his or her relationship with the Company;

(v) Executive's failure to reasonably cooperate with the Company in any investigation or formal proceeding after receiving a written request to do so; or

(vi) Executive's material breach of any of his or her obligations under any written agreement or covenant with the Company.

(b) Change in Control. "**Change in Control**" means the occurrence of any of the following:

(i) The consummation of a merger or consolidation of the Company with or into another entity or any other corporate reorganization, if the Company's stockholders immediately prior to such merger, consolidation or reorganization cease to directly or indirectly own immediately after such merger, consolidation or reorganization at least a majority of the

combined voting power of the continuing or surviving entity's securities outstanding immediately after such merger, consolidation or other reorganization;

(ii) The consummation of the sale, transfer or other disposition of all or substantially all of the Company's assets (other than (x) to a corporation or other entity of which at least a majority of its combined voting power is owned directly or indirectly by the Company, (y) to a corporation or other entity owned directly or indirectly by the stockholders of the Company in substantially the same proportions as their ownership of the common stock of the Company or (z) to a continuing or surviving entity described in Section 6(b)(i) in connection with a merger, consolidation or corporate reorganization which does not result in a Change in Control under Section 6(b)(i));

(iii) A change in the effective control of the Company which occurs on the date that a majority of members of the Board is replaced during any twelve (12) month period by Directors whose appointment or election is not endorsed by a majority of the members of the Board prior to the date of the appointment or election. For purposes of this clause, if any Person (as defined below in Section 6(b)(iv)) is considered to be in effective control of the Company, the acquisition of additional control of the Company by the same Person will not be considered a Change in Control; or

(iv) The consummation of any transaction as a result of which any Person becomes the "beneficial owner" (as defined in Rule 13d-3 under the Securities Exchange Act of 1934, as amended (the "**Exchange Act**")), directly or indirectly, of securities of the Company representing at least fifty percent (50%) of the total voting power represented by the Company's then outstanding voting securities. For purposes of this clause (iv), the term "person" shall have the same meaning as when used in sections 13(d) and 14(d) of the Exchange Act but shall exclude:

(1) a trustee or other fiduciary holding securities under an employee benefit plan of the Company or an affiliate of the Company;

(2) a corporation or other entity owned directly or indirectly by the stockholders of the Company in substantially the same proportions as their ownership of the common stock of the Company;

(3) the Company; and

(4) a corporation or other entity of which at least a majority of its combined voting power is owned directly or indirectly by the Company.

A transaction shall not constitute a Change in Control if its sole purpose is to change the state of the Company's incorporation or to create a holding company that will be owned in substantially the same proportions by the persons who held the Company's securities immediately before such transactions. For the avoidance of doubt, an initial public offering of the common stock of the Company shall not constitute a Change in Control for purposes of this Agreement.

(c) Code. "**Code**" means the Internal Revenue Code of 1986, as amended.

(d) Disability. "**Disability**" means that because of a physical or medical impairment, Executive is unable, with or without reasonable accommodation, to perform the

essential functions pertaining to Executive's position with the Company for a period exceeding 4 months.

(e) Good Reason. "**Good Reason**" means Executive's termination of employment within ninety (90) days following the expiration of any cure period (discussed below) following the occurrence, without Executive's consent, of one or more of the following:

(i) A material reduction of Executive's duties, authority or responsibilities, relative to Executive's duties, authority or responsibilities in effect immediately prior to such reduction; provided, however, that a reduction in duties, authority or responsibilities solely by virtue of the Company being acquired and made part of a larger entity (as, for example, when the Chief Marketing Officer of the Company remains as such following a Change of Control but is not made the Chief Marketing Officer of the acquiring corporation) will not constitute Good Reason;

(ii) A material reduction in Executive's base compensation (except where there is a reduction applicable to all similarly situated executive officers generally); provided, that a reduction of less than ten percent (10%) will not be considered a material reduction in base compensation;

