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

# FORM 10-K

**(Mark One)**

☑ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018;

or

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to

Commission file number 001-38161


**Calyxt, Inc.**
(Exact name of registrant as specified in its charter)

| | |
|---|---|
| Delaware<br>(State or other jurisdiction of<br>incorporation or organization) | 27-1967997<br>(I.R.S. Employer<br>Identification No.) |
| 2800 Mount Ridge Road<br>Roseville, MN<br>(Address of principal executive offices) | 55113-1127<br>(Zip Code) |

Registrant's telephone number, including area code: (651) 683-2807

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

| Title of each class | Name of each exchange on which registered |
|---|---|
| Common Stock ($0.0001 par value) | The NASDAQ Global Market |

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

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

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

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☑ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company", and "emerging growth company" in Rule 12b-2 of the Exchange Act (check one):

Large Accelerated Filer ☐ Accelerated Filer ☑ Non-accelerated Filer ☐ Smaller Reporting Company ☐

Emerging Growth Company ☑

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

Aggregate market value of the common stock held by non-affiliates of the registrant: As of June 30, 2018, the last business day of the registrant's most recently completed second fiscal quarter, the aggregate market value of shares of common stock held by non-affiliates of the registrant was $178,514,381.

The number of outstanding shares of the registrant's common stock on March 8, 2019 was 32,688,629 shares.

**DOCUMENTS INCORPORATED BY REFERENCE**

The information required by Part III of this Annual Report on Form 10-K, to the extent not set forth herein, is incorporated herein by reference from the registrant's definitive proxy statement relating to the registrant's Annual Meeting of Stockholders to be held in 2019, which definitive proxy statement shall be filed with the Securities and Exchange Commission not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

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**Terms**

When we use the terms "we," "us," the "Company," or "our" in this report, unless the context otherwise requires, we are referring to Calyxt, Inc. When we use the term "Cellectis," we are referring to Cellectis S.A., our majority stockholder.

The name and trademark, "Cellectis®" and "TALEN®", and other trademarks, trade names and service marks of Cellectis appearing in this Annual Report on Form 10-K are the property of Cellectis. We own the name and trademark, Calyxt™ and Calyno™; we also own or license other trademarks, trade names and service marks of Calyxt appearing in this Annual Report on Form 10-K. This Annual Report on Form 10-K also contains additional trade names, trademarks and service marks belonging to other companies. We do not intend our use or display of other parties' trademarks, trade names or service marks to imply, and such use or display should not be construed to imply, a relationship with, or endorsement or sponsorship of us by, these other parties.

**Cautionary Note Regarding Forward-Looking Statements**

This Annual Report on Form 10-K contains "forward-looking statements" within the meaning of the federal securities laws, including Section 27A of the Securities Act of 1933, as amended (the Securities Act), and Section 21E of the Securities Exchange Act of 1934, as amended (the Exchange Act).

We have made these forward-looking statements in reliance on the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. In some cases, you can identify these statements by forward-looking words such as "may," "might," "will," "should," "expects," "plans," "anticipates," "believes," "estimates," "predicts," "potential" or "continue," the negative of these terms and other comparable terminology. These forward-looking statements, which are subject to risks, uncertainties and assumptions about us, may include projections of our future financial performance, our anticipated growth strategies and anticipated trends in our business. These statements are only predictions based on our current expectations and projections about future events.

There are important factors that could cause our actual results, level of activity, performance or achievements to differ materially from the results, level of activity, performance or achievements expressed or implied by the forward-looking statements, including, without limitation, factors relating to:

- Our limited operating history;
- Our limited experience with the commercialization of product candidates;
- The challenges associated with achieving operating scale following the launch of our initial commercial product;
- Our incurrence of significant losses since our inception and likelihood that we will continue to incur significant losses for the foreseeable future;
- Our reliance on contractual counterparties;
- Significant competition from competitors with substantially greater resources than us;
- Public perceptions of biotechology; genetically engineered products; and ethical, legal, environmental, health and social concerns;
- Uncertain and evolving regulatory requirements within and outside of the United States;
- Government policies and regulations affecting the agricultural sector and related industries;
- Commodity prices and other market risks facing the agricultural sector;
- Our product development efforts use complex integrated technology platforms and require substantial time and resources;
- Our success in obtaining or maintaining necessary rights to product components and processes for our development pipeline through acquisitions and in-licenses;
- Our reliance on gene-editing technologies that may become obsolete in the future;

- Our need to raise additional funding and the availability of additional capital or capital on acceptable terms;
- Our reliance on third parties in connection with our field trials and research services;
- The recognition of value in our products by farmers and food processors, and the ability of farmers and food processors to work effectively with our crops;
- Our ability to secure third-party contractors necessary for the development and commercial launch of our products;
- Our ability to accurately forecast demand for our products;
- The needs of food manufacturers and the recognition of shifting consumer preferences;
- Adverse natural conditions and the highly seasonal and weather-sensitive nature of our business;
- Our exposure to product liability claims;
- The geographic concentration of our business activities;
- Our ability to use net operating losses to offset future taxable income;
- The adequacy of our patents and patent applications;
- Our licensing of intellectual property from Cellectis and reliance on Cellectis to prosecute, maintain, defend or enforce such intellectual property;
- Uncertainty relating to our patent positions that involve complex scientific, legal and factual analysis;
- The limited lifespan of our patents and limitations in intellectual property protection in some countries outside the United States;
- Developments in patent and other intellectual property law;
- Our ability to identify relevant third-party patents and to interpret the relevance, scope and expiration of third-party patents;
- Potential assertions of infringement, misappropriation or other violations of intellectual property rights, including licensing agreements;
- Loss or damage to our germplasm libraries and our ability to access and maintain competitive germplasm libraries;
- Our ability to attract and retain senior management and key employees;
- Our relationship with Cellectis, our majority stockholder, and its ability to control the direction of our business;
- Our being a “controlled company” and, as a result, qualifying for, and intending to rely on, exemptions from certain corporate governance requirements;
- Our status as an emerging growth company; and
- Those factors discussed in “Item 1A. Risk Factors” below.

While the list of factors presented here is considered representative, no such list should be considered to be a complete statement of all potential risks and uncertainties. Unlisted factors may present significant additional obstacles to the realization of forward-looking statements. Consequences of material differences in results as compared with those anticipated in the forward-looking statements could include, among other things, business disruption, operational problems, financial loss, and legal liability to third parties and similar risks, any of which could have a material adverse effect on our financial condition, results of operations, credit rating or liquidity. Therefore, you should not rely on any of these forward-looking statements.

Any forward-looking statement made by us in this Annual Report on Form 10-K is based only on information currently available to us and speaks only as of the date of this report. We do not assume any obligation to publicly provide revisions or updates to any forward-looking statements after the date of this Annual Report on Form 10-K, whether as a result of new information, future developments or otherwise, should circumstances change, except as otherwise required by securities and other applicable laws.

**Market Data**

Unless otherwise indicated, information contained in this Annual Report on Form 10-K concerning our industry and the markets in which we operate is based on information from various sources, including independent industry publications. In presenting this information, we have also made assumptions based on such data and other similar sources, and on our knowledge of, and our experience to date in, the potential markets for our product. The industry in which we operate is subject to a high degree of uncertainty and risk due to a variety of

factors, including those described in the section entitled "Risk Factors" in Section 1A below. These and other factors could cause results to differ materially from those expressed in the estimates made by the independent parties and by us.

**Website Disclosure**

We use our website (www.calyxt.com), our corporate Twitter account (@Calyxt_Inc) and our corporate LinkedIn account (https://www.linkedin.com/company/calyxt-inc) as routine channels of distribution of company information, including press releases, analyst presentations, and supplemental financial information, as a means of disclosing material non-public information and for complying with our disclosure obligations under Regulation FD. Accordingly, investors should monitor our website and our corporate Twitter and LinkedIn accounts in addition to following press releases, filings with the Securities and Exchange Commission, or the SEC, and public conference calls and webcasts. Additionally, we provide notifications of announcements as part of our website. Investors and others can receive notifications of new press releases posted on our website by signing up for email alerts.

None of the information provided on our website, in our press releases or public conference calls and webcasts or through social media is incorporated into, or deemed to be a part of, this Annual Report on Form 10-K or in any other report or document we file with the SEC, and any references to our website or our corporate Twitter account are intended to be inactive textual references only.

**JOBS Act**

We qualify as an "emerging growth company" as defined in the Jumpstart Our Business Startups (JOBS) Act of 2012 (the JOBS Act). As an emerging growth company, we may take advantage of certain reduced disclosure and other requirements that are otherwise applicable generally to public companies. Pursuant to these provisions:

- we are not required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002 (the Sarbanes-Oxley Act);
- we have (i) reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and (ii) exemptions from the requirements of holding a non-binding advisory vote on executive compensation, including golden parachute compensation.

We may take advantage of these provisions for up to five years or until such earlier time that we are no longer an emerging growth company.

We would cease to be an emerging growth company upon the earliest to occur of (1) the last day of the fiscal year in which we have more than $1.07 billion in annual revenue; (2) the date we qualify as a "large accelerated filer," with at least $700 million of public float (3) the issuance, in any three-year period, by us of more than $1.0 billion in non-convertible debt securities held by non-affiliates; and (4) the last day of the fiscal year ending after the fifth anniversary of our initial public offering.

In addition, Section 107 of the JOBS Act also provides that an emerging growth company can use the extended transition period provided in Section 7(a)(2)(B) of the Securities Act for complying with new or revised accounting standards. This permits an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We intend to take advantage of the exemptions discussed above. Accordingly, the information contained herein may be different than the information you receive from other public companies.

**PART I**

**ITEM 1. BUSINESS.**

**Company Overview**

Calyxt was incorporated in the State of Delaware in 2010 and is a majority-owned subsidiary of Cellectis, a leading gene-editing company focused on the development of immuno-oncology therapeutics.

We are a healthy food ingredient company. We leverage proprietary intellectual property, our technical expertise, and an end-to-end supply chain toward our mission of "Making the Food You Love a Healthier Choice™".

Using our proprietary technologies and expertise, including TALEN gene-editing technology exclusively licensed to us in the field of agriculture, we develop food crops with targeted traits quickly and more cost effectively than traditional methods. Our technologies enable precise cuts to DNA in a single plant cell using the plant's natural repair machinery. This allows us to make our desired genome edit and regenerate the single cell into a full plant that includes this gene edit. We believe that we can identify a consumer need and develop a product from "concept to fork" in cycles as short as six years by utilizing these proprietary technologies.

We believe that we are well-positioned to address consumer preferences that are evolving to demand healthier, more nutritionally rich foods. To bring our consumer-centric products to the marketplace, we intend to repurpose and leverage existing supply chain capacity by contracting, tolling or partnering with players in the existing supply chain, such as seed production companies, seed distributors, farmers, crushers, millers, and refiners. We expect this will allow us to apply our resources to maximizing innovation and product development while minimizing our capital expenditures and overhead. We intend to strategically out-license our intellectual property to maximize our market opportunity.

Our first product is a High Oleic Soybean designed to produce a healthier oil that has increased heat stability with zero trans fats per serving. We completed our first sales of our High Oleic Soybean Oil and High Oleic Soybean Meal in the first quarter of 2019. Among our other product candidates are other soybean varieties and a high fiber wheat.

Our current commercial focus is North America. This may expand over time to other geographies, subject to customer demand and regulatory requirements, among other factors. We also intend to explore the ability to add value through our existing product candidates once they are commercialized by combining traits in the same crop, which may allow us to deliver products with additional benefits without adding significant cost.

**Market and Industry Overview**

Consumers have developed an increasingly heightened awareness of the role that dietary habits play in long-term wellness. This trend is especially prevalent in wealthier, developed nations where consumers have greater access to information that is helping to shift their consumption habits. In the United States and other developed nations buying habits have been creating dynamic shifts in the grocery aisle. Consumers view food as a key to good health. More food products are being launched that go beyond basic nutrition to support health, digestive health, and higher energy levels. Locally sourced foods with a direct-to-consumer model are becoming more attractive and the demand for transparency in food sourcing, production and labeling is gaining traction. We believe that as consumers continue the shift from a traditional production-driven food culture to a modern demand-driven food culture, they will continue to demand more information and accountability about how ingredients are sourced and processed, how "real" their food products are, and how responsive they are to consumers' desire for choice and customization.

Regulatory agencies are also playing a larger role in monitoring which food ingredients reach consumers. Beginning in 2018, the FDA banned certain uses of partially hydrogenated oils, the primary artificial source of

trans fat in processed foods. Following the passage of the Healthy, Hunger-Free Kids Act of 2010, the USDA gained significant oversight of the federal school lunch program and holds the authority to set new, healthier standards for food sold in U.S. schools. These healthier food mandates include minimum serving requirements for fiber, fruits and vegetables and maximum allowable content standards for fat, sugar and sodium. Consumers' rising demand for healthier food presents an opportunity for us to provide our innovative solutions for customers and the food industry.

**Supply Chain**

We intend to repurpose and leverage supply chain capacity by contracting, tolling or partnering with players in the existing supply chain, which will allow us to apply our resources toward maximizing innovation and product development while minimizing our capital expenditures and overhead. As we continue to streamline our supply chain, we expect to enter into additional contracts and strategic partnerships with participants and members of the value chain, in an effort to maintain control of the process and help ensure product quality, manage cyclical demand and capture value.

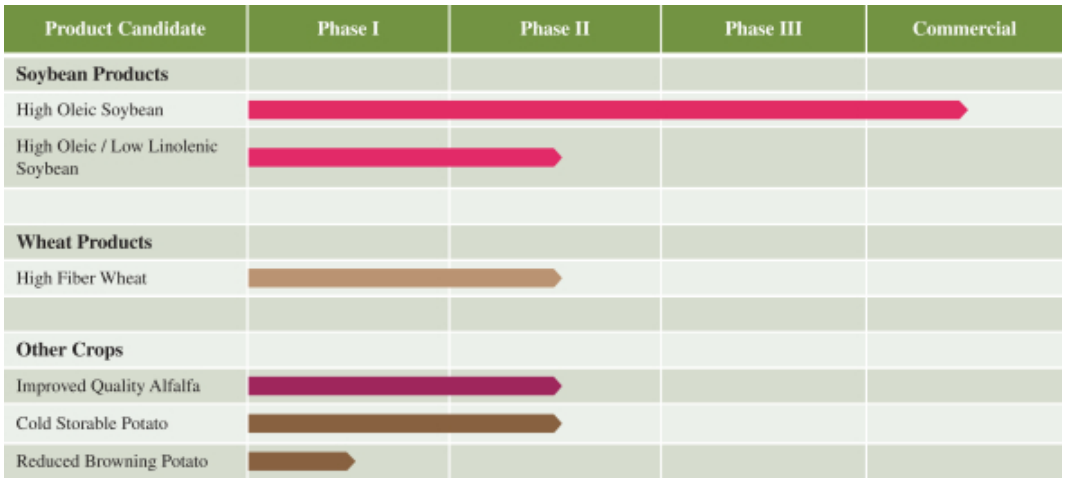
We believe our product candidates will benefit from being grown, processed and stored utilizing existing third-party infrastructure and standard industry practices that are currently used for non-transgenic products. Our intent is to outsource to third parties, such as seed production companies, farmers, grain storage facilities, soybean crushers and refiners, and wheat millers, for the production and processing of our products in accordance with our stewardship requirements. We do not anticipate using our cash resources to build or purchase processing assets.

**Our Product Pipeline**

Our product pipeline is prioritized to include a variety of traits for soybeans, wheat, alfalfa, canola and potatoes. We continue to refine our portfolio and seek to take advantage of the largest market opportunities. We intend to conduct further development programs to build upon our current pipeline. In the future, we may expand our product pipeline to include other crops, whether through collaboration or our own direct commercialization.

We categorize our stages of pre-commercial development from Discovery, where we identify genes of interest, to Phase I, where we conduct our gene editing and produce an initial seed with the desired edit, to Phase II, where we perform validation testing, to Phase III, where we develop the first commercial-scale pilot production and begin to build out the supply chain and inventory and perform customer testing prior to commercialization.

As of December 31, 2018, we had a total of six product candidates in Phase I or higher that have also been deemed non-regulated under the Biotechnology Regulatory Services' "Am I Regulated?" process of APHIS. A summary of these development programs is presented in the table below. In the first quarter of 2019, we successfully completed consultation with FDA for our High Oleic Soybean and we also have multiple projects in the Discovery phase and continue to explore collaboration opportunities for our technologies.




