

Prospectus

ARCADIA BIOSCIENCES, INC.

12,209,015
Common Stock

This prospectus covers the sale or other disposition from time to time of up to 12,209,015 shares of our common stock, \$0.001 par value per share, by the selling stockholders identified in this prospectus, including their transferees, pledgees, donees or successors. The selling stockholders may, from time to time, sell, transfer, or otherwise dispose of any or all of their shares of common stock or interests in shares of common stock on any stock exchange, market, or trading facility on which the shares are traded or in private transactions. These dispositions may be at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices.

We are not offering any shares of our common stock for sale under this prospectus. We will not receive any of the proceeds from the sale or other disposition of the shares of our common stock by the selling stockholders.

Our common stock is listed on the NASDAQ Capital Market under the symbol "RKDA." On February 10, 2021, the last reported sale price of our common stock was \$5.69 per share.

INVESTING IN OUR SECURITIES INVOLVES RISKS. YOU SHOULD REVIEW CAREFULLY THE RISKS AND UNCERTAINTIES DESCRIBED UNDER THE HEADING "[RISK FACTORS](#)" CONTAINED ON PAGE 1 HEREIN AND IN OUR ANNUAL REPORT ON FORM 10-K FOR THE YEAR ENDED DECEMBER 31, 2019, AS WELL AS OUR SUBSEQUENTLY FILED PERIODIC AND CURRENT REPORTS, WHICH WE FILE WITH THE SECURITIES AND EXCHANGE COMMISSION AND ARE INCORPORATED BY REFERENCE INTO THIS PROSPECTUS. YOU SHOULD READ THE ENTIRE PROSPECTUS CAREFULLY BEFORE YOU MAKE YOUR INVESTMENT DECISION.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED THESE SECURITIES OR DETERMINED IF THIS PROSPECTUS IS TRUTHFUL OR COMPLETE. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this prospectus is February 11, 2021.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the SEC using a “shelf” registration or continuous offering process.

You should read this prospectus and the information and documents incorporated by reference carefully. Such documents contain important information you should consider when making your investment decision. See “Where You Can Find Additional Information” and “Incorporation of Information by Reference” in this prospectus.

You should rely only on the information provided in this prospectus or documents incorporated by reference into this prospectus. We have not authorized anyone to provide you with different information. This prospectus covers offers and sales of our common stock only in jurisdictions in which such offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or of any sale of our common stock. You should not assume that the information contained in this prospectus is accurate as of any date other than the date on the front cover of this prospectus, or that the information contained in any document incorporated by reference is accurate as of any date other than the date of the document incorporated by reference, regardless of the time of delivery of this prospectus or any sale of a security.

In this prospectus, we refer to Arcadia Biosciences, Inc. as “we,” “us,” “our,” the “Company” or “RKDA.” You should rely only on the information we have provided or incorporated by reference in this prospectus, any applicable prospectus supplement and any related free writing prospectus. We have not authorized anyone to provide you with different information. No dealer, salesperson or other person is authorized to give any information or to represent anything not contained in this prospectus, any applicable prospectus supplement or any related free writing prospectus.

ABOUT ARCADIA BIOSCIENCES, INC.

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

We were founded in 2002, and our principal executive offices are located at 202 Cousteau Place, Suite 105, Davis, CA 95618. Our telephone number is (530) 756-7077. Our website is located at www.arcadiabio.com. Information contained on, or that can be accessed through, our website is not part of this prospectus.

RISK FACTORS

Any investment in our common stock or other securities involves a high degree of risk. Investors should carefully consider the risks described below, as well as the risks described in the documents incorporated or deemed to be incorporated by reference herein, and all of the information contained in this prospectus before deciding whether to purchase the securities offered hereby. Our business, financial condition, results of operations and prospects could be materially and adversely affected by these risks if any of them actually occur. The risks and uncertainties described below are not the only ones we face. Additional risks not currently known to us or other factors not perceived by us to present significant risks to our business at this time also could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our securities. This prospectus also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks we face as described below and elsewhere in this prospectus and in the documents incorporated or deemed to be incorporated by reference herein.

Risks Related to our Activities in the Legal Hemp Industry

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 has not yet established such a plan. We anticipate that many

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 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.

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.

We may be forced to dispose of hemp we produce should a harvested crop test in excess of 0.3% THC levels.

The USDA's Interim Final Ruling for hemp cultivation mandates that states test hemp crops and dispose of "hot" crops that exceed 0.3% THC. If a producer has produced cannabis exceeding the acceptable hemp THC level, the material must be disposed of in accordance with the CSA and DEA regulations because such material constitutes marijuana, a schedule I controlled substance under the CSA. Consequently, the material must be collected for destruction by a person authorized under the CSA to handle marijuana, such as a DEA-registered reverse distributor, or a duly authorized Federal, State, or local law enforcement officer. Arcadia is responsible for the costs of disposal of non-compliant crops for which it is the producer, which could potentially be significant should a large number of acres test positive. Arcadia incurred such a charge to cost of goods sold totaling \$1.3 million in the third quarter of 2020.

We have 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.

Because we have only recently begun our legal hemp operations, we anticipate our operating expenses will increase prior to earning revenue from these operations.

As we conduct research and development with respect to legal hemp, we anticipate significant increases in our operating expenses, and we may not realize significant revenues from such operations. As a result, the Company may incur significant financial losses with respect to such operations in the foreseeable future. There is no history upon which to base any assumption as to the likelihood that these operations will prove successful.

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 recent COVID-19 outbreak, could disrupt our business. Business disruptions could include disruptions to the productivity of our employees working remotely and restrictions on their travel may hinder their ability to meet with potential customers and close transactions, as well as temporary closures of the facilities of suppliers or contract growers in our supply chain. While we've seen very recent signs of improvement, hemp growers have been slower to make decisions to purchase hemp seeds due to economic uncertainty and wheat consumer packaged goods companies have been heavily focused on production over R&D evaluation as demand for staples like pasta and flour have increased. In addition, the COVID-19 outbreak may result in a severe economic downturn and has already significantly affected the financial markets of many countries. A severe or prolonged economic downturn or political disruption could result in a variety of risks to our business, including our ability to raise capital when needed on acceptable terms, if at all. A weak or declining economy or political disruption could also strain our manufacturers or suppliers, possibly resulting in supply disruption, or cause our customers to delay making payments for our services. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the political or economic climate and financial market conditions could adversely impact our business.

We or our partners may not be successful in developing commercial products that incorporate our traits.

Our future growth depends on our ability to identify genes that will improve selected crop traits and license these genes to our collaborators to develop and commercialize seeds that contain the genes. Pursuant to our collaboration agreements, we are entitled to share in the revenues from the sale of products that integrate our trait. We expect it will take between nine and eighteen months before the first seeds integrating our agricultural traits complete the development process and become commercially available for sale, resulting in revenues for us. However, the development process could take longer than we anticipate or could ultimately fail to succeed in commercialization for any of the following reasons:

- our traits may not be successfully validated in one or more target crops;
- our traits may not have the desired effect sought by our collaborators in the relevant crop or geography, or under certain environmental conditions;
- relevant milestones under our agreements with collaborators may not be achieved; and
- we or our collaborators may be unable to complete the regulatory process for the products containing our traits.

If products containing our traits are never commercialized or are commercialized on a slower timeline than we anticipate, our ability to generate revenues and become profitable, as well as our long-term growth strategy, would be materially and adversely affected. For example, the development processes for one of our key agricultural traits have experienced delays related to regulatory matters, particularly in China, and we expect that these development processes may continue to face delays, which have negatively impacted the commercialization timelines for products containing such traits.

Even if we or our collaborators are successful in developing commercial products that incorporate our traits, such products may not achieve commercial success.

Our long-term growth strategy is dependent upon our ability, or our collaborators' ability, to incorporate our traits into a variety of crops with global scope. 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, for one or more of the following reasons, among others:

- products may fail to be effective in particular crops, geographies or circumstances, limiting their commercialization potential;
- our competitors may launch competing or more effective traits or products;
- the market for abiotic seed traits is evolving and not well established, and the market opportunities for any product we or our collaborators develop may be smaller than we or our collaborators believe;
- as we do not have a sales or marketing infrastructure for our agricultural yield traits, we depend entirely on our collaborators to commercialize our products, and they may fail to devote the necessary resources and attention to sell, market and distribute our current or any future products effectively;
- significant fluctuations in market prices for agricultural inputs and crops could have an adverse effect on the value of our traits;

- farmers are generally cautious in their adoption of new products and technologies, with conservative initial purchases and proof of product required prior to widespread deployment, and accordingly, it may take several growing seasons for farmers to adopt our or our collaborators' products on a large scale;
- farmers may reuse certain non-hybrid seeds from prior growing seasons in violation of applicable seed license agreements;
- we or our collaborators may not be able to produce high-quality seeds in sufficient amounts to meet demand; and
- we or our collaborators may decide, for whatever reason, not to commercialize products containing our traits.

Our financial condition and results of operations could be materially and adversely affected if any of the above were to occur.

Our product development cycle is uncertain, and we may never earn revenues from the sale of products containing our traits.

Research and development in the seed, agricultural biotechnology, and larger agriculture industries is expensive, prolonged, and entails considerable uncertainty. We and our collaborators may spend many years and dedicate significant financial and other resources, developing traits that will never be commercialized. The process of discovering, developing, and commercializing a seed trait through either genetic modification or advanced breeding involves multiple phases, and it may require from two to thirteen years or more from discovery to commercialization. The length of the process may vary depending on one or more of the complexities of the trait, the particular crop, and the intended geographical market involved. This long product development cycle is in large part attributable to the nature-driven breeding period for a commercial product, as well as a lengthy regulatory process.