(iii) A material change in the geographic location of Executive's primary work facility or location; provided, that a relocation of less than thirty-five (35) miles from Executive's then-present work location will not be considered a material change in geographic location; or

(iv) A material breach by the Company of a material provision of this Agreement or a failure of a successor entity in the Change of Control to assume this Agreement;

Executive will not resign for Good Reason without first providing the Company with written notice within sixty (60) days of the event that Executive believes constitutes "Good Reason" specifically identifying the acts or omissions constituting the grounds for Good Reason and a reasonable cure period of not less than thirty (30) days following the date of such notice during which such condition must not have been cured.

(f) Section 409A. "**Section 409A**" means Code Section 409A, and the final regulations and any guidance promulgated thereunder or any state law equivalent.

(g) Section 409A Limit. "**Section 409A Limit**" will mean two (2) times the lesser of: (i) Executive's annualized compensation based upon the annual rate of pay paid to Executive during the Executive's taxable year preceding the Executive's taxable year of his or her separation from service as determined under Treasury Regulation Section 1.409A-1(b)(9)(iii)(A)(1) and any Internal Revenue Service guidance issued with respect thereto; or (ii) the maximum amount that may be taken into account under a qualified plan pursuant to Section 401(a)(17) of the Internal Revenue Code for the year in which Executive's separation from service occurred.

11. Successors.

(a) The Company's Successors. Any successor to the Company (whether direct or indirect and whether by purchase, merger, consolidation, liquidation or otherwise) to all or substantially all of the Company's business and/or assets will assume the obligations under this Agreement and agree expressly to perform the obligations under this Agreement in the same

manner and to the same extent as the Company would be required to perform such obligations in the absence of a succession. For all purposes under this Agreement, the term "Company" will include any successor to the Company's business and/or assets which executes and delivers the assumption agreement described in this Section 7(a) or which becomes bound by the terms of this Agreement by operation of law.

(b) Executive's Successors. The terms of this Agreement and all rights of Executive hereunder will inure to the benefit of, and be enforceable by, Executive's personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees.

12. Arbitration.

(a) Arbitration. In consideration of Executive's employment with the Company, its promise to arbitrate all employment-related disputes, and Executive's receipt of the compensation, pay raises and other benefits paid to Executive by the Company, at present and in the future, Executive agrees that any and all controversies, claims, or disputes with anyone (including the Company and any employee, officer, director, stockholder or benefit plan of the Company in their capacity as such or otherwise) arising out of, relating to, or resulting from Executive's employment with the Company or termination thereof, including any breach of this Agreement, will be subject to binding arbitration under the Arbitration Rules set forth in California Code of Civil Procedure Section 1280 through 1294.2, including Section 1281.8 (the "***Act***"), and pursuant to California law. The Federal Arbitration Act shall also apply with full force and effect, notwithstanding the application of procedural rules set forth under the Act.

(b) Dispute Resolution. **Disputes that Executive agrees to arbitrate, and thereby agrees to waive any right to a trial by jury, include any statutory claims under local, state, or federal law** (except those which are expressly excluded by statute, state law, or applicable court decision from being resolved by mandatory arbitration), including, but not limited to, claims under Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, the Older Workers Benefit Protection Act, the Sarbanes Oxley Act, the Worker Adjustment and Retraining Notification Act, the California Fair Employment and Housing Act, the Family and Medical Leave Act, the California Family Rights Act, the California Labor Code, claims of harassment, discrimination, and wrongful termination, and any statutory or common law claims. Executive further understands that this Agreement to arbitrate also applies to any disputes that the Company may have with Executive.