***High Oleic Soybean***

Soybean oil has historically been partially hydrogenated to enhance its oxidative stability in order to increase shelf life and improve frying characteristics. This process, however, creates trans-unsaturated fatty acids, or trans fats, which have been demonstrated to raise low-density lipoprotein (LDL) cholesterol levels and lower high-density lipoprotein (HDL) cholesterol levels. High LDL and low HDL have been tied to increased risk for cardiovascular disease. The discovery that dietary trans fats increase the risk of several adverse health issues led the FDA to rule in 2003 that manufacturers must include trans-fat content information on the "Nutrition Facts" label of foods. In 2015, the FDA banned the addition of partially hydrogenated oils to food products in a phased approach, with the first phase effective June 2018.

Monounsaturated fats, such as oleic acid, have been linked to reducing LDL cholesterol and triglycerides and raising HDL cholesterols. Diets rich in monounsaturated acids are associated with lower fat mass and decreased blood pressure. High levels of oleic acids can be found in olive, canola, sunflower and safflower oils.

We developed a soybean trait that has produced oils with a fatty acid profile that contains 80% oleic acid, 20% less saturated fatty acids compared to commodity soybean oil and zero grams of trans fats per serving.

Oil produced from our High Oleic Soybean also has multiple desirable characteristics as an ingredient for the food industry. The high level of oleic acid in our soybean oil enhances oxidative stability compared to commodity oil. This eliminates the need for partial hydrogenation, and thus little to no trans fats are produced during oil production. Furthermore, our High Oleic Soybean Oil offers additional potential benefits, including reduced saturated fats, a threefold increase in fry-life, and reduced polymerization upon frying at high temperatures. Soybean oil is also neutral in flavor, odorless and colorless, and is therefore desired as a food ingredient because it has limited impact on the sensory characteristics of the final food product.

Plant breeders have developed soybean varieties that are adapted to distinct latitudes and agroclimatic conditions—which are referred to as maturity groups. We initially introduced our High Oleic Soybean in the northern United States on one variety within a particular maturity group range. Our High Oleic Soybean seed is sold directly to or through distributors to farmers. In 2018 we contracted more than 17,000 acres with nearly 80 growers in South Dakota and Minnesota to grow this High Oleic Soybean. The harvest of these High Oleic Soybean acres has been completed and we have taken delivery of a portion of the harvested crop. We have contracted with third parties to crush and refine our High Oleic Soybean on a commercial scale, enabling sales of High Oleic Soybean Oil and High Oleic Soybean Meal to customers. We commercialized our High Oleic Soybean product candidate in the first quarter of 2019.

We intend to launch new High Oleic Soybean varieties in 2020 and 2021. This will enable us to expand to other growing locations, and over time we expect to continue to add to this product portfolio by expanding into early, middle and late maturity groups. We believe this strategy will enable us to expand our supply chain through additional crushing plants within target growing regions and at the same time lower potential premiums and production costs as we introduce into the supply chain additional varieties that meet farmer needs.

***High Fiber Wheat***

Fiber is the indigestible portion of food that is essential for healthy digestion. Research has shown that fiber may play a large role in maintaining bowel health, lowering cholesterol, stabilizing blood glucose levels and controlling weight gain. A high fiber diet has the potential to lower the rate of glucose entry into circulation, thus decreasing the risk of food-related chronic diseases, such as coronary artery disease and diabetes. The average American adult consumes approximately 15-18 grams of fiber daily, only half of the amount recommended by the U.S. Department of Health's dietary guidelines based on the average caloric intake. In recent years, the awareness of the health benefits of high fiber diets has increased. This has translated to a strong growth in demand for high fiber food products, with approximately 35% of grocery shoppers now seeking high fiber foods.

We are developing our High Fiber Wheat product candidate that could be used to produce white flour with up to three times more dietary fiber than standard white flour while maintaining the same flavor and convenience of use. By altering the proportion of certain slower digested carbohydrates in the wheat grain, we have developed a product candidate that we believe will exhibit increased dietary fiber. This would allow consumers to reach their daily value of fiber without changing their existing food preferences.

We believe our High Fiber Wheat flour will able to be incorporated into many food products—from pasta to bread. Whereas a single serving of whole wheat flour can provide 49% of an individual's daily fiber needs, a single serving of our High Fiber Wheat flour may provide up to 100% of the recommended daily requirement thereby allowing food manufacturers to make high fiber products sought after by many consumers.

This product candidate is currently in Phase II of our development process and is expected to launch as early as 2022. In March 2018 we received confirmation from USDA that our High Fiber Wheat is deemed non-regulated pursuant to APHIS's regulatory procedures. In October 2018 we successfully harvested High Fiber Wheat in field trials. In the next year, we intend to further confirm the product concept in field conditions and to complete food application studies.

In addition to our High Fiber Wheat product candidate, we are also developing other consumer traits in our wheat pipeline.

**Our Technology**

Our gene-editing platform relies on our capacity to custom design DNA-sequence specific cutting enzymes, or nucleases, for any chosen gene we intend to edit and our capability to introduce such custom-made nucleases into

the living plant cells we want to edit. Our platform also relies on precisely chosen protein families that can specifically recognize unique DNA sequences and can be tailored to target such sequences in any chosen gene or genetic region.

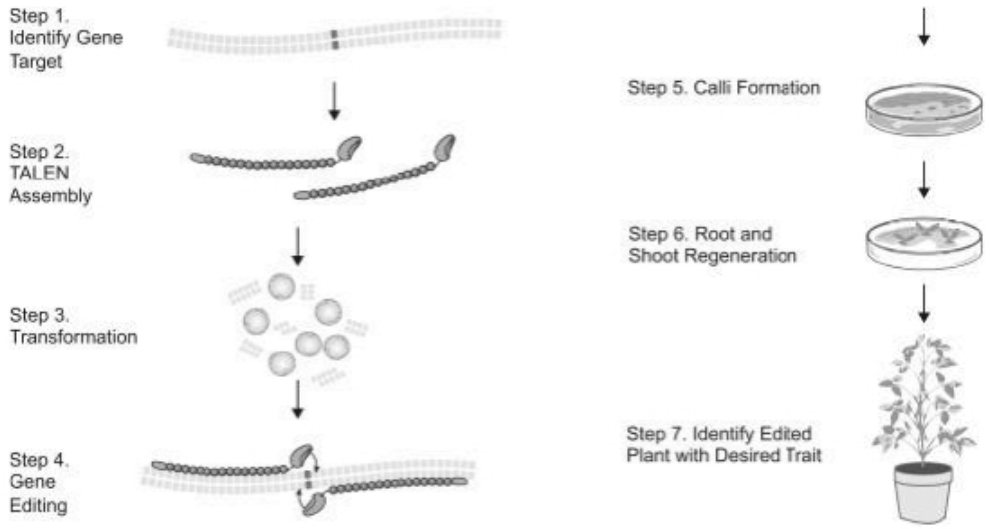
Our proprietary technologies and intellectual property portfolio enable us to edit the plant genome by knocking out genes or making precise gene edits. We take advantage of our knowledge about plant gene function to produce novel genetic variation that results in traits of value. A key difference between our gene-edited products and products created through genetic modification (GMO) is that GMOs insert foreign DNA into crops and our gene-editing does not. For each of our product candidates that we submitted to the U.S. Department of Agriculture (USDA), USDA confirmed that the product candidates are not regulated articles. This determination decreases our costs and increases our speed to market.

***Key Advantages of TALEN Technology***

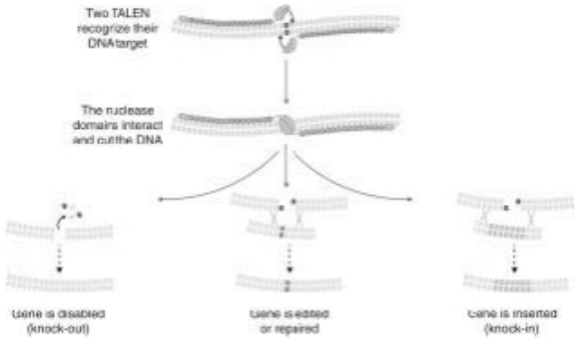
Our development process deploys our proprietary TALEN technology, which we currently use because of the following benefits:

- Intellectual property—We have a strong intellectual property position with respect to TALEN technology and its use to make our product candidates.
- Specificity—TALEN may be designed to limit its DNA cleavage to the desired sequence and to avoid cutting elsewhere in the genome. This parameter is essential as plant genomes are highly complex; for example, the wheat genome comprises approximately 16 billion base pairs.
- Precision—It is possible to design a TALEN that will cleave at any selected region in any gene. For example, there are four related FAD genes in the soybean genome. For our High Oleic Soybean, our TALEN edited the two genes that produce fatty acids in the seed.
- Efficiency—A large percentage of cells treated by TALEN bear the desired gene edit. Because of TALEN efficiency, only a handful of plants have to be regenerated to recover those with edits in the target gene.
- Validation—We have successfully edited more than 20 unique genes in 6 plant species since our inception in 2010 and can generate thousands of TALEN per week.
- Speed to Market—We can assess the viability of a trait in less than two years and commercialize it in as short as six years with a significantly reduced development cost compared to GMO development processes. Genetically modified products typically require an average of approximately 13 years and costs more than $130 million to develop.

The following chart depicts our development process:




The following figure depicts the process, identified in Step 4 in the figure above, of making gene edits using TALEN:




TALEN enable gene-editing by first recognizing a specific DNA sequence and then precisely inducing a controlled DNA double-strand break, which is the key to unlocking gene editing. This break serves as the baseline for a wide range of outcomes, from single nucleotide deletions, to large DNA insertions. The removal of nucleotides (through non-homologous end-joining) can result in gene inactivation or a gene knock-out. If a user-supplied DNA fragment with a similar sequence to the TALEN binding site is provided at the time of the DNA break, then novel information in that DNA fragment is copied into the plant genome (through homologous recombination). We are currently focused on using gene knock-outs and gene repair to develop new traits, which result in a non-transgenic product candidate.

**Intellectual Property**

Intellectual property protection is key to our business. We seek to protect our proprietary position by, licensing and filing United States and foreign patent applications on our key intellectual property. We also rely on trade secrets to develop and maintain our proprietary position and protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection. We rely on a combination of patent, copyright,

trademark, proprietary know-how, continuing technological innovations, trade secret laws, as well as confidentiality agreements, material transfer agreements, research agreements, and licensing agreements, to establish and protect our proprietary rights.

As of December 31, 2018, our patent portfolio is composed entirely of patents and patent applications that we have in-licensed from other parties. The majority of these patents and patent applications are licensed through Cellectis. We also have access to additional patents and patent applications through in-licensing agreements with research institutions and universities.

We are actively involved in the prosecution and protection of our key technology, which globally includes approximately 40 patent families comprised of over 150 patents and over 140 patent applications. Of those patents, 17 have been issued in the U.S., with the remaining issued in key geographies outside the U.S., primarily Europe, Japan, and China. This number also includes European patents validated in individual European countries. Of our patent applications, 39 are pending in the U.S., with the remanding pending in key geographies outside the U.S. Our core portfolio is directed to: (1) genetic editing of plants using TALEN technology, (2) genetic editing of plants using meganuclease technology, (3) genetic editing of plants using CRISPR technology, and (4) specific plant traits.

Individual patent terms extend for varying periods of time, depending upon the date of filing of the patent application, the date of patent issuance, and the legal term of patents in the countries in which they are obtained. The issued patents that we have in-licensed will expire on dates ranging from 2020 to 2033. If patents are issued on the pending patent applications that we have in-licensed, the resulting patents are projected to expire on dates ranging from 2023 to 2038.

The actual protection afforded by a patent varies on a product-by-product basis, from country-to-country, and depends upon many factors, including the type of patent, the scope of its coverage, the availability of legal remedies in a particular country, and the validity and enforceability of the patent. Notwithstanding our efforts, we cannot be sure that patents will be granted with respect to any patent applications we have in-licensed or filed or may in-license or file in the future, and we cannot be sure that any patents we have in-licensed or patents that may be in-licensed or granted to us in the future will not be challenged, invalidated, or circumvented or that such patents will be commercially useful in protecting our product candidates and technology. Moreover, trade secrets can be difficult to protect. While we have confidence in the measures we take to protect and preserve our trade secrets, such measures can be breached, and we may not have adequate remedies for any such breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. For more information regarding the risks related to our intellectual property, please see "Risk Factors—Risks Related to Intellectual Property."

***License Agreement with Cellectis***

Through our license agreement with Cellectis, we have access to intellectual property that broadly covers the use of engineered nucleases for plant gene editing. This intellectual property covers methods to edit plant genes using "chimeric restriction endonucleases," which include TALEN, CRISPR/Cas9, zinc finger nucleases, and some types of meganucleases. We believe this umbrella intellectual property applies broadly across gene editing in plants and makes us a key player in the gene editing intellectual property space.

Under our license agreement with Cellectis, we have exclusive sublicense rights (subject to existing non-exclusive sublicenses to third parties) to intellectual property exclusively licensed to Cellectis from the University of Minnesota in the field of researching, developing and commercializing agricultural and food products, including traits, seeds, and feed and food ingredients (excluding any application in connection with animals or animal cells). These patent applications cover the use of DNA replicons for gene editing.

We have also been granted a non-exclusive license to use the TALEN® trademark in connection with our use of licensed products under the agreement. Any improvements we make to the in-licensed intellectual property is

owned by us and licensed back to Cellectis on an exclusive basis for any use outside of our exclusive agricultural field of use. The exclusivity of our license agreement with Cellectis is subject to certain non-exclusive licenses Cellectis granted to third parties in the field of research.

In consideration for the license from Cellectis, we are required to pay to Cellectis, on a product-by-product and country-by-country basis, a royalty of 3% of net sales less certain items as defined including costs for grain and seed of any products that are covered by the patents licensed from Cellectis. In addition, we are required to pay Cellectis 30% of revenue we receive for sublicensing our rights under the agreement to third parties. Our payment obligations to Cellectis will expire upon the expiration of the last-to-expire valid claim of the patents licensed to us by Cellectis.

Under our license agreement with Cellectis, and as between the parties, Cellectis has the first right to control the prosecution, maintenance, defense and enforcement of the licensed intellectual property and we will have the right to step in and assume such control with respect to the patents owned by Cellectis and exclusively licensed to us under the agreement if Cellectis elects to not prosecute, maintain, defend or enforce such patents. In certain circumstances, if Cellectis elects to abandon any patents owned by Cellectis and exclusively licensed to us under the agreement, we have the right to assume ownership of such patents. In addition, some of the intellectual property that is licensed to us by Cellectis consists of a sublicense of intellectual property originally licensed to Cellectis by the University of Minnesota. Our license from Cellectis is subject to the license agreement between the University of Minnesota and Cellectis, and should our activities under such sublicense violate the license agreement between Cellectis and the University of Minnesota, we are responsible for any related damages that Cellectis may incur. In addition, we are required to reimburse Cellectis for any payments made by Cellectis to the University of Minnesota pursuant to the license agreement between the University of Minnesota and Cellectis to the extent that such payments are required to be made as a result of our applicable activities. Under the license agreement between Cellectis and the University of Minnesota, the University of Minnesota has the first right to control the prosecution and maintenance of the licensed intellectual property.

Our license agreement with Cellectis is perpetual. However, it may be terminated at any time upon the mutual written agreement of both parties, either party's uncured material breach of the agreement, or upon certain bankruptcy and insolvency related events.

***License Agreement between Cellectis and Regents of the University of Minnesota—TALEN***

In January 2011, Cellectis entered into an exclusive license agreement with the University of Minnesota, which was amended in 2012, 2014 and 2015. Pursuant to the agreement, as amended, Cellectis and its affiliates were granted an exclusive, worldwide, royalty-bearing, sublicensable license, under certain patents and patent applications owned by the University of Minnesota, to make, use, sell, import and otherwise dispose of products covered by the licensed patents, in all fields of use. These licensed patents relate to TALEN molecules and their use in gene editing.

Pursuant to the agreement, with respect to the agricultural field, Cellectis is required to pay to the University of Minnesota a yearly fee, as well as a commercialization fee for every seed variety containing new traits developed using the licensed technology. Cellectis is also required to pay the University of Minnesota milestone payments based on the net sales of licensed products in the agricultural field. Cellectis must also pay the University of Minnesota certain patent-related expenses for prosecuting and maintaining the licensed patents; we then reimburse Cellectis for these prosecution costs.

The agreement will expire upon the expiration of the last to expire valid claim of the licensed patents. The University of Minnesota may terminate the agreement upon advance written notice in the event of the insolvency or bankruptcy of Cellectis, and immediately upon written notice in the event that Cellectis challenges the validity or enforceability of any licensed patent in a court or other applicable authority. Cellectis and the University of Minnesota may terminate the agreement by written notice in the event of the other party's breach that has not been cured within a specified number of days after receiving notice of such breach.