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 \$28.9 million, and \$13.5 million for the years ended December 31, 2019 and 2018, respectively. As of December 31, 2019, we had an accumulated deficit of \$207.2 million. Net cash used in operations was \$17.2 million and \$13.6 million for the years ended December 31, 2019 and 2018, 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 incorporating our traits, our losses in future periods could be even more significant. In addition, we may find our development 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.

In addition, our ability to generate meaningful revenues and achieve and maintain profitability depends on our ability, alone or with strategic collaborators, to successfully commercialize our products and complete the development of and complete the regulatory process to commercialize our traits. Most of our revenues since inception have consisted of upfront and milestone payments associated with our contract research and license agreements. Additional revenues from these agreements are not expected to be significant. To date, we have not generated any significant revenues from product sales other than from our SONOVA products. If we are unsuccessful in selling our commercial wheat or hemp products, or products containing our traits fail to achieve market acceptance or generate significant revenues, we may never become profitable.

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 research and 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.

If ongoing or future field trials by us or our collaborators are unsuccessful, we may be unable to complete the regulatory process for or commercialize our products in development on a timely basis.

The successful completion of field trials in the United States and foreign locations is critical to the success of product development and marketing efforts for products containing our traits. If our ongoing or future field trials, or those of our collaborators, are unsuccessful or produce inconsistent results or unanticipated adverse effects on crops or on non-target organisms, or if we or our collaborators are unable to collect reliable data, regulatory review of products in development containing our traits could be delayed or commercialization of products in development containing our traits may not be possible. In addition, more than one growing season may be required to collect sufficient data to develop or market a product containing our traits, and it may be necessary to collect data

from different geographies to prove performance for customer adoption. Even in cases where field trials are successful, we cannot be certain that additional field trials conducted on a greater number of acres, or in different crops or geographies, will be successful. Generally, our collaborators conduct these field trials, or we pay third parties, such as farmers, consultants, contractors, and universities, to conduct field trials on our behalf. Poor trial execution or data collection, failure to follow required agronomic practices, regulatory requirements, or mishandling of products in development by our collaborators or these third parties could impair the success of these field trials.

Many factors that may adversely affect the success of our field trials are beyond our control, including weather and climatic variations, such as drought or floods, severe heat or frost, hail, tornadoes and hurricanes, uncommon pests and diseases, or acts of protest or vandalism. For example, if there was prolonged or permanent disruption to the electricity, climate control, or water supply operating systems in our greenhouses or laboratories, the crops in which we or our collaborators are testing our traits and the samples we or our collaborators store in freezers, both of which are essential to our research and development activities, could be severely damaged or destroyed, adversely affecting these activities and thereby our business and results of operations. Unfavorable weather conditions can also reduce both acreage planted and incidence, or timing of, certain crop diseases or pest infestations, each of which may halt or delay our field trials. For example, in 2018, one of our trials was subjected to frost, as a result of which seed production and test results were compromised. We had to incur additional costs to repeat the trials in the following season. We have also experienced crop failures in the past for then-unknown reasons, causing delays in our achievement of milestones and delivery of results and necessitating that we repeat the impacted field trials. Any field test failure we may experience may not be covered by insurance and, therefore, could result in increased cost for the field trials and development of our traits, which may negatively impact our business and results of operations. Additionally, we are subject to USDA regulations, which may require us to abandon a field trial or to purchase and destroy neighboring crops that are planted after our field trials have commenced

Competition in traits and seeds 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 traits and agricultural biotechnology 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.

Our joint venture agreements could present a number of challenges that may have a material adverse effect on our business, financial condition, and results of operations.

Our joint venture, Archipelago creates a vertically integrated hemp supply chain, from seed to sale, to serve the Hawaiian, North American and Asian markets. We may enter into additional joint ventures in the future. Our joint venture arrangements may present financial, managerial, and operational challenges, including potential disputes, liabilities, or contingencies and may involve risks not otherwise present when operating independently, including:

- our joint venture partners may have business interests, goals or cultures that are or become inconsistent with our business interests, goals or culture;
- our joint venture partners may share certain approval rights,
- we may incur liabilities or losses as a result of an action taken by the joint venture or our joint venture partners;
- our joint venture partners may take action contrary to our instructions, requests, policies or objectives, which could reduce our return on investment, harm our reputation or restrict our ability to run our business; and
- disputes between us and our joint venture partners may result in delays, litigation or operational impasses.

The risks described above or the failure to continue any joint venture or joint development arrangement or to resolve disagreements with our current or future joint venture partners could materially and adversely affect our ability to transact the business that is the subject of such joint venture, which would in turn negatively affect our financial condition and results of operations.

We and our collaborators may disagree over our right to receive payments under our collaboration agreements, potentially resulting in costly litigation and loss of reputation.

Our ability to receive payments under our collaboration agreements depends on our ability to clearly delineate our rights under those agreements. We typically license our intellectual property to our collaborators, who then develop and commercialize seeds with improved traits. However, a collaborator may use our intellectual property without our permission, dispute our ownership of certain intellectual property rights, or argue that our intellectual property does not cover, or add value to, their marketed product. If a dispute arises, it may result in costly patent office procedures and litigation, and our collaborator may refuse to pay us while the dispute is ongoing. Furthermore, regardless of any resort to legal action, a dispute with a collaborator over intellectual property rights may damage our relationship with that collaborator and may also harm our reputation in the industry.

Even if we are entitled to payments from our collaborators, we may not actually receive these payments, or we may experience difficulties in collecting the payments to which we believe we are entitled. After our collaborators launch commercial products containing our licensed traits, we will need to rely on the good faith of our collaborators to report to us the sales they earn from these products and to accurately calculate the payments we are entitled to, a process that will involve complicated and difficult calculations. Although we seek to address these concerns in our collaboration agreements by reserving our right to audit financial records, such provisions may not be effective.

Our business is subject to various government regulations and if we or our collaborators are unable to timely complete the regulatory process for our products in development, our or our collaborators' ability to market our traits could be delayed, prevented or limited.

Our business is generally subject to two types of regulations: regulations that apply to how we and our collaborators operate and regulations that apply to products containing our traits. We apply for and maintain the regulatory permits necessary for our operations, particularly those covering our hemp seed breeding, seed production, and crop production operations or field trials, while we or our collaborators apply for and maintain regulatory approvals necessary for the commercialization of products containing our seed traits. The large-scale field trials that our collaborators conduct during advanced stages of product development are subject to regulations similar to those to which we are subject. Even if we and our collaborators make timely and appropriate applications for regulatory permits for our field trials, government delays in issuing such permits can significantly affect the development timelines for our products, particularly if the planting period for a crop growing season expires before the necessary permits are obtained. Pursuant to our collaboration agreements, our collaborators also apply for the requisite regulatory approvals prior to commercialization of products containing our traits. In most of our key target markets, regulatory approvals must be received prior to the importation of

genetically modified products. These regulatory processes may be complex; for example, the U.S. federal government's regulation of biotechnology is divided among the EPA, which regulates activity related to the use of plant pesticides and herbicides, the USDA, which regulates the import, field testing, interstate movement, and environmental release of specific technologies that may be used in the creation of genetically modified plants, and the FDA, which regulates foods derived from new plant varieties.

In addition to regulation by the U.S. government, products containing our biotech traits may be subject to regulation in each country in which such products are tested or sold. International regulations may vary from country to country and from those of the United States. The difference in regulations under U.S. law and the laws of foreign countries may be significant and, in order to comply with the laws of foreign countries, we may have to implement global changes to our products or business practices. Such changes may result in additional expense to us and either reduce or delay product development or sales. Additionally, we or our collaborators may be required to obtain certifications or approvals by foreign governments to test and sell the products in foreign countries.

The regulatory process is expensive and time-consuming, and the time required to complete the process is difficult to predict and depends upon numerous factors, including the substantial discretion of the regulatory authorities. Other than for our SONOVA products, neither we nor our collaborators have completed all phases of the regulatory process for any of our products in development. Our traits could require a significantly longer time to complete the regulatory process than expected, or may never gain approval, even if we and our collaborators expend substantial time and resources seeking such approval. A delay or denial of regulatory approval could delay or prevent our ability to generate revenues and to achieve profitability. Changes in regulatory review policies during the development period of any of our traits, changes in, or the enactment of, additional regulations or statutes, or changes in regulatory review practices for a submitted product application may cause a delay in obtaining approval or result in the rejection of an application for regulatory approval. Regulatory approval, if obtained, may be made subject to limitations on the indicated uses for which we or our collaborators may market a product. These limitations could adversely affect our potential revenues. Failure to comply with applicable regulatory requirements may, among other things, result in fines, suspensions of regulatory approvals, product recalls, product seizures, operating restrictions, and criminal prosecution. We have on certain occasions notified the USDA of instances of noncompliance with regulations. Although these occasions did not result in any enforcement actions, we may have occasions of noncompliance in the future that result in USDA or other governmental agency enforcement action.

Loss of or damage to our germplasm collection would significantly slow our product development efforts.