(c) Procedure. Executive agrees that any arbitration will be administered by the Judicial Arbitration & Mediation Services, Inc. ("**JAMS**"), pursuant to its Employment Arbitration Rules & Procedures (the "**JAMS Rules**"). The arbitrator shall have the power to decide any motions brought by any party to the arbitration, including motions for summary judgment and/or adjudication, motions to dismiss and demurrers, and motions for class certification, prior to any arbitration hearing. The arbitrator shall have the power to award any remedies available under applicable law, and the arbitrator shall award attorneys' fees and costs to the prevailing party, except as prohibited by law. The Company will pay for any administrative or hearing fees charged by the administrator or JAMS, and all arbitrator's fees, except that Executive shall pay any filing fees associated with any arbitration that Executive initiates, but only so much of the filing fee as Executive would have instead paid had Executive filed a complaint in a court of law. Executive agrees that the arbitrator shall administer and conduct any arbitration in accordance with California

law, including the California Code of Civil Procedure and the California Evidence Code, and that the arbitrator shall apply substantive and procedural California law to any dispute or claim, without reference to the rules of conflict of law. To the extent that the JAMS Rules conflict with California law, California law shall take precedence. The decision of the arbitrator shall be in writing. Any arbitration under this Agreement shall be conducted in Sacramento County, California.

(d) Remedy. Except as provided by the Act, arbitration shall be the sole, exclusive, and final remedy for any dispute between Executive and the Company. **Accordingly, except as provided by the Act and this Agreement, neither Executive nor the Company will be permitted to pursue court action regarding claims that are subject to arbitration**. Notwithstanding, the arbitrator will not have the authority to disregard or refuse to enforce any lawful Company policy, and the arbitrator will not order or require the Company to adopt a policy not otherwise required by law that the Company has not adopted.

(e) Administrative Relief. Executive is not prohibited from pursuing an administrative claim with a local, state, or federal administrative body or government agency that is authorized to enforce or administer laws related to employment, including, but not limited to, the Department of Fair Employment and Housing, the Equal Employment Opportunity Commission, the National Labor Relations Board, or the Workers' Compensation Board. However, Executive may not pursue court action regarding any such claim, except as permitted by law.

(f) Voluntary Nature of Agreement. Executive acknowledges and agrees that Executive is executing this Agreement voluntarily and without any duress or undue influence by the Company or anyone else. Executive further acknowledges and agrees that Executive has carefully read this Agreement and that Executive has asked any questions needed for Executive to understand the terms, consequences and binding effect of this Agreement and fully understands it, including that ***EXECUTIVE IS WAIVING EXECUTIVE'S RIGHT TO A JURY TRIAL***. Finally, Executive agrees that Executive has been provided an opportunity to seek the advice of an attorney of Executive's choice before signing this Agreement.

13. Confidential Information. Executive agrees to continue to comply with and be bound by the Confidentiality and Intellectual Property Rights Agreement (the "**Confidential Information Agreement**") entered into by and between Executive and the Company, dated July 12, 2021.

14. Notice.

(a) General. Notices and all other communications contemplated by this Agreement will be in writing and will be deemed to have been duly given when personally delivered or when mailed by U.S. registered or certified mail, return receipt requested and postage prepaid. In the case of Executive, mailed notices will be addressed to him or her at the home address which he or she most recently communicated to the Company in writing. In the case of the Company, mailed notices will be addressed to its corporate headquarters, and all notices will be directed to the attention of its General Counsel.

(b) Notice of Termination. Any termination by the Company for Cause or by Executive for Good Reason will be communicated by a notice of termination to the other party hereto given in accordance with Section 10(a) of this Agreement. Such notice will indicate the

specific termination provision in this Agreement relied upon, will set forth in reasonable detail the facts and circumstances claimed to provide a basis for termination under the provision so indicated, and will specify the termination date (which will be not more than thirty (30) days after the giving of such notice). The failure by Executive to include in the notice any fact or circumstance which contributes to a showing of Good Reason will not waive any right of Executive hereunder or preclude Executive from asserting such fact or circumstance in enforcing his or her rights hereunder.

15. Miscellaneous Provisions.

(a) No Duty to Mitigate. Executive will not be required to mitigate the amount of any payment contemplated by this Agreement, nor will any such payment be reduced by any earnings that Executive may receive from any other source.