***License Agreement between Calyxt and Regents of the University of Minnesota—CRISPR***

In December 2014, we entered into an exclusive license with the University of Minnesota, pursuant to which we were granted an exclusive, worldwide, sublicensable license under a specified patent application and any patents that issue therefrom owned by the University of Minnesota relating to the use of the CRISPR-Cas9 technology to make use, and commercialize products covered by the licensed patents in any field of use. Pursuant to the terms of the agreement, we must use commercially reasonable efforts to commercialize the licensed technology and to manufacture, offer to sell, and sell licensed products as soon as practicable and to maximize sales. We must also achieve certain sales- and patent-related milestones.

Per the terms of the agreement, we paid the University of Minnesota an upfront license fee. We are also required to pay an annual fee, patent-related expenses for prosecution and maintenance of the licensed patents, and a percentage of any revenues received by us under sublicenses. If we undergo a change of control and wish to assign all of our rights and duties under the agreement, we must pay the University of Minnesota a specified transfer fee.

Unless earlier terminated under the terms of the agreement, the agreement will continue in effect until no licensed patent is active and until no licensed patent application is pending. The University of Minnesota may terminate the agreement for our uncured breach of the agreement upon 90 days' prior written notice, or 60 days' prior written notice if the breach relates to our payment obligations under the agreement. The University of Minnesota may also terminate the agreement, upon 10 days' prior written notice, if we file for bankruptcy or become insolvent. The University of Minnesota may also immediately terminate the agreement if we or our agents or representatives commences or maintains an action in any court or before any governmental agency asserting or alleging the invalidity or unenforceability of the licensed patent rights. We may terminate the agreement for The University of Minnesota's uncured breach of the agreement upon 90 days' prior written notice. We may also terminate the agreement at any time upon 60 days' prior written notice.

***Cross-License Agreement with Two Blades Foundation***

In December 2014, we executed a cross-licensing agreement with Two Blades Foundation relating to transcription factors with modular DNA-binding domains (TAL) nuclease technologies, which was amended in 2016. Pursuant to the agreement, we granted Two Blades Foundation a non-exclusive license to TALEN technology for not-for-profit uses within the field of plants genetically engineered by TAL nuclease, including use in Two Blades Foundation's humanitarian efforts to support subsistence farming, and for certain commercial applications related to Two Blades Foundation's plant disease resistance programs. The intellectual property licensed to Two Blades Foundation was originally licensed to Cellectis by the University of Minnesota. Under the cross-license, we received a non-exclusive license under Two Blades Foundation's TAL Code technology related to nucleases for commercial uses of TAL nucleases in certain specified crop plants.

The agreement will expire upon the expiration of the last to expire valid claim of the licensed patents under the agreement. Either party may terminate the agreement in the event of the insolvency or bankruptcy of the other party, or immediately upon written notice in the event that the other party, or its sublicensees or subcontractors challenges the validity or enforceability of any licensed patent in a court or other applicable authority. Either party may terminate the agreement by written notice in the event of the other party's breach that has not been cured within a specified number of days after receiving notice of such breach. In the event of termination of license agreement between the University of Minnesota and Cellectis with respect to the TALEN technology, our license from Two Blades Foundation will also terminate.

***Trademarks***

As of December 31, 2018, we had two pending trademark applications in the United States. In the first quarter of 2019, we filed two additional trademark applications.

**Government Regulation and Product Compliance**

The United States and the European Union are the two leading jurisdictions, with distinct regulatory regimes applying different rules and requirements.

***United States***

In the United States, the Environmental Protection Agency (EPA), USDA and Food and Drug Administration (FDA) are primarily responsible for overseeing agriculture and food regulation and safety, although as many as 15 federal agencies also play a role in U.S. agriculture and food regulation, including several agencies within USDA. Biotechnology is regulated in the United States under the "Coordinated Framework for Biotechnology".

Our product candidates are not subject to regulatory review by the EPA. Other biotechnology products are subject to EPA regulatory review. As the EPA, USDA, and FDA consider the Coordinated Framework for Biotechnology, it is possible we could become subject to EPA regulatory review in the future. If that were to occur, it could impact our business.

The USDA has regulatory jurisdiction over transgenic crops through the Animal and Plant Health Inspection Service (APHIS). Under the Plant Protection Act, USDA requires anyone who wishes to import, transport interstate, or plant a regulated article to apply for a permit or notify APHIS that the introduction will be made. Regulated articles are defined in the Code of Federal Regulations (CFR) 7 CFR Part 340.1 as "any organism which has been altered or produced through genetic engineering which USDA determines is a plant pest or has reason to believe is a plant pest." The petition process to enable product commercialization can be a multi-year process that varies based on a number of factors, including APHIS' familiarity with similar products, the type and scope of the environmental review conducted, and the number and types of public comments received. APHIS conducts a comprehensive science-based review of the petition to assess, among other things, plant pest risk, environmental considerations pursuant to the National Environmental Policy Act of 1969, or NEPA, and any potential impact on endangered species. If, upon the completion of the review, APHIS grants the petition, the product is no longer deemed a "regulated article" and the petitioner may commercialize the product, subject to any conditions set forth in the decision. If APHIS does not determine the product to be non-regulated, the product may be subject to extensive regulation, including permitting requirements for import, handling, interstate movement, release into the environment, and inspections.

We submitted petitions to APHIS for six of our current product candidates including our High Oleic Soybean and High Fiber Wheat. We received confirmation from APHIS for all six product candidates that APHIS does not consider any of our product candidates to be regulated articles under the Plant Protection Act. There can be no guarantee of the timing or success in obtaining nonregulated status from APHIS for our other crops or that the governing regulations will not change. USDA is considering revisions to its rules governing biotechnology, which could negatively impact our business, including increasing our regulatory burden or providing uncertainty for the launch of our product candidates.

The FDA has jurisdiction to regulate more than 80 percent of the U.S. food supply. It derives its regulatory power from the Food, Drug, and Cosmetic Act, or FDCA, which has been amended over time by several subsequent laws. The FDA's oversight of food safety and security is primarily carried out by its Center for Food Safety and Applied Nutrition. To execute its responsibilities, the FDA employs a team of more than 900 investigators and 450 analysts in the foods program who conduct inspections and collect and analyze product samples. The FDA typically does not perform pre-market inspection for foods. The FDA also regulates ingredients, packaging, and labeling of foods, including nutrition and health claims and the nutrition facts panel. Foods are typically not subject to premarket review and approval requirements, with limited exceptions.

The FDA regulates foods made with GMOs under its 1992 Statement of Policy: Foods Derived from New Plant Varieties. Under this policy, the FDA regulates foods derived from genetically modified plant varieties consistent

with the framework for non-genetically modified foods. Under Section 409 of the FDCA, any substance that is reasonably expected to become a component of food is considered a food additive that is subject to premarket approval by the FDA, unless the substance is generally recognized as safe (GRAS). Companies are responsible for making an initial determination of whether a food substance falls under an existing food additive regulation, requires a new food additive petition, or is GRAS. A company may market a new food ingredient based on its independent determination that the substance is GRAS; however, the FDA can disagree and take enforcement action. The FDA offers a voluntary consultation process to determine whether foods derived from genetically modified plant varieties will be subject to these more stringent regulatory requirements. Developers routinely consult with the FDA prior to marketing and, in most cases, foods derived from genetically modified plant varieties are not subjected to premarket review and approval processes.

Calyxt has completed voluntary consultation with the FDA for our High Oleic Soybean. After review, the FDA had no further questions concerning human food ingredients or animal food derived Calyxt's High Oleic Soybean.

The FDA is currently evaluating its approach to the regulation of gene-edited plants. The FDA's thinking on the use of genome editing techniques to produce new plant varieties that are used for human or animal food continues to evolve. To that end, in January 2017 the FDA announced a Request for Comments (RFC) seeking public input to help inform its thinking about human and animal foods derived from new plant varieties produced using genome editing techniques. Among other things, the RFC asks for data and information in response to questions about the safety of foods from gene-edited plants, such as whether categories of gene-edited plants present food safety risks different from other plants produced through traditional plant breeding. If the FDA enacts new regulations or policies with respect to gene-edited plants, such policies could result in additional compliance costs and/or delay the commercialization of our product candidates.

***European Union***

In the European Union (the EU), genetically modified organisms (GMOs) and genetically modified food and feed products can only be sold in the market once they have been properly authorized. The procedures for evaluation and authorization of GMOs and genetically modified food and feed products are established by Regulation (EC) 1829/2003 on genetically modified food and feed and Directive 2001/18/EC on the release of GMOs into the environment. An application for authorization must be submitted under Directive 2001/18/EC if a company seeks to release GMOs for experimental purposes (e.g., field tests) and/or to sell GMOs, as such or in products, in the market (e.g., cultivation, importation or processing). In turn, an application for authorization must be submitted under Regulation (EC) 1829/2003 if a company seeks to sell GMOs in the market for food and feed use and/or food and feed products containing or produced from GMOs. At the national level, EU member states have the ability to restrict or prohibit GMO cultivation in their territories by invoking grounds such as environmental or agricultural policy objectives, town and country-planning, land use, coexistence, socio-economic impacts or public policy.

In addition, Directive 2001/18/EC, Regulation (EC) 1829/2003 and Regulation (EC) 1830/2003 establish specific labeling and traceability requirements for GMOs and products that contain or are produced from GMOs. Finally, Directives 2002/53/EC and 2002/55/EC require genetically modified varieties to be authorized before they can be included in a Common Catalogue of Varieties, which would permit the seeds of such genetically modified varieties to be marketed in the EU.

A recent ruling of the European Court of Justice (ECJ) in July 2018 clarified that only mutagenesis techniques which (a) have been used in a number of applications and (b) have a long safety record, can be exempted from these requirements. EU member states remain free to subject even such exempted organisms to the obligations under Directive 2001/18/EC, or to other obligations. The impact of this ruling on, and the ultimate treatment by the EU of, products produced using other advanced plant breeding techniques is not yet known and the final determination could have a negative impact on our business.

**Competition**

The market for agricultural biotechnology products is highly competitive, and we face significant direct and indirect competition in several aspects of our business. Competition for improving plant genetics comes from conventional and advanced plant breeding techniques, as well as from the development of genetically modified traits. Other potentially competitive sources of improvement in crop yields include improvements in crop protection chemicals, fertilizer formulations, farm mechanization, other biotechnology, and information management. Programs to improve genetics and chemistry are generally concentrated within a relatively small number of large companies, while non-genetic approaches are underway with broader set of companies. Additionally, competition for providing more nutritious ingredients for food companies come from chemical-based ingredients, additives and substitutes, which are developed by various companies.

In general, we believe that we face competition from both large agricultural biotechnology, seed and chemical companies, certain of which have been actively involved in new trait discovery, development, and commercialization, and from specialty food ingredient companies, which are generally focused on providing solutions to the food industry through chemical, synthetic or other methods. Many of our competitors—particularly large chemical companies—have substantially larger budgets for research, development (R&D), product commercialization and regulatory process management than we do. Because of the breadth of the development programs of our competitors, it is possible that some of our competitors may in the future be our partners in certain projects.

We also face indirect competition from trait research and development companies as well as agricultural research universities and institutions. Given the global importance of agriculture, there are a number of companies, research universities and institutions that specialize in R&D of agricultural yield and product quality traits. Because these indirect competitors typically focus on a limited number of traits and do not generally have the product development, gene-editing technologies and regulatory infrastructure necessary to bring traits to market, they generally out-license trait technologies to large industry players with in-house development and regulatory capabilities at a relatively early stage of development.

We believe that the primary competitive factors in the seed industry are product development, product quality, performance, scale, price, and compliance with food safety standards. We believe that we are able to compete favorably based on the basis of our expertise and the precision, specificity, cost effectiveness and development speed of our proprietary technologies. Nevertheless, many of our current or potential competitors, either alone or with their R&D or collaboration partners, have significantly greater financial resources and expertise in R&D, manufacturing, testing and marketing approved products than we do.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products faster, with lower research costs or with more desirable traits than we can.

**Research and Development**

Our R&D team has technical expertise in genome engineering, molecular biology, biochemistry, genetics and genetic engineering, plant physiology and plant breeding. Our R&D activities are conducted principally at our Minnesota facilities and we also conduct breeding activities through third parties in the U.S., its territories and South America. We have made, and will continue to make, substantial investments in R&D. We incurred R&D expenses of $9.8 million in the year ended December 31, 2018, $11.6 million in the year ended December 31, 2017, and $5.6 million in the year ended December 31, 2016.

**Employees**

As of December 31, 2018, we employed 50 employees, 28 of whom are in R&D. Our multidisciplinary team includes experts in biology, chemistry, plant genetics, agronomics, data scientists, and other related fields. As

pioneers in the field of gene editing for plant sciences, members of our management team have invented TALEN, one of the premier gene-editing tools. None of our employees are represented by a labor union or covered by a collective bargaining agreement. We consider our relationship with our employees to be good.

**Information about Segment and Geographic Revenue**

As of December 31, 2018, we had not achieved commercial operations, accordingly no segment or geographic information has been provided.

**Corporate Information**

We were incorporated in Delaware on January 8, 2010 and our majority shareholder is Cellectis S.A. (*société anonyme*). Our principal executive offices are located at 2800 Mount Ridge Road, Roseville, MN 55113, United States of America, and our telephone number is +1 (651) 683-2807. We also maintain a website at www.calyxt.com. The information contained in, or that can be accessed through, our website is not part of this report.

**Available Information**

Our website, located at www.calyxt.com provides additional information about us. On our website, you can obtain, free of charge, this Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and all of our other filings with the SEC. Our recent press releases are also available on our website. Our website also contains important information regarding our corporate governance practices. Information contained on our website is not incorporated into this Current Report on Form 8-K. You may also read and copy any materials that we file with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Room 1580, Washington, D.C. 20549. You may obtain information on the Public Reference Room by calling the SEC at 1-800-SEC-0330. In addition, the SEC maintains a website that contains reports, proxy statements and other information that is filed electronically with the SEC. The website can be accessed at www.sec.gov.

## ITEM 1A. RISK FACTORS.

*This Annual Report on Form 10-K contains forward-looking information based on our current expectations. Because our business is subject to many risks and our actual results may differ materially from any forward-looking statements made by or on behalf of us, this section includes a discussion of important factors that could affect our business, operating results, financial condition and the trading price of our common stock. You should carefully consider these risk factors, together with all of the other information included in this Annual Report on Form 10-K as well as our other publicly available filings with the SEC.*

**Risks Related to Our Business and Operations**

***We have a limited operating history, which makes it difficult to evaluate our current business and future prospects and may increase the risk of investment.***

We are an early-stage gene-editing company with a limited operating history that to date has been focused primarily on R&D, conducting field trials, pursuing initial commercialization efforts and building our management team. Investment in agricultural biotechnology product development is a highly speculative endeavor. It entails substantial upfront R&D investment and there is significant risk that we will not be able to edit the genes in a particular plant to express a desired trait, or, once edited, we will not be able to replicate that trait across entire crops in order to commercialize the product candidate. Moreover, the regulatory pathway for our product candidates can be uncertain and could add significant additional cost and time to development. Although we achieved commercialization in the first quarter of 2019, we have not yet generated significant revenue from sales of these products.

Our limited operating history may make it difficult to evaluate our current business and our future prospects. We have encountered, and will continue to encounter, risks and difficulties frequently experienced by growing companies in rapidly developing and changing industries, such as the agricultural biotechnology industry, including challenges in forecasting accuracy, determining appropriate investments of our limited resources, gaining market acceptance of the products made using our gene-editing platform, managing a complex regulatory landscape and developing new product candidates. We may also face challenges in scaling our supply chain in a cost-effective manner, as we will rely on contracting with seed production companies, seed distributors, farmers, crushers, millers, refiners, and logistics and transportation providers, in order to get our products to market. Our current operating model may require changes in order for us to scale our operations efficiently. We may not be able to fully implement or execute on our business strategy or realize, in whole or in part within our expected time frames, the anticipated benefits of our growth strategies. You should consider our business and prospects in light of the risks and difficulties we face as an early-stage company focused on developing products in the field of agricultural biotechnology.