We have developed and maintain a comprehensive collection of germplasm through strategic collaborations with leading institutions, which we utilize in our non-GM programs. Germplasm comprises collections of genetic resources covering the diversity of a crop, the attributes of which are inherited from generation to generation. Germplasm is a key strategic asset since it forms the basis of seed development programs. To the extent that we lose access to such germplasm because of the termination or breach of our collaboration agreements, our product development capabilities would be severely limited. In addition, loss of or damage to these germplasm collections would significantly impair our research and development activities. Although we restrict access to our germplasm at our research facilities to protect this valuable resource, we cannot guarantee that our efforts to protect our germplasm collection will be successful. The destruction or theft of a significant portion of our germplasm collection would adversely affect our business and results of operations.

The regulatory environment outside the United States varies greatly from jurisdiction to jurisdiction and there is less certainty how some of our products will be regulated.

We may use gene-editing and TILLING technology to develop some of our product portfolio. The regulatory environment around gene-editing and TILLING in plants for food ingredients is greatly uncertain outside of the United States and varies greatly from jurisdiction to jurisdiction. Each jurisdiction may have its own regulatory framework regarding genetically modified foods, which may include restrictions and regulations on planting and growing genetically modified plants and in the consumption and labeling of genetically modified foods, and which may encapsulate our products. To the extent regulatory frameworks outside of the United States are not receptive to our gene-editing and TILLING technologies, this may limit our ability to expand into other global markets.

Complying with the regulatory requirements outside the United States will be costly and time-consuming, and there is no guarantee we will be able to commercialize our products outside the United States.

We cannot predict whether or when any jurisdiction will change its regulations with respect to our products. Advocacy groups have engaged in publicity campaigns and filed lawsuits in various countries against companies and regulatory authorities, seeking to halt regulatory approval or clearance activities or influence public opinion against genetically engineered and/or gene-edited products. In addition, governmental reaction to negative publicity concerning our products could result in greater regulation of genetic research and derivative products or regulatory costs that render our products cost prohibitive.

The scale of the commodity food industry may make it difficult to monitor and control the distribution of our products. As a result, our products may be sold inadvertently within jurisdictions where they are not approved for distribution. Such sales may lead to regulatory challenges or lawsuits against us, which could result in significant expenses and management attention.

We depend on our key personnel and, if we are not able to attract and retain qualified scientific 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 scientific 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 research, 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 molecular biology, biochemistry, plant genetics, agronomics, mathematics, agribusiness, 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 headquarters, certain research and development operations and our seed storage warehouse are located in Davis, California. Production of hemp and wheat is conducted in California, Hawaii, Oregon, Idaho and other locations. 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. Our SONOVA product inventory is stored in a single cold storage facility in Northern California. 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.

A lack of availability of water in any of our production areas could impact our business.

Adequate quantities and correct timing of the application of water are vital for most agriculture to thrive. Whether particular farms are experiencing water shortages depends, in large part, on their location. However, continuing drought conditions can threaten all farmland other than those properties with their own water sources. Domestic regulations regarding water usage and rights may also limit the availability of water. Moreover, if the farmers and others who purchase our seed to grow crops cannot get an adequate supply of water, or if the cost of water makes it uneconomical for the farmers to grow the crops, we may not be able to sell our seed, which could have an adverse impact on our results of operations.

Disruption to our IT system could adversely affect our reputation and have a material adverse effect on our business and results of operations.

Our technologies rely on our IT system to collect and analyze our genomic data, including TILLING and other experimental data, and manage our plant inventory system, which tracks every plant that we have ever produced. We can provide no assurance that our current IT system is fully protected against third-party intrusions, viruses, hacker attacks, information, or data theft, or other similar threats. Furthermore, we store significant amounts of data and, though we have back-up storage for our stored data, we cannot assure you that our back-up storage arrangements will be effective if it becomes necessary to rely on them.

If our IT system does not function properly or proves incompatible with new technologies, we could experience interruptions in data transmissions and slow response times, preventing us from completing routine research and business activities. Furthermore, disruption or failure of our IT system due to technical reasons, natural disaster, or other unanticipated catastrophic events, including power interruptions, storms, fires, floods, earthquakes, terrorist attacks, and wars could significantly impair our ability to deliver data related to our projects to our collaborators on schedule and materially and adversely affect the outcome of our collaborations, our relationships with our collaborators, our business, and our results of operations.

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 business model for discovery of genes is dependent on licensing patent rights from third parties, and any disruption of this licensing process could adversely affect our competitive position and business prospects.

Our business model involves acquiring technologies that have achieved proof of concept through rigorous development and testing by third-party basic researchers in order to avoid the significant risks and high costs associated with basic research. Only a small number of the genes we evaluate for acquisition are likely to provide viable commercial candidates and an even more limited number, if any, are likely to be commercialized by us or our collaborators. A failure by us to continue identifying genes that improve specific crop traits could make it difficult to grow our business. If we are unable to identify additional genes, we may be unable to develop new traits, which may negatively impact our ability to generate revenues.

If we are unable to enter into licensing arrangements to acquire rights to these potentially viable genes on favorable terms in the future, it may adversely affect our business. In addition, if the owners of the patents we license do not properly maintain or enforce the patents underlying such licenses, our competitive position and business prospects could be harmed. Without protection for the intellectual property we license, other companies might be able to offer substantially similar or identical products for sale, which could adversely affect our competitive business position and harm our business prospects.

If we fail to comply with our obligations under license agreements, our counterparties may have the right to terminate these agreements, in which event we may not be able to develop, manufacture, register, or market, or may be forced to cease developing, manufacturing, registering, or marketing, any product that is covered by these agreements or may face other penalties under such agreements. Such an occurrence could materially adversely affect the value of the applicable products to us and have an adverse effect on our business and result of operations.

We are subject to the risk of becoming an investment company under the Investment Company Act of 1940.

On November 12, 2020, we acquired 1,875,000 shares of common stock of Bioceres Crop Solutions Corp. (“Biox Shares”) in connection with the sale of our membership interest in Verdeca, LLC to Bioceres, Inc. and our licensing of certain technology to Bioceres Inc. Our ownership of the Biox Shares could subject us to regulation under the Investment Company Act of 1940 (the “Investment Company Act”).

Section 3(a)(1)(C) of the Investment Company Act defines an investment company as any issuer that “is engaged or proposes to engage in the business of investing, reinvesting, owning, holding or trading in securities, and owns or proposes to acquire investment securities having a value exceeding 40% of the value of such issuer’s total assets (exclusive of U.S. government securities and cash items)” (the “40% Threshold”). While we do not intend to engage primarily in the business of investing, reinvesting, owning, holding or trading in investment securities, the value of the Biox Shares relative to our other assets could change over time and cause us to exceed the 40% Threshold. Rule 3a-2 under the Investment Company Act provides one-year relief from the registration requirements of the Investment Company Act to an issuer that, on a transient basis, is deemed to be an investment company. The transient investment company exemption is available to a company no more than once every three years. If we exceed the 40% Threshold because our ownership of the Biox Shares, we will need to dispose of a sufficient amount of the Bios Shares in order to Company with the Investment Company act. Such disposal of the Biox Shares may be on terms that are unfavorable to us and could adversely impact our financial position and results of operations.

If we are unable to comply with Rule 3a-2 and are deemed to be an investment company, the consequences of failing to register under the Investment Company Act would be significant. For example, investment companies that fail to register under the Investment Company Act are prohibited from conducting business in interstate commerce. The ramifications of registering as an investment company, both in terms of the restrictions imposed on us and the cost of compliance, would be significant. For example, in addition to expenses related to initially registering as an investment company, the Investment Company Act also would impose various restrictions with regard to our ability to enter into affiliated transactions, the diversification of our assets, and our ability to

borrow money. If we became subject to the Investment Company Act at some point in the future, our ability to continue pursuing our business plan would be severely limited.

Our ownership of the Biox Shares could cause the value of our assets and our results of operation to vary significantly.

The value of the Biox Shares on our balance sheet will be based upon the market value of the Biox Shares as of the end of each quarter. As the Biox Shares trade on the NYSE American stock exchange, their value is subject to fluctuation over time. This fluctuation could be significant, which would materially affect our total assets and results of operations from quarter to quarter, independent of the performance of our core business.

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 are unable to protect the confidentiality of our trade secrets, the value of our technology could be materially and adversely affected and our business could be harmed.

We treat our proprietary technologies, including unpatented know-how and other proprietary information, as trade secrets. We seek to protect these trade secrets, in part, by entering into non-disclosure and confidentiality agreements with any third parties who have access to them, such as our consultants, independent contractors, advisors, corporate collaborators, and outside scientific collaborators. We also enter into confidentiality and invention or patent assignment agreements with employees and certain consultants. Any party with whom we have executed such an agreement could breach that agreement and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive, and time consuming, and the outcome is unpredictable. In addition, if any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent such third party, or those to whom they communicate such technology or information, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, or if we otherwise lose protection for our trade secrets or proprietary know-how, the value of this information may be greatly reduced and our business and competitive position could be harmed.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing our ability to protect our products in development.