(b) Waiver. No provision of this Agreement will be modified, waived or discharged unless the modification, waiver or discharge is agreed to in writing and signed by Executive and by an authorized officer of the Company (other than Executive). No waiver by either party of any breach of, or of compliance with, any condition or provision of this Agreement by the other party will be considered a waiver of any other condition or provision or of the same condition or provision at another time.

(c) Headings. All captions and section headings used in this Agreement are for convenient reference only and do not form a part of this Agreement.

(d) Entire Agreement. This Agreement constitutes the entire agreement of the parties hereto and supersedes in their entirety all prior or contemporaneous representations, understandings, undertakings or agreements (whether oral or written and whether expressed or implied) of the parties with respect to the subject matter hereof, including, without limitation, any severance provisions contained in the Employment Agreement. Executive acknowledges and agrees that this Agreement encompasses all the rights of Executive to any severance payments and/or benefits based on the termination of Executive's employment and Executive hereby agrees that he or she has no such rights except as stated herein. No waiver, alteration, or modification of any of the provisions of this Agreement will be binding unless in writing and signed by duly authorized representatives of the parties hereto and which specifically mention this Agreement.

(e) Choice of Law. The validity, interpretation, construction and performance of this Agreement will be governed by the laws of the State of California (with the exception of its conflict of laws provisions).

(f) Severability. The invalidity or unenforceability of any provision or provisions of this Agreement will not affect the validity or enforceability of any other provision hereof, which will remain in full force and effect.

(g) Withholding. All payments made pursuant to this Agreement will be subject to withholding of applicable income, employment and other taxes, as determined in the Company's reasonable judgment.

(h) Counterparts. This Agreement may be executed in counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument.

[Signature Page Follows]

IN WITNESS WHEREOF, each of the parties has executed this Agreement, in the case of the Company by its duly authorized officer, on the day and year set forth below.

COMPANY ARCADIA BIOSCIENCES, INC.

By: /s/ Matthew T. Plavan

Name: Matthew Plavan

Title: President and Chief Executive Officer

Date: 8/20/2021

EXECUTIVE CHRIS CUVELIER

By: /s/ Chris Cuvelier

Date: 8/20/2021 (returned 11/19/2021)

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement Nos. 333-229047, 333-232858, 333-235446, and 333-262407 on Form S-1, Registration Statement Nos. 333-224061, 333-224893, 333-239641 and 333-252659 on Form S-3, and Registration Statement Nos. 333-204215, 333-210023, 333-216545, 333-223805, 333-232072, 333-237438, and 333-256599 on Form S-8 of our report dated March 31, 2022, relating to the financial statements of Arcadia Biosciences, Inc. appearing in this Annual Report on Form 10-K for the year ended December 31, 2021.

/s/ Deloitte & Touche LLP

Phoenix, Arizona
March 31, 2022

Exhibit 31.1

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

I, Stanley E. Jacot Jr., certify that:

1. I have reviewed this Annual Report on Form 10-K of Arcadia Biosciences, Inc.;

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

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

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

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

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

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

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

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

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

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

Date: March 31, 2022

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

Exhibit 31.2

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

I, Pamela Haley, certify that:

1. I have reviewed this Annual Report on Form 10-K of Arcadia Biosciences, Inc.;

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

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

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

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

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

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

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

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

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

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

Date: March 31, 2022

By: /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 Annual Report of Arcadia Biosciences, Inc. (the "Company") on Form 10-K for the year ended December 31, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I 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.

Date: March 31, 2022

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

Exhibit 32.2

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

In connection with the Annual Report of Arcadia Biosciences, Inc. (the "Company") on Form 10-K for the year ended December 31, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I 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.

Date: March 31, 2022

By: /s/ PAMELA HALEY
Pamela Haley
Chief Financial Officer
(Principal Financial Officer)