***We have incurred significant losses since our inception, and anticipate that we will continue to incur significant losses for the foreseeable future.***

Our net losses for the years ended December 31 were $27.9 million for 2018, $26.0 million for 2017 and $12.1 million for 2016. As of December 31, 2018, we had an accumulated deficit of $82.4 million. The amount of our future losses will depend, in part, on the pace and amount of our future expenditures and our ability to obtain funding through equity or debt financings, agreements with commercial partners, and on additional grants or tax credits. As of December 31, 2018, we had not launched a commercial product and did not have sales until the first quarter of 2019 for our High Oleic Soybean product candidate, and we do not expect potential commercial launch of our High Fiber Wheat product candidate before 2022. Following commercialization of our High Oleic Soybean, our sales will be limited to a single product and may be limited until we achieve operating scale. As a result, we expect to continue to incur significant expenses and operating losses for the foreseeable future. We anticipate that such expenses will increase substantially if and as we:

- establish a sales, marketing and distribution infrastructure, including relationships across our supply chain, to commercialize any products that have completed the development process;
- conduct additional field trials of our current and future product candidates;
- secure manufacturing arrangements for commercial production;
- continue to advance the R&D of our current and future product candidates;
- seek to identify and validate additional product candidates;
- acquire or in-license other product candidates, technologies, germplasm or other biological material;
- are required to seek regulatory and marketing approvals for our product candidates;
- make royalty and other payments under any in-license agreements;
- maintain, protect, expand and defend our intellectual property portfolio;
- seek to attract and retain new and existing skilled personnel; and
- experience any delays or encounter issues with any of the above.

The net losses we incur may fluctuate significantly from year-to-year and quarter-to-quarter, such that a period-to-period comparison of our results of operations may not be a good indication of our future performance. In any particular period or periods, our operating results could be below the expectations of securities analysts or investors, which could cause the price of our common stock to decline.

***We face significant competition and many of our competitors have substantially greater financial, technical and other resources than we do.***

The market for agricultural biotechnology products is highly competitive, and we face significant direct and indirect competition in several aspects of our business. Competition for improving plant genetics comes from conventional and advanced plant breeding techniques, as well as from the development of advanced

biotechnology traits. Other potentially competitive sources of improvement in crop yields include improvements in crop protection chemicals, fertilizer formulations, farm mechanization, other biotechnology, and information management. Programs to improve genetics and crop protection chemicals are generally concentrated within a relatively small number of large companies, while non-genetic approaches are underway with a broader set of companies. Mergers and acquisitions in the plant science, specialty food ingredient and agricultural biotechnology, seed and chemical industries may result in even more resources being concentrated among a smaller number of our competitors. Additionally, competition for providing more nutritious ingredients for food companies come from chemical-based ingredients, additives and substitutes, which are developed by various companies. The majority of these competitors have substantially greater financial, technical, marketing, sales, distribution and other resources than we do, such as larger R&D staff, more experienced marketing and manufacturing organizations and more well-established sales forces. As a result, we may be unable to compete successfully against our current or future competitors, which may result in price reductions, reduced margins and the inability to achieve market acceptance for our products. We expect to continue to face significant competition in the markets in which we intend to commercialize our products.

Many of our competitors engage in ongoing R&D, and technological developments by our competitors could render our products less competitive or obsolete, resulting in reduced sales compared to our expectations. Our ability to compete effectively and to achieve commercial success depends, in part, on our ability to: control manufacturing and marketing costs; effectively price and market our products; successfully develop an effective marketing program and an efficient supply chain; develop new products with properties attractive to food manufacturers or farmers; and commercialize our products quickly without incurring major regulatory costs. We may not be successful in achieving these factors and any such failure may adversely affect our business, results of operations and financial condition.

From time to time, certain seed and chemical companies that are potential competitors of ours may seek new traits or trait development technologies and may seek to license our technology. We have, in the past, entered into such licensing arrangements and may continue to enter into such arrangements in the future. Some of these companies may have significantly greater financial resources and may even compete with our business. In determining whether to license traits and/or trait development technologies to a potential competitor, we evaluate the potential financial benefits to us in addition to the focus of such companies' trait pipelines and the likelihood that their product candidate programs could compete with our own product candidate pipeline. Although we do not believe that any of our existing licenses pose a competitive threat to our business model or existing product candidate pipeline, in such circumstances, competitors could use our technologies to develop their own products that would compete with our product candidates.

We also anticipate increased competition in the future as new companies enter the market and new technologies become available, particularly in the area of gene editing. Our technology 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 revenue from the commercialization of our products. At the same time, the expiration of patents covering existing products reduces the barriers to entry for competitors.

***We rely on certain gene-editing technologies that may become obsolete in the future.***

We rely on our proprietary gene editing technologies to develop our product candidates. If our competitors are able to refine existing gene-editing technologies, or develop new gene-editing technologies that are, superior to our technologies, we may face reputational damage and a decline in the demand for our products. Our technologies may be rendered obsolete or uneconomical by technological advances or entirely different approaches developed by one or more of our competitors that are more effective or that enable them to develop and commercialize products more quickly or with lower expense than we are able to do. If for any reason our technology becomes obsolete or uneconomical relative to our competitors' technologies, this would prevent or limit our ability to generate revenues from the commercialization of our products.

***Our business activities are currently conducted at a limited number of locations, which makes us susceptible to damage or business disruptions caused by natural disasters or acts of vandalism.***

Our current headquarters and R&D facilities, which include an office, labs, greenhouses, field testing acreage, and a demonstration test kitchen, are located in Roseville, Minnesota. Our seed production takes place primarily in the United States and Argentina. Third party warehousing for seed storage, and our limited number of processing partners (*e.g.* storage, transportation, crushers and refiners) are all located in the Upper Midwest region of the United States. 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 hurricane, drought, fire, flood, tornado, earthquake, or acts of vandalism, could cause substantial delays in our operations, damage or destroy our equipment, inventory or development projects, and cause us to incur additional expenses.

***Loss of or damage to our germplasm libraries or inability to access new germplasm would significantly slow our product development efforts.***

We have access to a collection of germplasm for our product candidates, in part, through licensing agreements with leading institutions. Germplasm comprises genetic material 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 plant breeding programs. To the extent that we lose access to germplasm because of the termination or breach of our licensing agreements or as a result of insufficient quantities of germplasm or are unable to access new germplasm for testing, breeding and commercial use in relevant geographies, our product development capabilities could be negatively impacted. In addition, loss of or damage to our germplasm or our inability to access new germplasm would significantly impair our R&D activities.

***Our product development efforts use complex integrated technology platforms and require substantial time and resources; these efforts may not be successful, or the rate of product improvement may be slower than expected.***

Development of successful agricultural products using gene-editing technologies requires significant levels of investment in R&D, including laboratory, greenhouse and field testing, to demonstrate product effectiveness and can take several years or more. We incurred R&D expenses, including non-cash stock compensation expense, of $9.8 million in the year ended December 31, 2018, $11.6 million in the year ended December 31, 2017, and $5.6 million in the year ended December 31, 2016. We intend to continue to invest in R&D, including additional and expanded field testing, to validate our product candidates in real world conditions. Our investment in R&D may not result in significant product revenue over the next several years, if ever. Moreover, the successful application of gene-editing technologies can be unpredictable, and may prove to be unsuccessful when attempting to achieve desired traits in different crops and plants. For example, our gene-editing techniques may prove to be unsuccessful very early on during the discovery phase of new crop development based on technology limitations. Alternatively, even though we successfully implemented gene edits during the discovery phase, that trait may not ultimately appear in crops during field testing or crops may also exhibit other undesirable traits that adversely affect their commercial value.

Development of new or improved agricultural products involves risks of failure inherent in the development of products based on innovative and complex technologies. These risks include the possibility that:

- our products may not perform as expected in the field;
- our products may not receive necessary regulatory permits and governmental clearances in the markets in which we intend to sell them;
- consumer preferences, which are unpredictable and can vary greatly, may change quickly, making our products no longer desirable;
- our competitors may develop new products that taste better or have other more appealing characteristics than our products;

- our products may be viewed as too expensive by food companies or farmers as compared to competitive products;
- our products may be difficult to produce on a large scale or will not be economical to grow;
- intellectual property and other proprietary rights of third parties may prevent us, our R&D partners, or our licensees from marketing and selling our products;
- we may be unable to patent or otherwise obtain intellectual property protection for our discoveries in the necessary jurisdictions;
- we or the food manufacturers that we sell our ingredients to may be unable to fully develop or commercialize products containing our products in a timely manner or at all; and
- third parties may develop superior or equivalent products.

The field of gene editing, particularly in the area of plants, is in its infancy. Negative developments in the field of gene editing, such as adverse side effects, could harm the reputation of the industry and negatively impact our business.

***We may direct our limited resources toward product candidates that prove to be less profitable or less successful than others that we did not pursue.***

We have limited financial and managerial resources. As a result, we may forego or delay pursuit of opportunities with other product candidates that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future R&D programs and product candidates may not yield any commercially viable products.

***Any partnerships that we may enter into in the future may not be successful, which could adversely affect our ability to develop and commercialize our product candidates.***

We may seek R&D partnerships or joint venture arrangements with third parties for the development or commercialization of our product candidates depending on the merits of retaining commercialization rights for ourselves as compared to entering into partnerships or joint venture arrangements. We will face, to the extent that we decide to enter into partnerships or joint venture agreements, significant competition in seeking appropriate partners. Moreover, partnerships or joint venture arrangements are complex and time-consuming to negotiate, document, implement and maintain. We may not be successful in our efforts to establish and implement partnerships, joint ventures, or other alternative arrangements should we so chose to enter into such arrangements. The terms of any partnerships, joint ventures, or other arrangements that we may establish may not be favorable to us.

Any future partnerships or joint ventures that we enter into may not be successful. The success of our partnerships or joint venture arrangements will depend heavily on the efforts and activities of our partners. Partnerships and joint ventures are subject to numerous risks, which may include that:

- partners have significant discretion in determining the efforts and resources that we will apply to R&D partnerships or joint ventures;
- partners may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization programs based on trial results, changes in their strategic focus due to the acquisition of competitive products, availability of funding or other external factors, such as a business combination that diverts resources or creates competing priorities;
- partners may delay trials, provide insufficient funding for a trial program, stop a trial, abandon a product candidate, repeat or conduct new trials or require a new formulation of a product candidate for testing;
- partners could independently develop, or develop with third parties, products that compete directly or indirectly with our products or product candidates;
- a partner with marketing, manufacturing and distribution rights to one or more products may not commit sufficient resources to or otherwise not perform satisfactorily in carrying out these activities;
- we could grant exclusive rights to our partners that would prevent us from collaborating with others;

- partners may not properly maintain or defend our intellectual property rights or may use our intellectual property or proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential liability;
- disputes may arise between us and a partner that causes the delay or termination of the research, development or commercialization of our current or future products or that results in costly litigation or arbitration that diverts management attention and resources;
- partnerships may be terminated, and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable current or future products;
- partners may own or co-own intellectual property covering our products that results from our partnering with them, and in such cases, we would not have the exclusive right to develop or commercialize such intellectual property; and
- a partner's sales and marketing activities or other operations may not be in compliance with applicable laws resulting in civil or criminal proceedings.

***If ongoing or future field trials are unsuccessful, we may be unable to complete the development of product candidates on a timely basis or at all.***

We rely on field trials to demonstrate the efficacy of the product candidates that we have developed and evaluated in greenhouse conditions. Field trials allow us to test the product candidates in the field as well as to increase seed production, and to measure performance across multiple geographies and conditions. The successful completion of field trials is critical to the success of our product development efforts with respect to our product candidates. If our ongoing or future field trials are unsuccessful or produce inconsistent results or unanticipated adverse effects on the agronomic performance of our crops, or if the field trials do not produce reliable data, our product development efforts could be delayed, subject to additional regulatory review or abandoned entirely. In addition, in order to support our commercialization efforts, it is necessary to collect data across multiple growing seasons and from different geographies. Even in cases where initial field trials are successful, we cannot be certain that additional field trials conducted on a greater number of acres or in different geographies will also be successful. Many factors that are beyond our control may adversely affect the success of these field trials, including unique geographic conditions, weather and climatic variations, disease or pests, or acts of protest or vandalism. Field trials, which may take up to 2–3 years, are costly, and any field trial failures that we may experience may not be covered by insurance and, therefore, could result in increased costs, which may negatively impact our business and results of operations.

***We rely on third parties to conduct, monitor, support, and oversee field trials and other research services for product candidates in development, and any performance issues by third parties, or our inability to engage third parties on acceptable terms, may impact our ability to successfully commercialize such product candidates.***

We currently rely on third parties, such as growers, consultants, contractors and universities, to conduct, monitor, support and oversee these field trials. In some cases, these field trials are conducted outside of the United States, making it difficult for us to monitor the daily activity of the work being conducted by the third parties that we engage. Although we provide our third-party contractors with protocols regarding the production and handing of our product candidates, we have limited control over the execution of field trials. Poor field trial execution or data collection, failure to follow required agronomic practices, protocols or regulatory requirements, or mishandling of product candidates by these third parties could impair the success of our field trials. Any such failures may result in delays in the development of our product candidates or the incurrence of additional costs. Even if our third-party contractors adhere to our suggested protocols, field trials may fail to succeed for a variety of other reasons, including weather, disease or pests, improper timing of planting our seeds, or incorrect fertilizer use. Ultimately, we remain responsible for ensuring that each of our field trials is conducted in accordance with the applicable protocol and legal, regulatory and scientific standards, and our reliance on third parties does not relieve us of our responsibilities. Should such third parties fail to comply with these standards, our ability to develop our product candidates could be adversely impacted.

Additionally, if we are unable to maintain or enter into agreements with third-party contractors on acceptable terms, or if engagement is terminated prematurely, we may be unable to conduct or complete our field trials in the manner we anticipate. If our relationship with any of these third-party contractors is terminated, we may be unable to enter into arrangements with alternative contractors on commercially reasonable terms, or at all. Switching or adding third-party contractors can involve substantial cost and require extensive management time and focus. In addition, there is a natural transition period when any new third party commences field trial work. As a result, delays may occur, which could materially impact our ability to meet our desired development timelines.

***We may lack the necessary expertise, personnel and resources to successfully commercialize our products.***

Other than our High Oleic Soybean, our product candidates are still in development, and there is no established market for them. Completion of development for these product candidates could be protracted, and there is no certainty of success. Moreover, we expect to price our products based on our assessment of the value that we believe they will provide to food manufacturers or farmers, rather than on the cost of production. If food manufacturers or farmers attribute a lower value to our products than we do, they may not be willing to pay the premium prices that we expect to charge. Pricing levels may also be negatively affected if our products are unsuccessful in producing the yields or traits we expect. Food manufacturers or farmers may also be cautious in their adoption of new products and technologies, with conservative initial purchases and proof of product required prior to widespread deployment. It may take several growing seasons for food manufacturers or farmers to adopt our products on a large scale, if at all.

To achieve commercial success of our product candidates, we will need to develop and build-out our own sales and marketing capabilities while we intend to outsource our supply capabilities to third parties. Factors that may affect our ability to commercialize our product candidates on our own include recruiting and retaining adequate numbers of effective sales and marketing personnel, obtaining access to or persuading adequate numbers of food manufacturers or farmers to purchase and use our product candidates and other unforeseen costs associated with creating an independent sales and marketing organization. Developing and maintaining a sales and marketing organization requires significant investment, is time-consuming and could delay the launch of our product candidates. We may not be able to build or maintain an effective sales and marketing organization in North America or other key global markets. If we are unable to find suitable partners for the commercialization of our product candidates, we may have difficulties generating revenue from them.

***The successful commercialization of our products depends on our ability to produce high-quality plants and seeds cost-effectively on a large scale and to accurately forecast demand for our products, and we may be unable to do so.***

The production of commercial-scale quantities of seeds requires the multiplication of the plants or seeds through a succession of plantings and seed harvests. The cost-effective production of high-quality, high-volume quantities of any product candidates we successfully develop depends on our ability to scale our production processes to produce plants and seeds in sufficient quantity to meet demand. For example, food ingredients such as soybean oil and wheat flour will require optimized production and commercialization of the underlying plant and seed harvests. We cannot assure that our existing or future seed production techniques will enable us to meet our large-scale production goals cost-effectively for the products in our pipeline. Even if we are successful in developing ways to increase yields and enhance quality, we may not be able to do so cost-effectively or on a timely basis, which could adversely affect our ability to achieve profitability. If we are unable to maintain or enhance the quality of our plants and seeds as we increase our production capacity, including through the

expected use of third parties, we may experience reductions in food manufacturer or farmer demand, higher costs and increased inventory write-offs.