As an agricultural biotechnology company, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents involves technological and legal complexity, and is costly, time consuming, and inherently uncertain. In addition, the U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the U.S. Patent and Trademark Office, the laws and regulations governing patents could change in unpredictable ways that may weaken or undermine our ability to obtain new patents or to enforce our existing patents and patents we might obtain in the future.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting, maintaining, and defending patents on products in development in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States are less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. For example, several countries outside the United States prohibit patents on plants and seeds entirely. In addition, we may at times license third-party technologies for which limited international patent protection exists and for which the time period for filing international patent applications has passed. Consequently, we are unable to prevent third parties from using intellectual property we develop or license in all countries outside the United States, or from selling or importing products made using our intellectual property in and into the jurisdictions in which we do not have patent protection. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products, and we may be unable to prevent such competitors from importing those infringing products into territories where we have patent protection, but where enforcement is not as strong as in the United States. These products may compete with our products in development and our patents and other intellectual property rights may not be effective or sufficient to prevent them from competing in those jurisdictions. Moreover, farmers or others in the chain of commerce may raise legal challenges to our intellectual property rights or may infringe upon our intellectual property rights, including through means that may be difficult to prevent or detect, and local regulators may choose to not enforce our intellectual property rights.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions where we have filed patent applications. The legal systems of certain countries have not historically favored the enforcement of patents or other intellectual property rights, which could hinder us from preventing the infringement of our patents or other intellectual property rights and result in substantial risks to us. Proceedings to enforce our patent rights in the United States or foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert patent infringement or other claims against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful or even cover our associated legal costs. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license from third parties.

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.

We are subject to anti-corruption and anti-money laundering laws with respect to both our domestic and international operations, and non-compliance with such laws can subject us to criminal and civil liability and harm our business.

We are subject to the U.S. Foreign Corrupt Practices Act of 1977, as amended, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, and possibly other anti-bribery and anti-money laundering laws in countries in which we conduct activities. Anti-corruption laws are interpreted broadly and prohibit us and our collaborators from authorizing, offering, or directly or indirectly providing improper payments or benefits to recipients in the public or private sector. We or our collaborators may have direct and indirect interactions with government agencies and state-affiliated entities and universities in the course of our business. We may also have certain matters come before public international organizations such as the United Nations. We use third-party collaborators, joint venture and strategic partners, law firms, and other representatives for regulatory compliance, patent registration, lobbying, deregulation advocacy, field testing, and other purposes in a variety of countries, including those that are known to present a high corruption risk such as India, China, and Latin American countries. We can be held liable for the corrupt or other illegal activities of these third-party collaborators, our employees, representatives, contractors, partners, and agents, even if we do not explicitly authorize such activities. In addition, although we have implemented policies and procedures to ensure compliance with anti-corruption and related laws, there can be no assurance that all of our employees, representatives, contractors, partners, or agents will comply with these laws at all times. Noncompliance with these laws could subject us to whistleblower complaints, investigations, sanctions, settlements, prosecution, other enforcement actions, disgorgement of profits, significant fines, damages, other civil and criminal penalties or injunctions, suspension and debarment from contracting with certain governments or other persons, the loss of export privileges, reputational harm, adverse media coverage, and other collateral consequences. If any subpoenas or investigations are launched, or governmental or other sanctions are imposed, or if we do not prevail in any possible civil or criminal litigation, our business, results of operations, and financial condition could be materially harmed. In addition, responding to any action will likely result in a materially significant diversion of management's attention and resources and significant defense costs and other professional fees. Enforcement actions and sanctions could further harm our business, results of operations, and financial condition.

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 SONOVA and GoodWheat products, and as additional products integrating our traits reach commercialization, product liability claims will increasingly be a commercial risk for our business, particularly as we are involved in the supply of biotechnological products, some of which may be harmful to humans and the environment. 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 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.

We incur significant costs and devote substantial management time as a result of operating as a public company.

As a public company, we incur significant legal, accounting, and other expenses. For example, we are subject to the reporting requirements of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and are required to comply with the applicable requirements of the Sarbanes-Oxley Act and the Dodd-Frank Wall Street Reform and Consumer Protection Act, as well as rules and regulations subsequently implemented by the SEC and The Nasdaq Stock Market, including the establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Compliance with these requirements has increased and will continue to increase our legal and financial compliance costs and has made and will continue to make some activities more time consuming and costly. Our management and other personnel have had to, and will continue to, divert attention from operational and other business matters to devote substantial time to these public company requirements, which could adversely affect our business, financial condition, and operating results.

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. As an emerging growth company under the JOBS Act, we are currently exempt from the auditor attestation requirement of Section 404(b). If we lose this eligibility, we will incur increased personnel and audit fees in connection with the additional audit requirements.

In connection with the preparation of our financial statements for the years ended December 31, 2019 and 2018, 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 June 2018 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, 2019, there were 8,646,149 shares of our common stock outstanding, of which approximately 7,020,477 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 410,270 options exercisable as of December 31, 2019 at a weighted average exercise price of \$29.24.

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 \$2.65 to \$176.00, through December 31, 2019. 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' research, development, and regulatory activities;
- the impact of seasonality in agricultural operations on our field trials and sales of products, including those that incorporate our seed traits;
- supplier, manufacturing, or quality problems; and
- variance in the timing of customer and distributor orders for our products.

Further, a large proportion of our costs are fixed, due in part to our significant research and development costs and general and administrative expenses. Thus, even a small decline in revenues could disproportionately affect our quarterly operating results and could cause such results to differ materially from expectations. 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.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws might discourage, delay or prevent a change of control of our company or changes in our management and, therefore, depress the trading price of our common stock.

Our amended and restated certificate of incorporation and amended and restated bylaws contain provisions that could depress the trading price of our common stock by discouraging, delaying or preventing a change of control of our company or changes in our management that the stockholders of our company may believe advantageous. These provisions include:

- establishing a classified board of directors so that not all members of our board of directors are elected at one time;
- authorizing "blank check" preferred stock that our board of directors could issue to increase the number of outstanding shares to discourage a takeover attempt;
- eliminating the ability of stockholders to call a special stockholder meeting;
- eliminating the ability of stockholders to act by written consent;
- the requirement that, to the fullest extent permitted by law and unless we consent to an alternate form, certain proceedings against or involving us or our directors, officers, or employees be brought exclusively in the Court of Chancery in the State of Delaware;
- providing that the board of directors is expressly authorized to make, alter, or repeal our bylaws; and
- establishing advance notice requirements for nominations for elections to our board of directors or for proposing matters that can be acted upon by stockholders at stockholder meetings.

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.

SELLING STOCKHOLDERS

The selling stockholders named in the table below may from time to time offer and sell pursuant to this prospectus and any applicable prospectus supplements up to 12,209,015 shares of our Common Stock.

Private Placement

On January 25, 2021, we entered into a securities purchase agreement with certain institutional and accredited investors relating to the issuance and sale in a private placement of 7,876,784 shares (“Shares”) of our common stock at a purchase price of \$3.1925 per share and warrants (the “Investor Warrants”) exercisable for an aggregate of 3,938,392 shares of Common Stock (the “Investor Warrant Shares”) with an exercise price of \$3.13 per Investor Warrant Share (the “Private Placement”). Subject to certain ownership limitations, the Investor Warrants are exercisable upon issuance and will expire on the 5.5 year anniversary of the date of issuance. The Private Placement closed on January 28, 2021.

Also on January 25, 2021 and in connection with the Private Placement, we entered into a registration rights agreement (the “Registration Rights Agreement”) with the investors in the Private Placement. Pursuant to the Registration Rights Agreement, we agreed to prepare and file with the SEC a registration statement on Form S-3 by February 2, 2021 for purposes of registering the resale of the Shares and Warrant Shares. We also agreed to use our best efforts to cause this registration statement to be declared effective by the SEC by March 26, 2021 (April 23, 2021 in the event the registration statement is reviewed by the SEC). If we fail to meet the specified filing deadlines or keep the registration statement effective, subject to certain permitted exceptions, we will be required to pay liquidated damages to the investors.

H.C. Wainwright & Co., LLC (“Wainwright”) acted as the exclusive placement agent for the Private Placement. Pursuant to an engagement letter, dated December 17, 2020, we issued to designees of Wainwright warrants (“Wainwright Warrants”, and together with the Investor Warrants, the “Warrants”) to purchase a total of 393,839 shares of our common stock (“Wainwright Warrant Shares”, and together with the Investor Warrant Shares, the “Warrant Shares”) at an exercise price per share of \$3.99. The Wainwright Warrants are exercisable for five years from the date of issuance.

The Shares and the shares underlying the Warrants are being registered for resale hereunder.

Relationships with the Selling Stockholders

Sabby Volatility Warrant Master Fund, Ltd. (“Sabby”) was an investor in our private placement offering that closed on March 22, 2018 (the “March 2018 Offering”), pursuant to which we issued and sold an aggregate of 1,201,634 shares of our common stock for approximately \$10 million and warrants to purchase a total of 1,282,832 shares of our common stock at an exercise price of \$10.7258 per share (the “March 2018 Warrants”).

Sabby, CVI Investments, Inc. (“CVI”) and Intracoastal Capital, LLC (“Intracoastal”) were investors in our registered direct offering and concurrent private placement of warrants that closed on June 14, 2018 (the “June 2018 Offering”), pursuant to which we issued and sold in a registered direct offering an aggregate of 1,392,345 shares of our common stock at an offering price of \$10.055 per share. In a concurrent private placement, we issued to the investors, for each share of common stock purchased in the offering, a warrant to purchase one share of common stock (the “June 2018 Warrants”). The June 2018 Warrants have an exercise price of \$9.94 per share and are exercisable to purchase an aggregate of up to 1,392,345 shares of our common stock.

CVI, Intracoastal, Anson Investments Master Fund LP (“Anson”) and Armistice Capital Master Fund, Ltd. (“Armistice”) were investors in our registered direct offering and concurrent private placement of warrants that closed on June 14, 2019 (the “June 2019 Offering”), pursuant to which we issued and sold in a registered direct offering an aggregate of 1,489,575 shares of our common stock at an offering price of \$5.035 per share. In a concurrent private placement, we issued to the investors, for each share of common stock purchased in the offering, a warrant to purchase one share of common stock. These warrants have an exercise price of \$5.00 per share and are exercisable to purchase an aggregate of up to 1,489,575 shares of our common stock.

Armistice and Anson were investors in our registered direct offering and concurrent private placement of warrants that closed on September 10, 2019 (the “September 2019 Offering”), pursuant to which we issued and sold in a registered direct offering an aggregate of 1,318,828 shares of our common stock at an offering price of \$7.5825 per share. In a concurrent private placement, we issued to the investors, for each share of common stock purchased in the offering, a warrant to purchase one share of common stock. These warrants have an exercise price of \$7.52 per share and are exercisable to purchase an aggregate of up to 659,414 shares of our common stock.

Intracoastal, Sabby and CVI were investors in our warrant exercise transaction that closed on May 18, 2020 (the “May 2020 Offering”), pursuant to which certain holders of the June 2018 Warrants exercised 1,392,345 of these warrants at a reduced exercise price per share of \$4.90 and were issued new warrants to purchase a total of 1,392,345 shares of our common stock at an exercise price per share of \$4.775.

Sabby was an investor in our warrant exercise transaction that closed on July 8, 2020 (the “July 2020 Offering”), pursuant to which Sabby exercised 641,416 March 2018 Warrants at a reduced exercise price per share of \$3.975 and was issued new warrants to purchase a total of 641,416 shares of our common stock (“July 2020 Warrants”) at an exercise price per share of \$3.85.

Intracoastal, Armistice, FiveTCapital AG/FiveT Investment Management Ltd., Alpha Capital Anstalt, Cavalry Fund I LP, Cavalry Special Ops Fund, LLC, Brio Capital Master Fund, Ltd. and Iroquois Capital Investment Group LLC were investors in our registered direct offering and concurrent private placement of warrants that closed on December 18, 2020 (the “December 2020 Offering”), pursuant to which we issued and sold in a registered direct offering an aggregate of 2,618,658 shares of our common stock at an offering price of \$3.055 per share. In a concurrent private placement, we issued to the investors, for each share of common stock purchased in the offering, a warrant to purchase one share of common stock. These warrants have an exercise price of \$3.00 per share and are exercisable to purchase an aggregate of up to 2,618,658 shares of our common stock.

Each of Michael Vasinkevich, Noam Rubinstein, Craig Schwabe and Charles Worthman are affiliated with Wainwright. Wainwright served as our placement agent in several offerings of our securities within the past three years, including the March 2018 Offering, the June 2018 Offering, the June 2019 Offering, the September 2019 Offering, the May 2020 Offering, the July 2020 Offering and the December 2020 Offering, for which it received cash and warrant compensation. In connection with all of the offerings HCW served as a placement agent, each of Michael Vasinkevich, Noam Rubinstein, and Charles Worthman, as a designee of Wainwright, has received warrants to purchase shares of our common stock. In connection with the May 2020 Offering, the July 2020 Offering and the December 2020 Offering, Craig Schwabe, as a designee of Wainwright, received warrants to purchase shares of our common stock.

Except with respect to the foregoing, none of the selling stockholders has, or within the past three years has had, any position, office or other material relationship with us.

Information About Selling Stockholder Offering

The shares of Common Stock being offered by the selling stockholders are those previously issued to the selling stockholders, and those issuable to the selling stockholders, upon the exercise of the Warrants. For additional information regarding the issuances of those shares of Common Stock, see “—Private Placement” above. We are registering the shares of Common Stock in order to permit the selling stockholders to offer the shares for resale from time to time.

The table below lists the selling stockholders and other information regarding the ownership of the shares of Common Stock by each of the selling stockholders. The second column lists the number of shares of Common Stock owned by each selling stockholder, based on its ownership of the shares of Common Stock and securities convertible into shares of Common Stock, as of January 28, 2021, assuming exercise of the securities convertible into shares of Common Stock held by the selling stockholders on that date, without regard to any limitations on exercises.

The third column lists the shares of Common Stock being offered by this prospectus by the selling stockholders.

In accordance with the terms of the Registration Rights Agreement, this prospectus generally covers the resale of the sum of (i) the Shares issued to the selling stockholders in the “—Private Placement” described above and (ii) the maximum number of Warrant Shares issuable upon exercise of the Warrants. The table below assumes that the outstanding Warrants were exercised in full as of the trading day immediately preceding the date this registration statement was initially filed with the SEC, each as of the trading day immediately preceding the applicable date of determination, without regard to any limitations on the exercise of the Warrants. The fourth column assumes the sale of all of the shares offered by the selling stockholders pursuant to this prospectus. The fifth column lists the percentages of shares of Common Stock owned by the selling stockholders after this offering, taking account of any limitations on exercise set forth in the applicable convertible securities.

Under the terms of the Warrants, a selling stockholder may not exercise the Warrants to the extent such exercise would cause such selling stockholder, together with its affiliates and attribution parties, to beneficially own a number of shares of Common Stock which would exceed 4.99% or 9.99%, as applicable, of our then outstanding Common Stock following such exercise, excluding for purposes of such determination shares of Common Stock issuable upon the exercise of the Warrants, which have not been exercised. The number of shares in the second column does not reflect this limitation. The selling stockholders may sell all, some or none of their

shares in this offering. See “Plan of Distribution.” The total number of outstanding shares of common stock as of January 28, 2021 was 21,327,645.

Name of Selling Stockholder	Number of shares of Common Stock Owned Prior to Offering	Shares to be Sold in this Offering	Shares Beneficially Owned After Offering	
			Number	Percentage
Sabby Volatility Warrant Master Fund, Ltd. (1)	1,980,848	939,702	1,041,146	4.65%
FiveT Capital Holding AG/FiveT Investment Management Ltd. (2)	2,103,525	1,503,525	600,000	2.74%
Empery Asset Master, LTD (3)	925,512	925,512	-	-
Empery Tax Efficient, LP (4)	247,821	247,821	-	-
Empery Tax Efficient III, LP (5)	326,667	326,667	-	-
3i, LP (6)	939,750	939,750	-	-
Anson Investments Master Fund LP (7)	968,544	704,778	263,766	1.22%
Anson East Master Fund LP (8)	234,927	234,927	-	-
BPY Limited (9)	375,879	375,879	-	-
Nomis Bay Ltd. (10)	563,823	563,823	-	-
Lind Global Macro Fund, LP (11)	704,778	704,778	-	-
Alto Opportunity Master Fund, SPC – Segregated Master Portfolio B (12)	469,851	469,851	-	-
Alpha Capital Anstalt (13)	674,723	352,389	322,334	1.50%
The Hewlett Fund LP (14)	281,913	281,913	-	-
Brio Capital Master Fund Ltd. (15)	548,261	234,927	313,334	1.46%
Kingsbrook Opportunities Master Fund LP (16)	46,986	46,986	-	-
Boothbay Absolute Return Strategies LP (17)	124,491	124,491	-	-
Boothbay Diversified Alpha Master Fund, LP (18)	63,450	63,450	-	-
Iroquois Capital Investment Group LLC (19)	95,029	70,479	24,550	*
Iroquois Master Fund Ltd. (20)	164,448	164,448	-	-
MMCAP International Inc. SPC (21)	234,927	234,927	-	-
Cavalry Fund I LP (22)	140,564	58,731	81,833	*
Cavalry Special Ops Fund, LLC (23)	140,565	58,731	81,834	*
Hamilton Stuart Capital (24)	46,986	46,986	-	-
CVI Investments, Inc. (25)	1,755,865	1,200,000	555,865	2.54%
Intracoastal Capital, LLC (26)	1,685,029	939,705	745,324	3.38%
Michael Vasinkevich (27)	547,345	252,550	294,795	1.36%
Noam Rubinstein (28)	268,233	124,059	144,174	*
Craig Schwabe (29)	21,143	13,292	7,851	*
Charles Worthman (30)	8,514	3,938	4,576	*

* Represents beneficial ownership of less than one percent.

- (1) Shares beneficially owned before the offering includes 1,352,462 shares of common stock issuable upon exercise of warrants, including 313,234 shares underlying the Warrants that are being offered pursuant to this prospectus. Sabby Management, LLC is the investment manager of Sabby Volatility Warrant Master Fund, Ltd. and shares voting and investment power with respect to these shares in this capacity. As manager of Sabby Management, LLC, Hal Mintz also shares voting and investment power on behalf of Sabby Volatility Warrant Master Fund, Ltd. Each of Sabby Management, LLC and Hal Mintz disclaims beneficial ownership over the securities listed except to the extent of their pecuniary interest therein. The address of principal business office of Sabby Volatility Warrant Master Fund, Ltd., Sabby Management, LLC and Hal Mintz is 10 Mountainview Road, Suite 205, Upper Saddle River, New Jersey 07458. Sabby Volatility Warrant Master Fund, Ltd. is not a registered broker-dealer or an affiliate of a registered broker-dealer.
- (2) Shares beneficially owned before the offering includes 1,101,175 shares of common stock issuable upon exercise of warrants, including 501,175 shares underlying the Warrants that are being offered pursuant to this prospectus. Johannes Minho Roth has sole voting and dispositive power over the securities held for the account of this selling stockholder. The selling stockholder’s address is Allmendstrasse 140, 8041 Zurich, Switzerland.
- (3) Includes 308,504 shares underlying the Warrants. Empery Asset Management LP, the authorized agent of Empery Asset Master Ltd (“EAM”), has discretionary authority to vote and dispose of the shares held by EAM and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by EAM. EAM, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares. The selling stockholder’s address is c/o Empery Asset Management, LP, 1 Rockefeller Plaza, Suite 1205, New York, NY 10020.
- (4) Includes 82,607 shares underlying the Warrants. Empery Asset Management LP, the authorized agent of Empery Tax Efficient, LP (“ETE”), has discretionary authority to vote and dispose of the shares held by ETE and may be deemed to be the beneficial

- owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by ETE. ETE, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares. The selling stockholder's address is c/o Empery Asset Management, LP, 1 Rockefeller Plaza, Suite 1205, New York, NY 10020.
- (5) Includes 108,889 shares underlying the Warrants. Empery Asset Management LP, the authorized agent of Empery Tax Efficient III, LP ("ETE III"), has discretionary authority to vote and dispose of the shares held by ETE III and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by ETE III. ETE III, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares. The selling stockholder's address is c/o Empery Asset Management, LP, 1 Rockefeller Plaza, Suite 1205, New York, NY 10020.
 - (6) Includes 313,250 shares underlying the Warrants. Maier J. Tarlow has sole voting and dispositive power with respect to the shares of common stock held by 3i, LP. The address of 3i, LP is 3i Fund, 140 Broadway 38 FL, New York, New York 10005.
 - (7) Shares beneficially owned before the offering includes 498,692 shares of common stock issuable upon exercise of warrants, including 234,926 shares underlying the Warrants that are being offered pursuant to this prospectus. Anson Advisors Inc and Anson Funds Management LP, the Co-Investment Advisers of Anson Investments Master Fund LP ("Anson Investments"), hold voting and dispositive power over the securities held by Anson Investments. Bruce Winson is the managing member of Anson Management GP LLC, which is the general partner of Anson Funds Management LP. Moez Kassam and Amin Nathoo are directors of Anson Advisors Inc. Mr. Winson, Mr. Kassam and Mr. Nathoo each disclaim beneficial ownership of these securities except to the extent of their pecuniary interest therein. The principal business address of Anson Investments is Walkers Corporate Limited, Cayman Corporate Centre, 27 Hospital Road, George Town, Grand Cayman KY1-9008, Cayman Islands.
 - (8) Includes 78,309 shares underlying the Warrants. Anson Advisors Inc and Anson Funds Management LP, the Co-Investment Advisers of Anson East Master Fund LP ("Anson East"), hold voting and dispositive power over the securities held by Anson East. Bruce Winson is the managing member of Anson Management GP LLC, which is the general partner of Anson Funds Management LP. Moez Kassam and Amin Nathoo are directors of Anson Advisors Inc. Mr. Winson, Mr. Kassam and Mr. Nathoo each disclaim beneficial ownership of these Common Shares except to the extent of their pecuniary interest therein. The principal business address of Anson East is Walkers Corporate Limited, Cayman Corporate Centre, 27 Hospital Road, George Town, Grand Cayman KY1-9008, Cayman Islands.
 - (9) Includes 125,293 shares underlying the Warrants. Peter Poole is the natural person with voting and dispositive power over the shares held by the selling stockholder. The address for BPY Limited is 45 Reid Street, Wessex House, Hamilton, Bermuda HM12.
 - (10) Includes 187,941 shares underlying the Warrants. Peter Poole is the natural person with voting and dispositive power over the shares held by the selling stockholder. The address for Nomis Bay Ltd. is 45 Reid Street, Wessex House, Hamilton, Bermuda HM12.
 - (11) Includes 234,926 shares underlying the Warrants. Jeff Easton is the Managing Member of Lind Global Partners, LLC, which is the General Partner of Lind Global Macro Fund, LP, and in such capacity has the right to vote and dispose of the securities held by such entity. Mr. Easton disclaims beneficial ownership over the securities listed except to the extent of his pecuniary interest therein. The address for Lind Global Macro Fund, LP is 444 Madison Avenue, 41st Floor, New York, NY 10022.
 - (12) Includes 156,617 shares underlying the Warrants. Ayrton Capital LLC, the investment manager to Alto Opportunity Master Fund, SPC – Segregated Master Portfolio B, ("Alto Opportunity Master Fund B"), has discretionary authority to vote and dispose of the shares held by Alto Opportunity Master Fund B and may be deemed to be the beneficial owner of these shares. Waqas Khatri, in his capacity as managing member of Ayrton Capital LLC, may also be deemed to have investment discretion and voting power over the shares held by Alto Opportunity Master Fund B. Ayrton Capital LLC and Mr. Khatri disclaim any beneficial ownership of these shares. The address of Ayrton Capital, LLC is 55 Post Rd West, 2nd Floor, Westport, CT 06880.
 - (13) Shares beneficially owned before the offering includes 281,130 shares of common stock issuable upon exercise of warrants, including 117,463 shares underlying the Warrants that are being offered pursuant to this prospectus. Konrad Ackermann has voting and dispositive power over the securities held for the account of this selling stockholder. The selling stockholder's address is Lettstrasse 32, 9490 Vaduz, Principality of Liechtenstein.
 - (14) Includes 93,971 shares underlying the Warrants. Martin Chopp is the natural person that holds voting and dispositive power with respect to the shares held by The Hewlett Fund LP. The selling securityholder's address is 100 Merrick Road, Suite 400W, Rockville Centre, New York 11570.
 - (15) Shares beneficially owned before the offering includes 241,976 shares of common stock issuable upon exercise of warrants, including 78,309 shares underlying the Warrants that are being offered pursuant to this prospectus. Shaye Hirsch, as Director of Brio Capital Master Fund Ltd., has the power to vote and dispose of the shares held by Brio Capital Master Fund Ltd. and may be deemed to be the beneficial owner of these shares. The address for Brio Capital Master Fund Ltd. is c/o Brio Capital Management LLC, 100 Merrick Road, Suite 401W, Rockville Centre, New York 11570.
 - (16) Includes 15,662 shares underlying the Warrants. Kingsbrook Partners LP ("Kingsbrook Partners") is the investment manager of Kingsbrook Opportunities Master Fund LP ("Kingsbrook Opportunities") and consequently has voting control and investment discretion over securities held by Kingsbrook Opportunities. Kingsbrook Opportunities GP LLC ("Opportunities GP") is the general partner of Kingsbrook Opportunities and may be considered the beneficial owner of any securities deemed to be beneficially owned by Kingsbrook Opportunities. KB GP LLC ("GP LLC") is the general partner of Kingsbrook Partners and may be considered the beneficial owner of any securities deemed to be beneficially owned by Kingsbrook Partners. Ari J.