In addition, because of the length of time it takes to produce commercial quantities of marketable seeds, we will need to make seed production decisions well in advance of product sales. Our ability to accurately forecast demand can be adversely affected by a number of factors outside of our control, including changes in market conditions, environmental factors, such as pests and diseases, and adverse weather conditions. A shortfall in the supply of our products may reduce product revenue, damage our reputation in the market and adversely affect relationships. Any product surplus we have on hand may negatively impact cash flows, reduce the quality of our inventory and ultimately result in write-offs of inventory. Additionally, we will take financial risk in our inventory given that we will have to keep the inventory marked to market on our balance sheet. Fluctuations in the spot price of our crops in inventory could have negative impacts on our financial statements. Any failure on our part to produce sufficient inventory, or overproduction of a particular product, could harm our business, results of operations and financial condition. In addition, food manufacturers or farmers may cancel orders or request a decrease in quantity at any time prior to delivery of the plants or seeds, which may lead to a surplus of our products.

While we estimate that the potential size of our target markets for our products is significant, that estimate has not been independently verified and is based on certain assumptions that may not prove to be accurate. As a result, these estimates could differ materially from actual market sizes, which could result in decreased demand for our products and therefore adversely impact our future business prospects, results of operation and financial condition.

***We will rely on contractual counterparties and they may fail to perform adequately.***

Our commercial strategy depends on our ability to contract with counterparties that provide, and in the future may provide, a variety of services, including seed production companies, seed distributors, farmers, crushers, refiners, millers, transportation and logistics companies and lab equipment service providers. We plan to rely on these third parties to provide services along our supply chain and in our R&D functions. We may face challenges in establishing relationships and contracts with these parties, which may jeopardize our ability to build a supply chain. While we have established relationships with several providers, we face the possibility that counterparties may not fulfill the terms of our agreements and will be required to enter into additional relationships to meet our business objectives. This may cause disruptions in our supply chains, research efforts, commercialization efforts, and otherwise inhibit our ability to bring our products to market at the times and in the quantities as planned. For example, if our crushers and refiners fail to process our crops at the times and at the quantities as agreed, we may be unable to meet the demands of food manufacturers who we have contracted with to purchase our products, leading to lower sales and potential reputational damage and contractual liabilities. While we may have certain indemnification rights in our contracts with such counterparties, there is no assurance that such indemnification rights will be sufficient to cover any damage to us that would result from a failure of such a counterparty in their contractual arrangements with us.

***Interruptions in the production or transportation of our seeds could adversely affect our operations and profitability.***

In some cases, we may produce seed with respect to our product candidates and we will rely on contract seed producers for such seed production. Poor execution, failure to follow required agronomic practices, protocols or regulatory requirements, or mishandling of product candidates by these contract seed producers could adversely affect our products. Any such failures may result in delays in our ability to obtain seed for our seed production needs in a timely manner. Such delays could adversely affect our ability to deliver seed to farmers to meet their planting window. Our dependency upon timely seed deliveries means that interruptions or stoppages in such deliveries, or delays or limitations with respect to seed production, could adversely affect our operations until alternative arrangements could be made. Such a delay would adversely affect our reputation and revenues. If we

were unable to produce the necessary seed for an extended period of time for any reason, our business, customer relations, and operating results could suffer.

We may not be able to identify suitable seed producers to meet our production needs. If we do identify suitable seed producers, we may not be able to enter into cost effective agreements on acceptable terms. If any contract seed producers whom we engage fail to perform their obligations as expected or breach or terminate their agreements with us, or if we are unable to secure the services of such third parties when and as needed, we may lose opportunities with our supply chain.

***The unintended presence of our traits in other products or plants may negatively affect us.***

Trace amounts of our traits may unintentionally be found in the products of third parties, which may result in negative publicity and claims of liability brought by such third parties or others against us. Furthermore, in the event of an unintended dissemination of our gene-edited germplasm into the environment, or the presence of unintended trace amounts of our traits in conventional seed, or in the grain or products produced from conventional crops, we could be subject to claims by multiple parties, including environmental advocacy groups, as well as governmental actions such as mandated crop destruction, product recalls, or additional stewardship practices and environmental cleanup or monitoring.

***Our crops are new, and if farmers and food processors are unable to work effectively with our crops, our various relationships, our reputation and our results of operations will be harmed.***

We plan to provide farmers with information and protocols regarding the establishment, management, harvest, transportation and storage of our crops. These crop management recommendations may include equipment selection, planting and harvest timing, application of crop protection chemicals and storage systems and protocols. Our general or specific protocols may not apply in all circumstances, may be improperly implemented, may not be sufficient, or may be incorrect, leading to reduced yields, crop failures or other production problems or losses. If farmers that are producing crops for our food ingredients experience these challenges, we may be unable to provide product ingredients to food manufacturers on a timely basis or at all. If we are unable to deliver products in a timely basis or at all, or if farmers that are purchasing our seed experience these challenges, or if our food processors are unable to process our crops effectively and efficiently, we may jeopardize our relationships, reputation and ability to successfully market our products. Further, the use of our seeds may require a change in current planting, rotation or agronomic practices, which may be difficult to implement or may discourage the use of our products by agricultural producers.

There are various reasons why our crops, once available, may not succeed, including weather, disease or pests, improper timing of planting our seeds, or incorrect fertilizer or herbicide use. Statements by potential customers about negative experiences with our products could harm our reputation, and the decision by these parties not to proceed with large-scale seed purchases could harm our business, revenue and ability to achieve profitability.

***The successful commercialization of our products may face challenges from public perceptions of gene-edited products and ethical, legal, environmental, health and social concerns.***

The successful commercialization of our product candidates depends, in part, on public acceptance of gene-edited agricultural products.

Farmers, seed companies and end-product consumers may not understand the nature of our technologies or the scientific distinction between our non-transgenic gene-edited products and transgenic products of competitors. As a result, these parties may transfer negative perceptions and attitudes regarding transgenic products to our products and product candidates. A lack of understanding of our technologies may also make consumers more susceptible to the influence of negative information provided by opponents of biotechnology. Some opponents of biotechnology actively seek to raise public concern about gene editing, whether transgenic or non-transgenic, by

claiming that plant products developed using biotechnology are unsafe for consumption or their use, pose a risk of damage to the environment, or creates legal, social and ethical dilemmas. The commercial success of our products and product candidates may be adversely affected by such claims, even if unsubstantiated. In addition, extreme opponents of biotechnology have vandalized the fields of farmers planting biotech seeds and facilities used by biotechnology companies. Any such acts of vandalism targeting the fields of our farmer customers, our field-testing sites or our research, production or other facilities, could adversely affect our sales and our costs.

Negative public perceptions about gene editing can also affect the regulatory environment in the jurisdictions in which we are targeting the sale of our products and the commercialization of our product candidates. Any increase in such negative perceptions or any restrictive government regulations in response thereto, could have a negative effect on our business and may delay or impair the sale of our products or the development or commercialization of our product candidates. Even in light of compliance with stringent, existing regulatory protocols or following receipt of confirmation of non-regulated status in a jurisdiction, public pressure in that jurisdiction may lead to increased regulation of products produced using biotechnology, further legislation regarding novel trait development technologies, or administrative litigation concerning prior regulatory determinations, each of which could adversely affect our ability to sell our product or commercialize our product candidates. In addition, labeling requirements in effect from time to time could heighten public concerns and make consumers less likely to purchase food products containing gene-edited ingredients.

***Products that we develop, and food containing our products, may fail to meet standards established by third-party non-GMO verification organizations, which could reduce the value of our products to customers.***

Certain third-party organizations offer verification programs that seek to identify non-GMO products to consumers. These organizations verify the status of products (such as foods, beverages and vitamins) as non-GMO based on independently developed standards, and often authorize the display of specific markers or labels illustrating such status on the verified product's packaging. Although the verification programs seek to identify finished products as non-GMO verified, the processes that they employ typically examine the individual ingredients and precursors, rather than the finished products. Standards established by such third-party organizations for the verification of non-GMO status may differ from applicable regulatory legal standards applied by regulators in the United States. As a result, notwithstanding a determination as to the non-regulated status of our products pursuant to APHIS's regulatory procedures (or a similar determination in other jurisdictions), our products, and third-party products that utilize our gene-edited products as ingredients, may fail to meet more restrictive or non-scientific standards imposed by these independent verification organizations. For example, a third-party verification organization could determine that it will withhold its non-GMO verification from any product developed using any biotechnology whatsoever.

If third-party verification organizations were to determine that any of our products, or third-party products that utilize our products as ingredients, or gene-edited products generally, did not meet their non-GMO verification standards, and certified non-GMO seals or labels were not available for such products, our reputation could be harmed, these products may be unable to demand non-GMO premiums, which could reduce the value of our traits to farmer customers, and our operating results could be adversely affected.

***The commercial success of our consumer-centric products is reliant on the needs of food manufacturers and the recognition of shifting consumer preferences.***

The commercial success of our consumer-centric products will depend in part on the success of the food manufacturer's products that our products are included in. We will not control the marketing, distribution, labeling or any other aspects of the sale and commercialization of the food manufacturers' food products in which our products are an ingredient. Consumer preferences may be a significant driver in the success of our food manufacturer customers in their efforts to sell foods products including our products. While current trends indicate that consumer preferences may be moving towards "healthier" options, we cannot predict whether such trends will continue or which types of food products will be demanded by consumers in the future. Additionally,

as health and nutritional science continues to progress, consumer perception of what foods, nutrients and ingredients are considered "healthy" may shift. We and our food manufacturer customers may not be dynamic enough in responding to consumer trends and making products that will be demanded by consumers in the future. Failure by our food manufacturer customers to successfully recognize consumer trends and commercialize and sell their products which contain our ingredients could lower demand for our products and harm our business, results of operations and financial condition.

***Farmers may not recognize the value in our products.***

The commercial success of our products will rely on convincing farmers to grow them. Farmers may opt to use other seed products in the market, which may lead to a reduction in demand for ours.

***If we are sued for defective products and if such lawsuits were determined adversely, we could be subject to substantial damages, for which insurance coverage is not available.***

We may be held liable if any product we develop, or any product that uses or incorporates any of our technologies is found unsuitable during marketing, sale or consumption. For example, the detection of an unintended trait in a commercial seed variety or the crops and products produced may result in governmental actions such as mandated crop destruction, product recalls or environmental cleanup or monitoring. Concerns about seed quality could also lead to additional regulations being imposed on our business, such as regulations related to testing procedures, mandatory governmental reviews of biotechnology advances, or additional regulations relating to the integrity of the food supply chain from the farm to the finished product.

***We may need to raise additional funding, which may not be available on acceptable terms or at all. Failure to obtain this necessary capital when needed may force us to delay, limit or terminate our product development efforts or other operations.***

The process of developing and commercializing product candidates is lengthy, risky and expensive. We expect our R&D expenses to increase substantially as we continue to develop our existing product candidates and identify new product candidates for development. As a result, our selling, general and administrative expense will also increase significantly.

As of December 31, 2018, we had cash and cash equivalents of approximately $93.8 million. We believe our cash and cash equivalents will be sufficient to fund our operations through at least early 2021. However, in order to complete the development process, obtain, to the extent necessary, any regulatory approval for, and commercialize our products, we may require additional funding. Also, our operating plan, including our product development plans, may change as a result of many factors currently unknown to us, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings, government or other third-party funding, marketing and distribution arrangements and other strategic alliances and licensing arrangements, or a combination of these approaches. To commercialize our products, we will require significant working capital to operate our business and maintain our supply chain. To the extent that we raise additional capital through the sale of additional equity or convertible securities, current ownership interests may be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of a stockholder. Debt financing, if available, would result in increased fixed payment obligations and a portion of our operating cash flows, if any, being dedicated to the payment of principal and interest on such indebtedness. In addition, debt financing may involve agreements that include restrictive covenants that impose operating restrictions, such as restrictions on the incurrence of additional debt, the making of certain capital expenditures or the declaration of dividends. To the extent we raise additional funds through arrangements with R&D partners or otherwise, we may be required to relinquish some of our technologies, product candidates or revenue streams, license our technologies or product candidates on unfavorable terms, or otherwise agree to terms unfavorable to us. Any additional fundraising efforts may divert our management from their day-to-day activities, which may adversely affect our ability to develop and commercialize our product candidates. In addition, we cannot

guarantee that future financing will be available in sufficient amounts or on terms acceptable to us, if at all. Even if we believe we have sufficient funds for our current or future operating plans, we may seek additional capital if market conditions are favorable or in light of specific strategic considerations. If we are unable to obtain funding on a timely basis, we may be required to significantly curtail, delay or discontinue one or more of our research or product candidate development programs or the commercialization of any product candidate or be unable to expand our operations or otherwise capitalize on our business opportunities, as desired, which could materially affect our business, operating results and prospects and cause the price of the common stock to decline.

***Recent U.S. tax legislation could adversely affect our business and financial condition***

On December 22, 2017, U.S. tax reform legislation known as the Tax Cuts and Jobs Act (the TCJA) was signed into law. The TCJA makes substantial changes to U.S. tax law, including a reduction in the corporate tax rate, a limitation on deductibility of interest expense, a limitation on the use of net operating losses to offset future taxable income (as further discussed below), the allowance of immediate expensing of capital expenditures, the modification or repeal of certain business deductions and credits, deemed repatriation of foreign earnings and significant changes to the taxation of foreign earnings going forward, and new rules designed to prevent erosion of the U.S. income tax base (such as a new minimum tax, called the Base Erosion and Anti-abuse Tax, applicable to certain U.S. corporations that make certain payments to related foreign persons). The full extent of the impact remains uncertain at this time, and our current interpretations of, and assumptions regarding, the TCJA are subject to additional regulatory or administrative developments, including any regulations or other guidance promulgated by the U.S. Internal Revenue Service, or IRS, and other regulators. The TCJA contains numerous, complex provisions impacting U.S. companies, and we continue to review and assess the legislative language and guidance promulgated by the IRS and other regulators to determine the TCJA's full impact on us. Further, we can provide no assurance our current interpretations of, and assumptions regarding, the TCJA and any related regulations or guidance will not be reviewed or investigated by regulators in the future. We urge our stockholders to consult with their tax advisors with respect to the TCJA and the potential tax consequences of investing in our common stock.

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

As of December 31, 2018, we had approximately $85.5 million of net operating losses, or NOLs, for federal and state income tax purposes, which may be available to offset income tax liabilities in the future. In addition, we may generate additional NOLs in future years. Under Section 382 of the Internal Revenue Code of 1986 (as amended, the Code), a corporation that undergoes an "ownership change" is subject to limitations on its ability to utilize its pre-change NOLs to offset future taxable income. For this purpose, an ownership change generally means a more than 50 percentage point change in the ownership of a corporation by one or more stockholders or specified groups of stockholders, each of which owns 5% or more of the corporation (determined after the application of certain attribution and grouping rules) over a three-year period. Although we do not believe that any of our NOLs are currently subject to limitation under Section 382 of the Code, future changes in our stock ownership, some of which may be outside of our control, could result in an ownership change under Section 382 of the Code, which could limit our ability to use our existing or future NOLs to offset future taxable income. In addition, for an NOL that was generated in the 2017 taxable year or in an earlier taxable year, we are permitted to carry forward the NOL from the taxable year in which it arose only to the succeeding twenty taxable years, and, if we do not generate sufficient taxable income to utilize the NOL carryforward within this period, it may expire unused. NOLs generated in taxable year 2018 and future years have indefinite carryforward periods.

The TCJA contains significant changes to the rules regarding NOLs. These changes include limiting the deduction of NOLs to 80% of current year taxable income, prohibiting the carryback of NOLs, and allowing NOLs to be carried forward indefinitely. These changes apply to NOLs arising in taxable years beginning after December 31, 2017, and therefore our ability to use such NOLs to offset any future taxable income may be significantly limited. In addition, the reduction in the federal corporate tax rate under the TCJA potentially diminishes the value of our NOLs to us. Historically, we have established a full valuation allowance for deferred

tax assets due to the uncertainty that enough taxable income will be generated in the taxing jurisdiction to utilize the assets. Therefore, we do not expect changes to the rules regarding NOLs under the TCJA to have a material impact on our financial statements for the year ending December 31, 2018, as all net deferred tax assets are fully reserved.

**Risks Related to Our Industry**

***The overall agricultural industry is susceptible to commodity price changes and we, along with our food manufacturing customers and farmer customers, are exposed to market risks from changes in commodity prices.***

Changes in the prices of certain commodity products could result in higher overall cost along the agricultural supply chain, which may negatively affect our ability to commercialize our products. We will be susceptible to changes in costs in the agricultural industry as a result of factors beyond our control, such as general economic conditions, seasonal fluctuations, weather conditions, demand, food safety concerns, product recalls and government regulations. As a result, we may not be able to anticipate or react to changing costs by adjusting our practices, which could cause our operating results to deteriorate. While we enter into supply agreements for grain and seed production with settlement values based on commodity market futures pricing, we do not engage in hedging or speculative financial transactions nor do we hold or issue financial instruments for trading purposes.

***Adverse weather conditions, natural disasters, crop disease, pests and other natural conditions can impose significant costs and losses on our business.***

The ability to grow our products is vulnerable to adverse weather conditions, including windstorms, floods, drought and temperature extremes, which are quite common but difficult to predict, the effects of which may be influenced and intensified by ongoing global climate change. Unfavorable growing conditions can reduce both crop size and crop quality. This risk is particularly acute with respect to regions or countries in which we plan to source a significant percentage of our products. In extreme cases, entire harvests may be lost in some geographic areas. Such adverse conditions can increase costs, decrease revenues and lead to additional charges to earnings, which may have a material adverse effect on our business, financial position and results of operations.

The ability to grow our products is also 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, climatic conditions and the risks associated with ongoing global climate change. The costs to control disease and other infestations vary depending on the severity of the damage and the extent of the plantings affected. Moreover, there can be no assurance that available technologies to control such infestations will continue to be effective. These infestations can also increase costs, decrease revenues and lead to additional charges to earnings, which may have a material adverse effect on our business, financial position and results of operations.

***We expect our business will be highly seasonal and subject to weather conditions and other factors beyond our control, which may cause our sales and operating results to fluctuate significantly.***

The sale of plant products is dependent upon planting and growing seasons, which vary from year to year, and are expected to result in both highly seasonal patterns and substantial fluctuations in quarterly sales and profitability. Furthermore, significant fluctuations in market prices for agricultural inputs and crops could also have an adverse effect on the value of our products. Weather conditions and natural disasters, such as heavy rains, hurricanes, hail, floods, tornadoes, freezing conditions, drought or fire, also affect decisions by food manufacturers or farmers about the types and amounts of seeds to plant and the timing of harvesting and planting such seeds, as well as adversely impact the agricultural industry as a whole in various regions. Disruptions that cause delays by food manufacturers or farmers in harvesting or planting can result in the movement of orders to a future quarter. Disruptions that cause delays by our farmers in harvesting could create us to be delayed, or to fail entirely in delivering food ingredients to food manufacturers. Any of those delays or failures would negatively affect the quarter in which they occur and cause fluctuations in our operating results.

**Risks Related to Regulatory and Legal Matters**

***The regulatory environment in the United States for genetically engineered products is uncertain and evolving. Changes in the current application of these laws and regulations would have a significant adverse impact on our ability to develop and commercialize our products.***

Changes in applicable regulatory requirements could result in a substantial increase in the time and costs associated with developing our products and negatively impact our operating results. In the United States, the USDA regulates, among other things, the introduction (including the importation, interstate movement, or release into the environment such as field testing) of organisms and products altered or produced through genetic engineering that are plant pests or that there is reason to believe are plant pests. Such organisms and products are considered regulated articles. However, a petitioner may submit a request for a determination by the USDA of nonregulated status for a particular article. A petition for determination of nonregulated status must include detailed information, including relevant experimental data and publications, and a description of the genotypic differences between the potentially regulated article and the nonmodified recipient organism, among other things. We previously submitted a request for a determination of nonregulated status to the USDA for our potato product candidates, our high oleic and low linolenic soybean product candidates, our improved quality alfalfa product candidate and our powdery mildew resistant wheat product candidate. The USDA confirmed in writing that each of these product candidates is not deemed to be a regulated article under the Plant Protection Act because it does not contain genetic material from plant pests. In the event any of our product candidates are found to contain inserted genetic material or otherwise differ from the descriptions we have provided to the USDA, the USDA could determine that such product candidates are regulated articles, which would require us to comply with the permit and notification requirements of the Plant Protection Act. While we believe that the USDA's reasoning will continue to extend to our other product candidates, we have not obtained a determination from the USDA that any of our other product candidates are not regulated articles under these regulations. USDA's regulations also require that companies obtain a permit or file a notification before engaging in the introduction (including the importation, interstate movement, or release into the environment such as field testing) of regulated articles. We cannot predict whether advocacy groups will challenge existing regulations and USDA determinations or whether the USDA will alter the manner in which it interprets its own regulations or institutes new regulations, or otherwise modifies regulations in a way that will subject our products to more burdensome standards, thereby substantially increasing the time and costs associated with developing our product candidates. Moreover, we cannot provide any assurance that the USDA will apply this same analysis to any of our other product candidates in development. Complying with USDA's plant pest regulations, including permitting requirements, is a costly, time-consuming process and could substantially delay or prevent the commercialization of our products.

On December 20, 2018, the USDA announced the National Bioengineered Food Disclosure Standard (the Standard). The National Bioengineered Food Disclosure Law, passed by Congress in July 2016, directed USDA to establish this national mandatory standard for disclosing foods that may or may not be bioengineered. The implementation date is January 1, 2020 (January 1, 2021 for small food manufacturers), with mandatory compliance by January 1, 2022. The Standard requires food manufacturers, importers, and certain retailers to ensure bioengineered foods are appropriately disclosed. The impact of the standard remains to be seen; our preliminary analysis and understanding is that gene edited foods do not fall within the definition of bioengineered under the Standard.

Our products may also be subject to extensive FDA food product regulations. Under sections 201(s) and 409 of the Federal Food, Drug, and Cosmetic Act, (FDCA), any substance that is reasonably expected to become a component of food is a food additive, and is therefore subject to FDA premarket review and approval, unless the substance is generally recognized, among qualified experts, as having been adequately shown to be safe under the conditions of its intended use, or GRAS, or unless the use of the substance is otherwise excluded from the definition of a food additive. Any food that contains an unsafe food additive is considered adulterated under section 402(a)(2)(C) of the FDCA. The FDA may classify some or all of our product candidates as containing a food additive that is not GRAS or otherwise determine that our products contain significant compositional

differences from existing plant products that require further review. Such classification would cause these product candidates to require pre-market approval, which could delay the commercialization of these products. In addition, the FDA is currently evaluating its approach to the regulation of gene-edited plants. For example, on January 18, 2017, the FDA announced a Request for Comments, or RFC, seeking public input to help inform its regulatory approach to human and animal foods derived from plants produced using gene editing. Among other things, the RFC asks for data and information in response to questions about the safety of foods from gene-edited plants, such as whether categories of gene-edited plants present food safety risks different from other plants produced through traditional plant breeding. If the FDA enacts new regulations or policies with respect to gene-edited plants, such policies could result in additional compliance costs and/or delay the commercialization of our product candidates, which could negatively affect our profitability. Any delay in the regulatory consultation process, or a determination that our products do not meet regulatory requirements, by the FDA could cause a delay in the commercialization of our products, which may lead to reduced acceptance by food manufacturers, farmers or the public and an increase in competitor products that may directly compete with ours.

***The regulatory environment outside the United States varies greatly from region to region and is less developed than in the United States.***

The regulatory environment around gene editing 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 technologies, this may limit our ability to expand into other global markets.

The two leading jurisdictions, the United States and the EU, do, and may continue to in the future, have distinctly different regulatory regimes with different rules and requirements. We cannot predict how the global regulatory landscape regarding gene editing in plants for food ingredients will evolve and may incur increased regulatory costs as regulations in the jurisdictions in which we operate change.

In the EU, GMOs and genetically modified food and feed products can only be sold in the market once they have been properly authorized. The procedures for evaluation and authorization of GMOs and genetically modified food and feed products are established by Regulation (EC) 1829/2003 on genetically modified food and feed and Directive 2001/18/EC on the release of GMOs into the environment. An application for authorization must be submitted under Directive 2001/18/EC if a company seeks to release GMOs for experimental purposes (e.g., field tests) and/or to sell GMOs, as such or in products, in the market (e.g., cultivation, importation or processing). In turn, an application for authorization must be submitted under Regulation (EC) 1829/2003 if a company seeks to sell GMOs in the market for food and feed use and/or food and feed products containing or produced from GMOs. At the national level, EU member states have the ability to restrict or prohibit GMO cultivation in their territories by invoking grounds such as environmental or agricultural policy objectives, town and country-planning, land use, coexistence, socio-economic impacts or public policy.

In addition, Directive 2001/18/EC, Regulation (EC) 1829/2003 and Regulation (EC) 1830/2003 establish specific labeling and traceability requirements for GMOs and products that contain or are produced from GMOs. Finally, Directives 2002/53/EC and 2002/55/EC require genetically modified varieties to be authorized before they can be included in a Common Catalogue of Varieties, which would permit the seeds of such genetically modified varieties to be marketed in the EU.

A recent ruling of the European Court of Justice (ECJ) in July 2018 clarified that only mutagenesis techniques which (a) have been used in a number of applications and (b) have a long safety record, can be exempted from these requirements, although EU member states remain free to subject even such exempted organisms to the obligations under Directive 2001/18/EC, or to other obligations. The impact of this ruling on, and the ultimate treatment by the EU of, products produced using other advanced plant breeding techniques is not yet known and the final determination could have a negative impact on our business.

Complying with such EU rules, as strictly interpreted by the ECJ, including the pre-market risk assessment and product authorization requirements, is extremely costly and time-consuming, and has no guarantee of success and could therefore substantially delay or totally prevent the commercialization of our products in the EU should we wish to expand our sales there.

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.

***Government policies and regulations, particularly those affecting the agricultural sector and related industries, could adversely affect our operations and profitability.***

Agricultural production and trade flows are subject to government policies and regulations. Governmental policies and approvals of technologies affecting the agricultural industry, such as taxes, tariffs, duties, subsidies, incentives and import and export restrictions on agricultural commodities and commodity products can influence the planting of certain crops, the location and size of crop production, and the volume and types of imports and exports. Future government policies in the United States or in other countries may discourage food manufacturers or farmers from using our products or encourage the use of products more advantageous to our competitors, which would put us at a commercial disadvantage and could negatively impact our future revenues and results of operations.

***We may use hazardous chemicals and biological materials in our business and are subject to numerous environmental, health and safety laws and regulations. Compliance with such laws and regulations and any claims relating to improper handling, storage or disposal of these materials could be time consuming and costly.***

We are subject to numerous federal, state, local and foreign environmental, health and safety laws and regulations, including those governing laboratory procedures, the handling, use, storage, treatment, manufacture and disposal of hazardous materials and wastes, discharge of pollutants into the environment and human health and safety matters. Our R&D processes may involve the controlled use of hazardous materials, including chemicals and biological materials. We cannot eliminate the risk of contamination or discharge and any resultant injury from these materials. We may be sued for any injury or contamination that results from our use or the use by third parties of these materials, or may otherwise be required to remediate such contamination, and our liability may exceed any insurance coverage and our total assets. Compliance with environmental, health and safety laws and regulations may be expensive and may impair our R&D efforts. If we fail to comply with these requirements, we could incur substantial costs and liabilities, including civil or criminal fines and penalties, clean-up costs or capital expenditures for control equipment or operational changes necessary to achieve and maintain compliance. In addition, we cannot predict the impact on our business of new or amended environmental, health and safety laws or regulations or any changes in the way existing and future laws and regulations are interpreted and enforced. These current or future laws and regulations may impair our research, development or production efforts.

***Adverse outcomes in future legal proceedings could subject us to substantial damages, adversely affect our results of operations, harm our reputation and result in governmental actions.***

We may become party to legal proceedings, including matters involving personnel and employment issues, personal injury, product liability, environmental matters, intellectual property disputes and other proceedings. We may be held liable if our traits do not perform as anticipated by our customers, or if any product that we develop or any product that uses our technologies or incorporates any of our traits is found unsuitable during marketing, sale or consumption. Courts could levy substantial damages against us in connection with claims arising from the use of our products.

The detection of unintended traits in our seeds could result in governmental actions such as mandated crop destruction, product recalls or environmental cleanup or monitoring. Concerns about seed quality could also lead to additional regulations being imposed on our business, such as regulations related to testing procedures, mandatory governmental reviews of biotechnology advances, or the integrity of the food supply chain from the farm to the finished product.

Depending on their nature, certain future legal 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 damage our market reputation and have an adverse effect on our results of operations.

**Risks Related to Intellectual Property**

***We license a significant portion of our intellectual property from Cellectis, our majority stockholder, and principally rely upon it to prosecute and defend such intellectual property.***

Our business relies heavily on the intellectual property we license from Cellectis. Our license from Cellectis is exclusive in the field of researching, developing and commercializing agricultural and food products, including traits, seeds, and feed and food ingredients (excluding any application in connection with animals and animal cells), except that such license is non-exclusive in such field for any activities relating to researching, developing or commercializing certain modified or mutated I-CreI homing endonucleases. In addition, Cellectis has previously granted other third parties non-exclusive rights to use the same intellectual property for research purposes and therefore our exclusive license is subject to such previously granted rights. Pursuant to our license agreement with Cellectis, we are required to pay Cellectis certain royalties and other consideration based upon our commercialization and use of the licensed intellectual property. If we do not comply with our obligations under the license agreement, including the foregoing payment obligations, we may be subject to damages, which may be significant, and in some cases Cellectis may have the right to terminate the license agreement. Any termination of our license agreement with Cellectis would have a material adverse effect on our business and results of operations.

Under our license agreement with Cellectis, and as between the parties, Cellectis has the first right to control the prosecution, maintenance, defense and enforcement of the licensed intellectual property and we have the right to step in and assume such control with respect to the patents owned by Cellectis and exclusively licensed to us under the agreement if Cellectis elects to not prosecute, maintain, defend or enforce such patents. In addition, in certain circumstances, if Cellectis elects to abandon any patents owned by Cellectis and exclusively licensed to us under the agreement, we have the right to assume ownership of such patents. However, there can be no assurance that Cellectis will prosecute, maintain, defend and enforce such intellectual property, either in the best interests of our business or at all. Moreover, any enforcement of the licensed intellectual property could subject it to challenge by third parties and if any such challenge is successful, such intellectual property could be narrowed

in scope or held to be invalid or unenforceable, which would materially impair any competitive advantage afforded to us by such intellectual property.

In addition, some of the intellectual property that is licensed to us by Cellectis consists of a sublicense of intellectual property originally licensed to Cellectis by the Regents of the University of Minnesota, which we refer to as the University of Minnesota, to use such intellectual property in our exclusive agricultural field of use. Therefore, as to such sublicensed intellectual property, our license from Cellectis is subject to the terms and conditions of the license agreement between the University of Minnesota and Cellectis, and to the extent our activities under such sublicense violate any terms and conditions of the license agreement between Cellectis and the University of Minnesota, we will be responsible for any damages that Cellectis may incur. In addition, under the license agreement between Cellectis and the University of Minnesota, the University of Minnesota has the first right to control the prosecution and maintenance of the licensed intellectual property. There can be no assurance that the University of Minnesota will prosecute and maintain such intellectual property in the best interests of our business or at all, and, if the University of Minnesota fails to properly prosecute and maintain such intellectual property, we could lose our rights to such intellectual property, which would materially impair any competitive advantage afforded to us by such intellectual property. For more information regarding our license agreement with Cellectis or the license agreement between Cellectis and the University of Minnesota, please see "Business—Intellectual Property."

***Our ability to compete may decline if we do not, or Cellectis does not, adequately protect our proprietary rights.***

Our commercial success depends, in part, on obtaining and maintaining proprietary rights to our and our licensors' intellectual property estate, including with respect to our product candidates, as well as successfully defending these rights against third-party challenges. Cellectis will only be able to protect our product candidates from unauthorized use by third parties to the extent that valid and enforceable patents, or effectively protected trade secrets, cover them. Our ability to obtain patent protection for our product candidates is uncertain due to a number of factors, including:

- we or our licensors may not have been the first to invent the technology covered by our or their pending patent applications or issued patents;
- we cannot be certain that we or our licensors were the first to file patent applications covering our product candidates, including their compositions or methods of use, as patent applications in the United States and most other countries are confidential for a period of time after filing;
- others may independently develop identical, similar or alternative products or compositions or methods of use thereof;
- the disclosures in our or our licensors' patent applications may not be sufficient to meet the statutory requirements for patentability;
- any or all of our or our licensors' pending patent applications may not result in issued patents;
- we or our licensors may not seek or obtain patent protection in countries or jurisdictions that may eventually provide us a significant business opportunity;
- any patents issued to us or our licensors may not provide a basis for commercially viable products, may not provide any competitive advantages, or may be successfully challenged by third parties, which may result in our or our licensors' patent claims being narrowed, invalidated or held unenforceable;
- our compositions and methods may not be patentable;
- others may design around our or our licensors' patent claims to produce competitive products that fall outside of the scope of our or our licensors' patents; and
- others may identify prior art or other bases upon which to challenge and ultimately invalidate our or our licensors' patents or otherwise render them unenforceable.