- Storch, Adam J. Chill and Scott M. Wallace are the sole managing members of Opportunities GP and GP LLC and as a result may be considered beneficial owners of any securities deemed beneficially owned by Opportunities GP and GP LLC. Each of Kingsbrook Partners, Opportunities GP, GP LLC and Messrs. Storch, Chill and Wallace disclaim beneficial ownership of these securities. The address of Kingsbrook Opportunities Master Fund LP is c/o Kingsbrook Partners LP, 689 Fifth Avenue, 12th Floor, New York, New York 10022.
- (17) Includes 21,150 shares underlying the Warrants. Boothbay Absolute Return Strategies LP, a Delaware limited partnership (the “Absolute Fund”), is managed by Boothbay Fund Management, LLC, a Delaware limited liability company (the “Adviser”). The Adviser, in its capacity as the investment manager of the Absolute Fund, has the power to vote and the power to direct the disposition of all securities held by the Absolute Fund. Ari Glass is the Managing Member of the Adviser. Each of the Absolute Fund, the Adviser and Mr. Glass disclaim beneficial ownership of these securities, except to the extent of any pecuniary interest therein. The address of Boothbay Absolute Return Strategies LP is c/o Boothbay Fund Management, LLC, 140 East 45th Street, 14th Floor, New York, NY 10017.
- (18) Includes 41,497 shares underlying the Warrants. Boothbay Diversified Alpha Master Fund, LP, a Cayman Islands limited partnership (the “Diversified Fund”), is managed by Boothbay Fund Management, LLC, a Delaware limited liability company (the “Adviser”). The Adviser, in its capacity as the investment manager of the Diversified Fund, has the power to vote and the power to direct the disposition of all securities held by the Diversified Fund. Ari Glass is the Managing Member of the Adviser. Each of the Diversified Fund, the Adviser and Mr. Glass disclaim beneficial ownership of these securities, except to the extent of any pecuniary interest therein. The address of Boothbay Diversified Alpha Master Fund, LP is c/o Boothbay Fund Management, LLC, 140 East 45th Street, 14th Floor, New York, NY 10017.
- (19) Shares beneficially owned before the offering includes 48,043 shares of common stock issuable upon exercise of warrants, including 23,493 shares underlying the Warrants that are being offered pursuant to this prospectus. Richard Abbe is the natural person with voting and dispositive power over the shares held by Iroquois Capital Investment Group LLC. The selling stockholder’s address is 125 Park Avenue, 25th Floor, New York, New York 10017.
- (20) Includes 54,816 shares underlying the Warrants. Richard Abbe is the natural person with voting and dispositive power over the shares held by Iroquois Master Fund Ltd. The selling stockholder’s address is 125 Park Avenue, 25th Floor, New York, New York 10017.
- (21) Includes 78,309 shares underlying the Warrants. Voting and dispositive powers are exercised by Matthew MacIsaac, Secretary, MM Asset Management Inc., investment advisor to the selling stockholder. The selling stockholder’s address is c/o Mourant Governance Services (Cayman) Limited, 94 Solaris Avenue, Camana Bay, P.O. Box 1348, Grand Cayman, Cayman Islands KY1-1008.
- (22) Shares beneficially owned before the offering includes 101,410 shares of common stock issuable upon exercise of warrants, including 19,577 shares underlying the Warrants that are being offered pursuant to this prospectus. Thomas Walsh has sole voting and dispositive power with respect to the shares of common stock held by Cavalry Fund I LP. The address of Cavalry Fund I LP is 82 E. Allendale Road, Suite 5B, Saddle River, New Jersey 07458.
- (23) Shares beneficially owned before the offering includes 101,411 shares of common stock issuable upon exercise of warrants, including 19,577 shares underlying the Warrants that are being offered pursuant to this prospectus. Thomas Walsh has sole voting and dispositive power with respect to the shares of common stock held by Cavalry Special Ops Fund, LLC. The address of Cavalry Special Ops Fund, LLC is 82 E. Allendale Road, Suite 5B, Saddle River, New Jersey 07458.
- (24) Includes 15,662 shares underlying the Warrants. The address of the selling stockholder is 101 Wigmore Street, 5th Floor, London, Greater London W1U 1QU.
- (25) Shares beneficially owned before the offering includes 955,865 shares of common stock issuable upon exercise of warrants, including 400,000 shares underlying the Warrants that are being offered pursuant to this prospectus. Heights Capital Management, Inc., the authorized agent of CVI Investments, Inc. (“CVI”), has discretionary authority to vote and dispose of the shares held by CVI and may be deemed to be the beneficial owner of these shares. Martin Kobinger, in his capacity as Investment Manager of Heights Capital Management, Inc., may also be deemed to have investment discretion and voting power over the shares held by CVI. Mr. Kobinger disclaims any such beneficial ownership of the shares. CVI is affiliated with one or more FINRA members, none of whom are currently expected to participate in the sales of securities pursuant to the prospectus contained in this registration statement.
- (26) Shares beneficially owned before the offering includes 1,058,559 shares of common stock issuable upon exercise of warrants, including 313,235 shares underlying the Warrants that are being offered pursuant to this prospectus. Mitchell P. Kopin (“Mr. Kopin”) and Daniel B. Asher (“Asher”), each of whom are managers of Intracoastal Capital LLC (“Intracoastal”), have shares voting control and investment discretion over the securities reported herein that are held by Intracoastal. As a result, each of Mr. Kopin and Me. Sher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities and Exchange Act of 1934, as amended, of the securities reported herein that are held by Intracoastal.
- (27) Shares beneficially owned before the offering includes 547,345 shares of common stock issuable upon exercise of warrants, including 252,550 shares underlying the Warrants that are being offered pursuant to this prospectus.
- (28) Shares beneficially owned before the offering includes 268,233 shares of common stock issuable upon exercise of warrants, including 124,059 shares underlying the Warrants that are being offered pursuant to this prospectus.
- (29) Shares beneficially owned before the offering includes 21,143 shares of common stock issuable upon exercise of warrants, including 13,292 shares underlying the Warrants that are being offered pursuant to this prospectus.
- (30) Shares beneficially owned before the offering includes 8,514 shares of common stock issuable upon exercise of warrants, including 3,938 shares underlying the Warrants that are being offered pursuant to this prospectus.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Some of the statements in this prospectus and in any prospectus supplement we may file constitute “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. These statements relate to future events concerning our business and to our future revenues, operating results and financial condition. In some cases, you can identify forward-looking statements by terminology such as “may,” “will,” “could,” “would,” “should,” “expect,” “plan,” “anticipate,” “intend,” “believe,” “estimate,” “forecast,” “predict,” “propose,” “potential” or “continue,” or the negative of those terms or other comparable terminology.

Any forward looking statements contained in this prospectus or any prospectus supplement are only estimates or predictions of future events based on information currently available to our management and management’s current beliefs about the potential outcome of future events. Whether these future events will occur as management anticipates, whether we will achieve our business objectives, and whether our revenues, operating results or financial condition will improve in future periods are subject to numerous risks. There are a number of important factors that could cause actual results to differ materially from the results anticipated by these forward-looking statements. These important factors include those that we discuss under the heading “Risk Factors” and in other sections of our Annual Report on Form 10-K for the year ended December 31, 2019, as filed with the Securities and Exchange Commission (SEC), as well as in our other reports filed from time to time with the SEC that are incorporated by reference into this prospectus. You should read these factors and the other cautionary statements made in this prospectus and in the documents we incorporate by reference into this prospectus as being applicable to all related forward-looking statements wherever they appear in this prospectus or the documents we incorporate by reference into this prospectus. If one or more of these factors materialize, or if any underlying assumptions prove incorrect, our actual results, performance or achievements may vary materially from any future results, performance or achievements expressed or implied by these forward-looking statements. We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We are required to file annual, quarterly and special reports, proxy statements and other information with the SEC. Our filings with the SEC are also available to the public at the SEC’s Internet web site at <http://www.sec.gov>.

We have filed a registration statement, of which this prospectus is a part, covering the securities offered hereby. As allowed by SEC rules, this prospectus does not include all of the information contained in the registration statement and the included exhibits, financial statements and schedules. You are referred to the registration statement, the included exhibits, financial statements and schedules for further information. This prospectus is qualified in its entirety by such other information.

We are subject to the information and periodic reporting requirements of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and, in accordance therewith, file periodic reports, proxy statements and other information with the SEC. Such periodic reports, proxy statements and other information are available to the public over the Internet at the website of the SEC referred to above. We maintain a website at <http://www.arcadiabio.com>. The reference to our website address does not constitute incorporation by reference of the information contained on our website, and you should not consider the contents of our website in making an investment decision with respect to our common stock.

INCORPORATION OF INFORMATION BY REFERENCE

The SEC allows us to “incorporate by reference” the information we file with it, which means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is an important part of this prospectus, and certain information that we will later file with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below, as well as any future filings made with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act from the date of the initial registration statement and prior to the effectiveness of this registration statement, and any filings made after the date of this prospectus until we sell all of the securities under this prospectus, except that we do not incorporate any document or portion of a document that was furnished and deemed by the rules of the SEC not to have been filed:

- Our annual report on Form 10-K for the fiscal year ended December 31, 2019, filed with the SEC on March 25, 2020;
- Our quarterly reports on Form 10-Q for the quarters ended March 31, 2020, June 30, 2020, and September 30, 2020, filed with the SEC on May 13, 2020, August 13, 2020 and November 13, 2020, respectively;
- Our current reports on Form 8-K filed with the SEC on March 25, 2020, April 21, 2020, May 13, 2020, May 14, 2020, May 18, 2020, June 3, 2020, July 2, 2020, July 6, 2020, July 8, 2020, August 13, 2020, November 12, 2020, November 18, 2020, December 22, 2020 and January 29, 2021;

- Definitive Proxy Statement on Schedule 14A filed with the SEC on April 17, 2020 for our annual meeting of stockholders held on June 1, 2020; and
- The description of our common stock contained in our Form 8-A/A filed on May 14, 2015.

Additionally, all reports and other documents subsequently filed by us pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act after (i) the date of the initial registration statement and prior to effectiveness of the registration statement; and (ii) the date of this prospectus and prior to the termination or completion of this offering, shall be deemed to be incorporated by reference in this prospectus and to be part hereof from the date of filing of such reports and other documents. Any information that we subsequently file with the SEC that is incorporated by reference as described above will automatically update and supersede any previous information that is part of this prospectus. Nothing in this prospectus shall be deemed to incorporate information furnished but not filed with the SEC pursuant to Items 2.02, 7.02 or 9.01 of Form 8-K.

We hereby undertake to provide without charge to each person, including any beneficial owner, to whom a copy of this prospectus is delivered, upon written or oral request of any such person, a copy of any and all of the information that has been or may be incorporated by reference in this prospectus, other than exhibits to such documents. Requests for such copies should be directed to our Corporate Secretary at 202 Cousteau Place, Suite 105, Davis, CA 95618, Telephone (530) 750-7191.

DESCRIPTION OF OUR CAPITAL STOCK

The selling stockholders may, from time to time, sell, transfer, or otherwise dispose of any or all of their shares of common stock or interests in shares of common stock on any stock exchange, market, or trading facility on which the shares are traded or in private transactions at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices. This prospectus provides you with a general description of the common stock the selling stockholders may offer.

The description below of our capital stock and provisions of our articles of incorporation and bylaws are summaries and are qualified by reference to the articles of incorporation and the bylaws. These documents are filed as exhibits to the registration statement of which this prospectus is a part.

Our authorized capital stock consists of 150,000,000 shares of common stock, \$0.001 par value, and 20,000,000 shares of preferred stock, \$0.001 par value. As of January 28, 2021, there were no outstanding shares of preferred stock and 21,327,645 outstanding shares of common stock.

Common Stock

Holders of our common stock are entitled to one vote per share for each share held of record on all matters submitted to a vote of stockholders and do not have cumulative voting rights. Our certificate of incorporation does not provide for cumulative voting. Subject to preferences that may be applicable to any outstanding preferred stock, the holders of our common stock are entitled to receive ratably such dividends, if any, as may be declared by our board of directors out of legally available funds. Upon liquidation, dissolution or winding-up, the holders of our common stock are entitled to share ratably in all of our assets which are legally available for distribution, after payment of or provision for all liabilities and the liquidation preference of any outstanding preferred stock. The holders of our common stock have no preemptive, subscription, redemption or conversion rights.