Even if we own, obtain or in-license patents covering our product candidates or compositions, we may still be barred from making, using and selling our product candidates or technologies because of the patent rights or

other intellectual property rights of others. Others may have filed, and in the future may file, patent applications covering compositions, products or methods that are similar or identical to ours, which could materially affect our ability to successfully develop and commercialize our product candidates. In addition, because patent applications can take many years to issue, there may be currently pending applications unknown to us that may later result in issued patents that our product candidates or compositions may infringe. These patent applications may have priority over patent applications filed by us or our licensors.

Obtaining and maintaining a patent portfolio entails significant expense of resources. Part of such expense includes periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications due over the course of several stages of prosecuting patent applications, and over the lifetime of maintaining and enforcing issued patents. We or our licensors may or may not choose to pursue or maintain protection for particular intellectual property in our or our licensors' portfolio. If we or our licensors choose to forgo patent protection or to allow a patent application or patent to lapse purposefully or inadvertently, our competitive position could suffer. In some cases, the prosecution and maintenance of our licensed patents is controlled by the applicable licensor. If such licensor fails to properly prosecute and maintain such patents, we could lose our rights to them which could materially impair any competitive advantage afforded by such patents. Furthermore, we and our licensors employ reputable law firms and other professionals to help comply with the various procedural, documentary, fee payment and other similar provisions we and they are subject to and, in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. There are situations, however, in which failure to make certain payments or noncompliance with certain requirements in the patent prosecution and maintenance process can result in abandonment or lapse of a patent or patent application, resulting in a partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to enter the market, which would have a material adverse effect on our business.

Legal action that may be required to enforce our patent rights can be expensive and may involve the diversion of significant management time. In addition, these legal actions could be unsuccessful and could also result in the invalidation of our or our licensors' patents or a finding that they are unenforceable. We or our licensors may or may not choose to pursue litigation or other actions against those that have infringed on our or their patents, or have used them without authorization, due to the associated expense and time commitment of monitoring these activities. In some cases, the enforcement and defense of patents we in-license is controlled by the applicable licensor. If such licensor fails to actively enforce and defend such patents, any competitive advantage afforded by such patents could be materially impaired. In addition, some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we or our licensors can because of their greater financial resources and more mature and developed intellectual property portfolios. Accordingly, despite our efforts, we may not be able to prevent third parties from infringing upon or misappropriating or successfully challenging our intellectual property rights. If we fail to protect or to enforce our intellectual property rights successfully, our competitive position could suffer, which could harm our results of operations.

In addition to patent protection, because we operate in the highly technical field of biosciences, we rely in part on trade secret protection in order to protect our proprietary technology and processes. However, trade secrets are difficult to protect. Monitoring unauthorized uses and disclosures is difficult, and we do not know whether the steps we have taken to protect our proprietary technologies will be effective. We cannot guarantee that our trade secrets and other proprietary and confidential information will not be disclosed or that competitors will not otherwise gain access to our trade secrets. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. We enter into confidentiality and intellectual property assignment agreements with our employees, consultants, outside scientific collaborators, sponsored researchers, and other advisors. These agreements generally require that the other party keep confidential and not disclose to third parties all confidential information developed by the party or made known to the party by us during the course of the party's relationship with us. These agreements also generally provide that inventions conceived by the party in

the course of rendering services to us will be our exclusive property. However, these agreements may be breached or held unenforceable and may not effectively assign intellectual property rights to us.

In addition to contractual measures, we try to protect the confidential nature of our proprietary information using physical and technological security measures. Such measures may not provide adequate protection for our proprietary information. For example, our security measures may not prevent an employee or consultant with authorized access from misappropriating our trade secrets and providing them to a competitor, and the recourse we have available against such misconduct may not provide an adequate remedy to protect our interests fully. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret can be difficult, expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the United States may be less willing to protect trade secrets. Furthermore, our proprietary information may be independently developed by others in a manner that could prevent legal recourse by us. If any of our confidential or proprietary information, including our trade secrets, were to be disclosed or misappropriated, or if any such information was independently developed by a competitor, our competitive position could be harmed and our business could be materially and adversely affected.

***Patents and patent applications involve highly complex legal and factual questions, which, if determined adversely to us, could negatively impact our competitive position.***

The patent positions of biotechnology companies and other actors in our fields of business can be highly uncertain and involve complex scientific, legal and factual analyses. The interpretation and breadth of claims allowed in some patents covering biological compositions may be uncertain and difficult to determine, and are often affected materially by the facts and circumstances that pertain to the patented compositions and the related patent claims. The standards of the United States Patent and Trademark Office, or USPTO, and foreign patent offices are sometimes uncertain and could change in the future. Consequently, the issuance and scope of patents cannot be predicted with certainty. Patents, if issued, may be challenged, invalidated, narrowed or circumvented. U.S. patents and patent applications may also be subject to interference proceedings, and U.S. patents may be subject to reexamination proceedings, post-grant review, *inter partes* review, or other administrative proceedings in the USPTO. Foreign patents as well may be subject to opposition or comparable proceedings in corresponding foreign patent offices. Challenges to our or our licensors' patents and patent applications, if successful, may result in the denial of our or our licensors' patent applications or the loss or reduction in their scope. In addition, such interference, reexamination, post-grant review, *inter partes* review, opposition proceedings and other administrative proceedings may be costly and involve the diversion of significant management time. Accordingly, rights under any of our or our licensors' patents may not provide us with sufficient protection against competitive products or processes and any loss, denial or reduction in scope of any of such patents and patent applications may have a material adverse effect on our business.

Even if not challenged, our or our licensors' patents and patent applications may not adequately protect our product candidates or technology or prevent others from designing their products or technology to avoid being covered by our or our licensors' patent claims. If the breadth or strength of protection provided by the patents we own or license with respect to our product candidates is threatened, it could dissuade companies from partnering with us to develop, and could threaten our ability to successfully commercialize, our product candidates. Furthermore, for U.S. patent applications in which claims are entitled to a priority date before March 16, 2013, an interference proceeding can be provoked by a third party or instituted by the USPTO in order to determine who was the first to invent any of the subject matter covered by such patent claims.

In addition, changes in, or different interpretations of, patent laws in the United States and other countries may permit others to use our discoveries or to develop and commercialize our technology and products without providing any notice or compensation to us, or may limit the scope of patent protection that we or our licensors are able to obtain. The laws of some countries do not protect intellectual property rights to the same extent as U.S. laws and those countries may lack adequate rules and procedures for defending our intellectual property rights.

If we or our licensors fail to obtain and maintain patent protection and trade secret protection of our product candidates and technology, we could lose our competitive advantage and competition we face would increase, reducing any potential revenues and have a material adverse effect on our business.

***The lives of our patents may not be sufficient to effectively protect our products and business.***

Patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after its first effective filing date. Although various extensions may be available, the life of a patent, and the protection it affords, is limited. Our or our licensors' issued patents will expire on dates ranging from 2020 to 2033, subject to any patent extensions that may be available for such patents. If patents are issued on our or our licensors' pending patent applications, the resulting patents are projected to expire on dates ranging from 2023 to 2037. If we or our licensors do not have sufficient patent life to protect our products, our business and results of operations will be adversely affected.

***Developments in patent law could have a negative impact on our business.***

The United States Supreme Court, United States federal courts, the United States Congress, the USPTO and similar foreign authorities may change the standards of patentability and any such changes could have a negative impact on our business.

The Leahy-Smith America Invents Act, or the America Invents Act, which was signed into law in 2011, includes a number of significant changes to U.S. patent law. These changes include a transition from a "first-to-invent" system to a "first-to-file" system, changes to the way issued patents are challenged, and changes to the way patent applications are disputed during the examination process. As a result of these changes, the patent law in the United States may favor larger and more established companies that have greater resources to devote to patent application filing and prosecution. The USPTO has developed new and untested regulations and procedures to govern the full implementation of the America Invents Act, and many of the substantive changes to patent law associated with the America Invents Act, and, in particular, the first-to-file provisions became effective on March 16, 2013. Substantive changes to patent law associated with the America Invents Act may affect our ability to obtain patents, and if obtained, to enforce or defend them. Accordingly, it is not clear what, if any, impact the America Invents Act will have on the cost of prosecuting our or our licensors' patent applications and the ability for us and our licensors to obtain patents and enforce or defend any patents that may issue from such patent applications, all of which could have a material adverse effect on our business.

In addition, recent Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. This combination of events has created uncertainty with respect to the validity and enforceability of patents, once obtained. Depending on future actions by the Supreme Court, the United States Congress, the federal courts, the USPTO and similar foreign authorities, the laws and regulations governing patents could change in unpredictable ways that could have a material adverse effect on our existing patent portfolio and our ability to protect and enforce our intellectual property in the future.

***We will not seek to protect our intellectual property rights in all jurisdictions throughout the world and we may not be able to adequately enforce our intellectual property rights even in the jurisdictions where we seek protection.***

Filing, prosecuting and defending patents on our product candidates in all countries and jurisdictions throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States could be less extensive than those in the United States, assuming that rights are obtained 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. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions.

Competitors may use our technologies in jurisdictions where we or our licensors do not pursue and obtain patent protection to develop their own products and further, may export otherwise infringing products to territories where we or our licensors have patent protection, but where the ability to enforce our or our licensors' patent rights is not as strong as in the United States. These products may compete with our products and our intellectual property rights and such rights may not be effective or sufficient to prevent such competition.

The laws of some foreign countries do not protect intellectual property rights to the same extent as the laws of the United States. Patent protection must be sought on a country-by-country basis, which is an expensive and time-consuming process with uncertain outcomes. Accordingly, we and our licensors may choose not to seek patent protection in certain countries, and we will not have the benefit of patent protection in such countries. In addition, the legal systems of some countries, particularly developing countries, do not favor the enforcement of patents and other intellectual property protection, especially those relating to biotechnologies. The requirements for patentability differ from country to country, and the laws of some foreign countries do not protect intellectual property rights, including trade secrets, to the same extent as federal and state laws of the United States. Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. These realities may make it difficult for us to stop the infringement, misappropriation or other violation of our intellectual property rights. Many foreign countries, including the EU countries, have compulsory licensing laws under which a patent owner must grant licenses to third parties. In addition, many countries limit the enforceability of patents against third parties, including government agencies or government contractors. In these countries, patents may provide limited or no benefit. In those countries, we and our licensors may have limited remedies if patents are infringed or if we or our licensors are compelled to grant a license to a third party, which could materially diminish the value of those patents. This could limit our potential revenue opportunities. Accordingly, our and our licensors' efforts to enforce intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we own or license. Similarly, if our trade secrets are disclosed in a foreign jurisdiction, competitors worldwide could have access to our proprietary information and we may be without satisfactory recourse. Such disclosure could have a material adverse effect on our business. Moreover, our ability to protect and enforce our intellectual property rights may be adversely affected by unforeseen changes in foreign intellectual property laws.

Furthermore, proceedings to enforce our licensors' and our patent rights and other intellectual property rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our or our licensors' patents at risk of being invalidated or interpreted narrowly, could put our or our licensors' patent applications at risk of not issuing and could provoke third parties to assert claims against us or our licensors. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded to us, if any, may not be commercially meaningful, while the damages and other remedies we may be ordered to pay such third parties may be significant. Accordingly, our licensors' and 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.

***Third parties may assert rights to inventions we develop or otherwise regard as our own.***

Third parties may in the future make claims challenging the inventorship or ownership of our or our licensors' intellectual property. We have written agreements with R&D partners that provide for the ownership of intellectual property arising from our strategic alliances. These agreements provide that we must negotiate certain commercial rights with such partners with respect to joint inventions or inventions made by our partners that arise from the results of the strategic alliance. In some instances, there may not be adequate written provisions to address clearly the allocation of intellectual property rights that may arise from the respective alliance. If we cannot successfully negotiate sufficient ownership and commercial rights to the inventions that result from our use of a third-party partner's materials when required, or if disputes otherwise arise with respect to the intellectual property developed through the use of a partner's samples, we may be limited in our ability to capitalize on the full market potential of these inventions. In addition, we may face claims by third parties that

our agreements with employees, contractors, or consultants obligating them to assign intellectual property to us are ineffective, or are in conflict with prior or competing contractual obligations of assignment, which could result in ownership disputes regarding intellectual property we have developed or will develop and could interfere with our ability to capture the full commercial value of such inventions. Litigation may be necessary to resolve an ownership dispute, and if we are not successful, we may be precluded from using certain intellectual property and associated products and technology, or may lose our rights in that intellectual property. Either outcome could have a material adverse effect on our business.

In addition, the research resulting in certain of our in-licensed patent rights and technology was funded in part by the United States government. As a result, the United States government has certain rights to such patent rights and technology, which include march-in rights. When new technologies are developed with government funding, the government generally obtains certain rights in any resulting patents, including a non-exclusive license authorizing the government to use the invention or to have others use the invention on its behalf. The government can exercise its march-in rights if it determines that action is necessary because we fail to achieve practical application of the government-funded technology, or because action is necessary to alleviate health or safety needs, to meet requirements of federal regulations, or to give preference to the United States industry. Any exercise by the government of any of the foregoing rights could have a material adverse effect on our business.

***We may not identify relevant third-party patents or may incorrectly interpret the relevance, scope or expiration of a third-party patent which might adversely affect our ability to develop and market our products.***

We cannot guarantee that any of our patent searches or analyses, including but not limited to the identification of relevant patents, the scope of patent claims or the expiration of relevant patents, are complete or thorough, nor can we be certain that we have identified each and every third-party patent and pending application in the United States and abroad that is relevant to or necessary for the commercialization of our product candidates in any jurisdiction.

The scope of a patent claim is determined by an interpretation of the law, the written disclosure in a patent and the patent's prosecution history. Our interpretation of the relevance or the scope of a patent or a pending application may be incorrect, which may negatively impact our ability to market our products. We may incorrectly determine that our products are not covered by a third-party patent or may incorrectly predict whether a third party's pending application will issue with claims of relevant scope. Our determination of the expiration date of any patent in the United States or abroad that we consider relevant may be incorrect, which may negatively impact our ability to develop and market our product candidates. Our failure to identify and correctly interpret relevant patents may negatively impact our ability to develop and market our products.

***Third parties may assert that our employees or consultants have wrongfully used or disclosed confidential information or misappropriated trade secrets.***

We currently employ, and in the future may employ, individuals who were previously employed at universities or other biotechnology companies, including our competitors or potential competitors. Although we try to ensure that our employees and consultants do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed intellectual property, including trade secrets or other proprietary information, of a former employer or other third parties. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

***Any infringement, misappropriation or other violation by us of intellectual property rights of others may prevent or delay our product development efforts and may prevent or increase the costs of our successfully commercializing our product candidates, if approved.***

Our success will depend in part on our ability to operate without infringing, misappropriating or otherwise violating the intellectual property and proprietary rights of third parties. We cannot assure that our business operations, products, product candidates and methods and the business operations, products, product candidates and methods of our partners do not or will not infringe, misappropriate or otherwise violate the patents or other intellectual property rights of third parties.

The biotechnology industry is characterized by extensive litigation regarding patents and other intellectual property rights. Other parties may allege that our products, product candidates or the use of our technologies infringe, misappropriate or otherwise violate patent claims or other intellectual property rights held by them or that we are employing their proprietary technology without authorization. Patent and other types of intellectual property litigation can involve complex factual and legal questions, and their outcome is uncertain. Any claim relating to intellectual property infringement that is successfully asserted against us may require us to pay substantial damages, including treble damages and attorneys' fees if we or our partners are found to be willfully infringing another party's patents, for past use of the asserted intellectual property and royalties and other consideration going forward if we are forced to take a license. Such a license may not be available on commercially reasonable terms, or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same intellectual property rights or technologies licensed to us. In addition, if any such claim were successfully asserted against us and we could not obtain a license, we or our partners may be forced to stop or delay developing, manufacturing, selling or otherwise commercializing our products, product candidates or other infringing technology, or those we develop with our R&D partners.

Even if we are successful in these proceedings, we may incur substantial costs and divert management time and attention pursuing these proceedings, which could have a material adverse effect on us. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. If we are unable to avoid infringing the patent rights of others, we may be required to seek a license, defend an infringement action or challenge the validity of the patents in court, or redesign our products. Patent litigation is costly and time consuming. We may not have sufficient resources to bring these actions to a successful conclusion. In addition, intellectual property litigation or claims could force us to do one or more of the following:

- cease developing, selling or otherwise commercializing our product candidates;
- pay substantial damages for past use of the asserted intellectual property;
- obtain a license from the holder of the asserted intellectual property, which license may not be available on reasonable terms, if at all; and
- in the case of trademark claims, redesign, or rename trademarks we may own, to avoid infringing the intellectual property rights of third parties, which may not be possible and, even if possible, could be costly and time-consuming.