Preferred Stock

The board of directors has the authority, without further action by the stockholders, to issue up to 20,000,000 shares of preferred stock, \$0.001 par value per share, in one or more series. The board of directors will also have the authority to designate the rights, preferences, privileges and restrictions of each such series, including dividend rights, dividend rates, conversion rights, voting rights, terms of redemption, redemption prices, liquidation preferences, and the number of shares constituting any series.

The issuance of preferred stock may have the effect of delaying, deferring or preventing a change in control of the company without further action by the stockholders. The issuance of preferred stock with voting and conversion rights may also adversely affect the voting power of the holders of common stock. In certain circumstances, an issuance of preferred stock could have the effect of decreasing the market price of the common stock.

Anti-Takeover Effects of Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws

Our amended and restated certificate of incorporation and our amended and restated bylaws contain certain provisions that could have the effect of delaying, deterring or preventing another party from acquiring control of us. These provisions and certain provisions of Delaware law, which are summarized below, are expected to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed, in part, to encourage persons seeking to acquire control of us to negotiate first with our board of directors. We believe that the benefits of increased protection of our potential ability to negotiate more favorable terms with an unfriendly or unsolicited acquirer outweigh the disadvantages of discouraging a proposal to acquire us.

Undesignated Preferred Stock

As discussed above, our board of directors will have the ability to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to change control of us. These and other provisions may have the effect of deterring hostile takeovers or delaying changes in control or management of our company.

Limits on Ability of Stockholders to Act by Written Consent or Call a Special Meeting

Our amended and restated certificate of incorporation provides that our stockholders may not act by written consent, which may lengthen the amount of time required to take stockholder actions. As a result, a holder controlling a majority of our capital stock would not be able to amend our bylaws or remove directors without holding a meeting of our stockholders called in accordance with our bylaws.

In addition, our amended and restated bylaws provide that special meetings of the stockholders may be called only by the majority of our board of directors. Stockholders may not call a special meeting, which may delay the ability of our stockholders to force consideration of a proposal or for holders controlling a majority of our capital stock to take any action, including the removal of directors.

Requirements for Advance Notification of Stockholder Nominations and Proposals

Our amended and restated bylaws require advance notice procedures with respect to stockholder proposals and the nomination of candidates for election as directors, other than nominations made by or at the direction of our board of directors or a committee of our board of directors. These provisions may have the effect of precluding the conduct of certain business at a meeting if the proper procedures are not followed. These provisions may also discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of our company.

Board Classification

Our board of directors is divided into three classes, one class of which is elected each year by our stockholders. The directors in each class will serve three-year terms. A third party may be discouraged from making a tender offer or otherwise attempting to obtain control of us as it is more difficult and time consuming for stockholders to replace a majority of the directors on a classified board.

No Cumulative Voting

Our amended and restated certificate of incorporation and amended and restated bylaws does not permit cumulative voting in the election of directors. Cumulative voting allows a stockholder to vote a portion or all of its shares for one or more candidates for seats on the board of directors. Without cumulative voting, a minority stockholder may not be able to gain as many seats on our board of directors as the stockholder would be able to gain if cumulative voting were permitted. The absence of cumulative voting makes it more difficult for a minority stockholder to gain a seat on our board of directors to influence our board's decision regarding a takeover.

Amendment of Charter and Bylaws Provisions

The amendment of the above provisions of our amended and restated certificate of incorporation requires approval by holders of at least two-thirds of our outstanding capital stock entitled to vote generally in the election of directors. The amendment of our bylaws requires approval by the holders of at least two-thirds of our outstanding capital stock entitled to vote generally in the election of directors.

Delaware Anti-Takeover Statute

We are subject to the provisions of Section 203 of the Delaware General Corporate Law, or DGCL, regulating corporate takeovers. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging, under certain circumstances, in a business combination with an interested stockholder for a period of three years following the date the person became an interested stockholder unless:

- prior to the date of the transaction, our board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, calculated as provided under Section 203; or
- at or subsequent to the date of the transaction, the business combination is approved by our board of directors and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

Generally, a business combination includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. An interested stockholder is a person who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, did own 15% or more of a corporation's outstanding voting stock. We expect the existence of this provision to have an anti-takeover effect with respect to transactions our board of directors does not approve in advance. We anticipate that Section 203 may also discourage attempts that might result in a premium over the market price for the shares of common stock held by stockholders.

The provisions of Delaware law and the provisions of our amended and restated certificate of incorporation and amended and restated bylaws, as amended upon the completion of this offering, could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they might also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions might also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders might otherwise deem to be in their best interests.

Forum Selection

Our amended and restated certificate of incorporation provides that unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware is the sole and exclusive forum for:

- any derivative action or proceeding brought on our behalf;
- any action asserting a breach of fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders;
- any action asserting a claim against us arising pursuant to any provisions of the DGCL, our amended and restated certificate of incorporation or our amended and restated bylaws; or
- any action asserting a claim against us that is governed by the internal affairs doctrine.

These exclusive-forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage lawsuits against us and our directors, officers and other employees. Furthermore, the enforceability of similar choice of forum provisions in other companies' charter documents has been challenged in legal proceedings, and it is possible that a court could find these types of provisions to be inapplicable or unenforceable. If a court were to find either exclusive-forum provision in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving the dispute in other jurisdictions, which could harm our business.

These exclusive-forum provisions are not intended to apply to any causes of action arising under the Securities Act or the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction.

Listing

Our common stock is listed on the NASDAQ Capital Market under the symbol "RKDA".

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company.

USE OF PROCEEDS

We are registering shares of our common stock pursuant to registration rights granted to the selling stockholders. We will not receive any of the proceeds from any sale or other disposition of the common stock covered by this prospectus. All proceeds from the sale of the common stock will be paid directly to the selling stockholders. We will receive proceeds upon the cash exercise of the Warrants for which the underlying shares of common stock are being registered hereunder. Assuming full cash exercise of the Warrants, we would receive proceeds of approximately \$13.9 million. We currently intend to use the cash proceeds from any Warrant exercise for working capital and general corporate purposes.

PLAN OF DISTRIBUTION

Each Selling Stockholder (the "Selling Stockholders") of the securities and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of their securities covered hereby on the Nasdaq Capital Market or any other stock exchange, market or trading facility on which the securities are traded or in private transactions. These sales may be at fixed or negotiated prices. A Selling Stockholder may use any one or more of the following methods when selling securities:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the securities as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- settlement of short sales;
- in transactions through broker-dealers that agree with the Selling Stockholders to sell a specified number of such securities at a stipulated price per security;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;

- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The Selling Stockholders may also sell securities under Rule 144 or any other exemption from registration under the Securities Act of 1933, as amended (the “Securities Act”), if available, rather than under this prospectus.

Broker-dealers engaged by the Selling Stockholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the Selling Stockholders (or, if any broker-dealer acts as agent for the purchaser of securities, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this Prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with FINRA Rule 2121; and in the case of a principal transaction a markup or markdown in compliance with FINRA IM-2121.

In connection with the sale of the securities or interests therein, the Selling Stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the securities in the course of hedging the positions they assume. The Selling Stockholders may also sell securities short and deliver these securities to close out their short positions, or loan or pledge the securities to broker-dealers that in turn may sell these securities. The Selling Stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities which require the delivery to such broker-dealer or other financial institution of securities offered by this prospectus, which securities such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The Selling Stockholders and any broker-dealers or agents that are involved in selling the securities may be deemed to be “underwriters” within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the securities purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Each Selling Stockholder has informed the Company that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the securities.

The Company is required to pay certain fees and expenses incurred by the Company incident to the registration of the securities. The Company has agreed to indemnify the Selling Stockholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

We agreed to keep this prospectus effective until the earlier of (i) the date on which the securities may be resold by the Selling Stockholders without registration and without regard to any volume or manner-of-sale limitations by reason of Rule 144, without the requirement for the Company to be in compliance with the current public information under Rule 144 under the Securities Act or any other rule of similar effect or (ii) all of the securities have been sold pursuant to this prospectus or Rule 144 under the Securities Act or any other rule of similar effect. The resale securities will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the resale securities covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Exchange Act, any person engaged in the distribution of the resale securities may not simultaneously engage in market making activities with respect to the common stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the Selling Stockholders will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of the common stock by the Selling Stockholders or any other person. We will make copies of this prospectus available to the Selling Stockholders and have informed them of the need to deliver a copy of this prospectus to each purchaser at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

LEGAL MATTERS

Weintraub Tobin Chediak Coleman Grodin Law Corporation will pass upon legal matters in connection with the validity of the common stock offered hereby.

EXPERTS

The financial statements incorporated in this Prospectus by reference from the Company's Annual Report on Form 10-K, have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report, which is incorporated herein by reference. Such financial statements have been so incorporated in reliance upon the report of such firm given upon their authority as experts in accounting and auditing.

INTERESTS OF NAMED EXPERTS AND COUNSEL

Except as noted below, no expert or counsel named in this prospectus as having prepared or certified any part of this prospectus or having given an opinion upon the validity of the securities being registered or upon other legal matters in connection with the registration or offering of the securities was employed on a contingency basis, or had, or is to receive, in connection with the offering, a substantial interest, direct or indirect, in the registrant or any of its parents or subsidiaries. Nor was any such person connected with the registrant or any of its parents or subsidiaries as a promoter, managing or principal underwriter, voting trustee, director, officer, or employee.