Any of these risks coming to fruition could have a material adverse effect on our business, results of operations, financial condition and prospects.

***We may be unsuccessful in licensing or acquiring intellectual property that may be required to develop and commercialize our product candidates from third parties.***

Our programs may involve additional product candidates that may require the use of intellectual property or proprietary rights held by third parties; the growth of our business may depend in part on our ability to acquire, in-license or use these intellectual property and proprietary rights. However, we may be unable to acquire or in-license any third-party intellectual property or proprietary rights that may be key to development. Even if we are able to acquire or in-license such rights, we may be unable to do so on commercially reasonable terms. The licensing and acquisition of third-party intellectual property and proprietary rights is a competitive area, and a number of more established companies are also pursuing strategies to license or acquire third-party intellectual property and proprietary rights that we may consider attractive or necessary. These established companies may have a competitive advantage over us due to their size, capital resources and agricultural development and commercialization capabilities.

We sometimes partner with academic institutions to accelerate our research or development under written agreements with these institutions. Typically, these institutions provide us with an option to negotiate a license to any of the institution's rights in technology resulting from the strategic alliance. Regardless of such option, we may be unable to negotiate a license within the specified time frame or under terms that are acceptable to us, and the institution may license such intellectual property rights to third parties, potentially blocking our ability to pursue our development and commercialization plans.

Further, our consulting agreement with Dr. Voytas generally obligates Dr. Voytas to assign to us any intellectual property solely or jointly conceived, developed or reduced to practice by him in the course of the performance of his services to us. However, we do not have any rights, including any assignment or right of first refusal rights, to intellectual property conceived, developed or reduced to practice by Dr. Voytas outside the course of the performance of his services to us, including in connection with his employment at the University of Minnesota.

In addition, companies that perceive us to be a competitor may be unwilling to assign or license intellectual property and proprietary rights to us. We also may be unable to license or acquire third-party intellectual property and proprietary rights on terms that would allow us to make an appropriate return on our investment or at all. If we are unable to successfully acquire or in-license rights to required third-party intellectual property and proprietary rights or maintain the existing intellectual property and proprietary rights we have, we may have to cease development of the relevant program, product or product candidate, which could have a material adverse effect on our business.

***If we fail to comply with our obligations in the agreements under which we license intellectual property rights from third parties or otherwise experience disruptions to our business relationships with our licensors, we could lose license rights that are important to our business.***

We are a party to a number of intellectual property license agreements that are important to our business and expect to enter into additional license agreements in the future. Our existing license agreements impose, and we expect that future license agreements will impose, various diligence, royalty and other obligations on us. If we fail to comply with our obligations under these agreements, or we are subject to a bankruptcy, our licensors may have the right to terminate the license, in which event we would not be able to market products or product candidates covered by the license.

In addition, disputes may arise regarding the payment of the royalties or other consideration due to licensors in connection with our exploitation of the rights we license from them. Licensors may contest the basis of payments we retained and claim that we are obligated to make payments under a broader basis. In addition to the costs of any litigation we may face as a result, any legal action against us could increase our payment obligations under the respective agreement and require us to pay interest and potentially damages to such licensors.

In some cases, patent prosecution of our licensed technology is controlled solely by the licensor. If such licensor fails to obtain and maintain patent or other protection for the proprietary intellectual property we license from such licensor, we could lose our rights to such intellectual property or the exclusivity of such rights, and our competitors could market competing products using such intellectual property. In addition, these patents and

applications may not be prosecuted and enforced in a manner consistent with the best interests of our business. In that event, we may be required to expend significant time and resources to develop or license replacement technology. If we are unable to do so, we may be unable to develop or commercialize the affected products and product candidates, which could harm our business significantly. In other cases, we control the prosecution of patents resulting from licensed technology. In the event we breach any of our obligations related to such prosecution, we may incur significant liability to our licensing partners. We may also require the cooperation of our licensors to enforce any licensed patent rights, and such cooperation may not be provided. Moreover, we have obligations under these license agreements, and any failure to satisfy those obligations could give our licensor the right to terminate the agreement. Termination of a necessary license agreement could have a material adverse impact on our business.

Licensing of intellectual property is of critical importance to our business and involves complex legal, business and scientific issues and is complicated by the rapid pace of scientific discovery in our industry. Disputes may arise regarding intellectual property subject to a licensing agreement (including the intellectual property licensed to us by Cellectis), including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- the basis of royalties and other consideration due to our licensors;
- the extent to which our products, product candidates, technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- the sublicensing of patent and other rights under our development relationships;
- our diligence obligations under the license agreement and what activities satisfy those diligence obligations;
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners; and
- the priority of invention of patented technology.

If disputes over intellectual property that we have licensed from third parties prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates, which could have a material adverse effect on our business.

***Our results of operations will be affected by the level of royalty payments that we are required to pay to third parties.***

We are party to agreements that require us to remit royalty payments and other payments related to our owned or licensed intellectual property.

Under our in-license agreements, we may pay up-front fees and milestone payments and be subject to future royalties. We cannot precisely predict the amount, if any, of royalties we will owe in the future, and if our calculations of royalty payments are incorrect, we may owe additional royalties, which could negatively affect our results of operations. As our product sales increase, we may, from time to time, disagree with our third-party collaborators as to the appropriate royalties owed and the resolution of such disputes may be costly and may consume management's time. Furthermore, we may enter into additional license agreements in the future, which may also include royalty, milestone and other payments.

***If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.***

Our trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names or may be forced to stop using these names and trademarks, which we need for name recognition by potential partners or food manufacturers or farmers in our markets of interest. If we are unable to establish name recognition based on our trademarks and trade names, we may not be able to compete effectively and our business may be adversely affected.

**Risks Related to Our Organization and Operation**

***We will need to develop and expand our company, and we may encounter difficulties in managing this development and expansion, which could disrupt our operations.***

As of December 31, 2018, we had 50 employees. We expect to increase our number of employees and the scope and location of our operations. To manage our anticipated development and expansion, including the development and the commercialization of our product candidates, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Members of our management team may need to divert a disproportionate amount of their attention away from their day-to-day activities and devote a substantial amount of time to managing these development activities. Due to our limited resources, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. This may result in weaknesses in our infrastructure, give rise to operational mistakes, loss of business opportunities, loss of employees and reduced productivity among remaining employees. The physical expansion of our operations may lead to significant costs and may divert financial resources from other projects, such as the development of our product candidates. If our management is unable to effectively manage our expected development and expansion, our expenses may increase more than expected, our ability to generate or increase our revenue could be reduced and we may not be able to implement our business strategy. Our future financial performance and our ability to commercialize our product candidates, if approved, and compete effectively will depend, in part, on our ability to effectively manage the future development and expansion of our company.

***We depend on key management personnel and attracting and retaining other qualified personnel, and our business could be harmed if we lose key management personnel or cannot attract and retain other qualified personnel.***

Our success depends to a significant degree upon the technical skills and continued service of certain members of our management team: James A. Blome, our Chief Executive Officer, and Daniel Voytas, Ph.D., our Chief Science Officer. Dr. Voytas works for us as a consultant pursuant to a consulting agreement under which he is required to work 10 days per month with us. The loss of the services of one or both of these key executive officers could have a material adverse effect on us. We do not maintain key man insurance policies on the lives of any of our employees. Our success also will depend upon our ability to attract and retain additional qualified management, regulatory, technical, and sales and marketing executives and personnel. The failure to attract, integrate, motivate, and retain additional skilled and qualified personnel could have a material adverse effect on our business.

We compete for such personnel against numerous companies, including larger, more established companies with significantly greater financial resources than we possess. In addition, failure to succeed in our product candidates' development may make it more challenging to recruit and retain qualified personnel. There can be no assurance that we will be successful in attracting or retaining such personnel and the failure to do so could have a material adverse effect on our business, financial condition, and results of operations.

***We may not be able to fully enforce covenants not to compete with our key management personnel, and therefore we may be unable to prevent our competitors from benefiting from the expertise of such employees.***

Our offer letters with key management personnel, which include executive officers, and our consulting agreement with Dr. Voytas, contain non-compete provisions. These provisions prohibit our key management personnel, if they cease working for us, from competing directly with us or working for our competitors for a period of time. Under applicable laws, we may be unable to enforce these provisions. If we cannot enforce the non-compete provisions with our key management personnel, we may be unable to prevent our competitors from benefiting from the expertise of such management personnel. Even if these provisions are enforceable, they may not adequately protect our interests. The defection of one or more of our management personnel to a competitor

could materially adversely affect our business, results of operations and ability to capitalize on our proprietary information.

***We must maintain effective internal control over financial reporting, and if we are unable to do so, the accuracy and timeliness of our financial reporting may be adversely affected, which could have a material adverse effect on our business, investor confidence and market price.***

We must maintain effective internal control over financial reporting in order to accurately and timely report our results of operations and financial condition. As a public company, the Sarbanes-Oxley Act requires, among other things, that we assess the effectiveness of our controls over financial reporting at the end of each fiscal year and the effectiveness of our disclosure controls and procedures quarterly.

The rules governing the standards that must be met for our management to assess our internal control over financial reporting pursuant to Section 404 of the Sarbanes-Oxley Act are complex and require significant documentation, testing and possible remediation. These stringent standards require that our audit and finance committee be advised and regularly updated on management's assessment of internal control over financial reporting. In addition, our independent registered public accounting firm will be required to attest to the effectiveness of our internal controls over financial reporting beginning with our annual report following the date on which we are no longer an "emerging growth company." If we fail to staff our accounting and finance function adequately or maintain internal control over financial reporting adequate to meet the requirements of the Sarbanes-Oxley Act, our business and reputation may be harmed.

***Our internal computer systems, or those of our third-party contractors or consultants, may fail or suffer security breaches, which could result in a material disruption of our product development programs.***

Despite the implementation of security measures, our internal computer systems and those of our third-party contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While we do not believe that we have experienced any such system failure, accident, or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our programs. For example, the loss of field trial data for our product candidates could result in delays in our regulatory clearance and significantly increase our costs to recover or reproduce the data. Additionally, there have been reported cases in the industry where product candidates have been stolen from the field during field trials. To the extent that any disruption or security breach results in a loss of or damage to our data or applications or other data or applications relating to our technology or product candidates, or inappropriate disclosure of confidential or proprietary information, we could incur liabilities and the further development of our product candidates could be delayed.

***Our business and operations would suffer in the event of computer system failures, cyber-attacks or a deficiency in our cyber-security.***

Despite the implementation of security measures, our internal computer systems, and those of third parties on which we rely, are vulnerable to damage from computer viruses, malware, natural disasters, terrorism, war, telecommunication and electrical failures, cyber-attacks or cyber-intrusions over the Internet, attachments to emails, persons inside our organization, or persons with access to systems inside our organization. The risk of a security breach or disruption, particularly through cyber-attacks or cyber-intrusion, including by computer hackers, foreign governments, and cyber terrorists, has generally increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. If such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our product development programs. For example, the loss of field trial data from completed or ongoing or planned field trials could result in delays in our regulatory clearance and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach was to result in a loss of or damage to our data or

applications, or inappropriate disclosure of confidential or proprietary information, we could incur material legal claims and liability, damage to our reputation, and the further development of our product candidates could be delayed.

***We may acquire businesses or products, or form strategic alliances, in the future, and we may not realize the benefits of such acquisitions.***

We plan to selectively partner, in-license or acquired key enabling technologies and businesses across our value chain that we believe will keep us on the cutting edge of our industry. We may not be able to identify appropriate targets or make acquisitions under satisfactory conditions, in particular, satisfactory price conditions. In addition, we may be unable to obtain the financing for these acquisitions under favorable conditions, and could be led to finance these acquisitions using cash that could be allocated to other purposes in the context of existing operations. If we acquire businesses with promising markets or technologies, we may not be able to realize the benefit of acquiring such businesses if we are unable to successfully integrate them with our existing operations and company culture. We may encounter numerous difficulties in developing, manufacturing and marketing any new products resulting from a strategic alliance or acquisition that delay or prevent us from realizing their expected benefits or enhancing our business. We cannot assure you that, following any such acquisition, we will achieve the expected synergies to justify the transaction, which could have a material adverse effect on our business, financial conditions, earnings and prospects.

**Risks Related to Our Relationship with Cellectis**

***Cellectis controls the direction of our business, and the concentrated ownership of our common stock and certain contractual rights Cellectis has will prevent you and other stockholders from influencing significant decisions.***

As of December 31, 2018, Cellectis owned approximately 69.5% of our outstanding shares of common stock. Pursuant to our stockholders' agreement with Cellectis, Cellectis will have certain contractual rights for so long as it beneficially owns at least 50% of the then outstanding shares of our common stock, including:

- to approve any modification to our or any future subsidiary's share capital (e.g., share capital increase or decrease), the creation of any subsidiary, any grant of stock-based compensation, any distributions or public or private offering, merger, spin-off, liquidation, winding up or carve-out transactions;
- to approve the annual business plan and annual budget and any modification thereof;
- to approve any external growth transactions exceeding $500,000 and not included in the approved annual business plan and annual budget;
- to approve any investment and disposition decisions exceeding $500,000 and not included in the approved annual business plan and annual budget (it being understood that this clause excludes the purchase and sale of inventory as a part of the normal course of business);
- to approve any related-party agreement and any agreement or transaction between the executives or shareholders of Calyxt and Calyxt or any of its subsidiaries;
- to approve any decision pertaining to the recruitment, dismissal/removal, or increase of the compensation of executives and corporate officers;
- to approve any material decision relating to a material litigation;
- to approve any decision relating to the opening of a social or restructuring plan or pre-insolvency proceedings;
- to approve any buyback by us of our own shares;
- to approve any new borrowings or debts exceeding $500,000 and early repayment of loans, if any (it being understood that Cellectis will approve the entering into of contracts for revolving loans and other short-term loans and the repayment of such for financing general operating activities, such as revolving loans for inventory or factoring of receivables);
- to approve grants of any pledges on our securities;

- to approve the development of any new activities and businesses not described in the annual business plan and annual budget;
- to approve entry into any material agreement or partnership; and
- to approve any offshore and relocation activities.

In addition, Cellectis will have the following rights for so long as it beneficially owns at least 15% of the then outstanding shares of our common stock, including:

- to nominate the greater of three members of our Board of Directors or a majority of the directors;
- to designate the Chairman of our Board of Directors and one member to each of the audit committee of the Board of Directors, the compensation committee of the Board of Directors and the nominating and corporation governance committee of the Board of Directors;
- to approve any amendments to our amended and restated certificate of incorporation or our amended and restated by-laws that would change the name of our company, its jurisdiction of incorporation, the location of its principal executive offices, the purpose or purposes for which our company is incorporated or the Cellectis approval items set forth in the stockholders' agreement;
- to approve the payment of any regular or special dividends;
- to approve the commencement of any voluntary proceeding for the dissolution, winding up or bankruptcy of Calyxt or a material subsidiary;
- to approve any public or private offering, merger, amalgamation or consolidation of us or the spinoff of a business of ours or any sale, conveyance, transfer or other disposition of our assets; and
- to approve any appointment to, or removal from, our Board of Directors.

As a result, Cellectis controls the direction of our business, and the concentrated ownership of our common stock and the contractual rights described above will prevent stockholders from influencing significant decisions.

***If Cellectis sells a controlling interest in our company to a third party in a private transaction, stockholders may not realize any change-of-control premium on shares of our common stock and we may become subject to the control of a presently unknown third party.***

Cellectis has the ability, should it choose to do so, to sell some or all of its shares of our common stock in a privately negotiated transaction, which, if sufficient in size, could result in a change of control of our company.

The ability of Cellectis to privately sell its shares of our common stock, with no requirement for a concurrent offer to be made to acquire all of the shares of our common stock could prevent stockholders from realizing any change-of-control premium on shares of our common stock that may otherwise accrue to Cellectis on its private sale of our common stock. Additionally, if Cellectis privately sells its significant equity interest in our company, we may become subject to the control of a presently unknown third party. Such third party may have conflicts of interest with those of other stockholders. In addition, if Cellectis sells a controlling interest in our company to a third party, Cellectis may terminate the license agreement and other transitional arrangements, and our other commercial agreements and relationships could be impacted, all of which may adversely affect our ability to run our business as described herein and may have a material adverse effect on our operating results and financial condition.

***We are a "controlled company" within the meaning of the rules of the NASDAQ and, as a result, rely on exemptions from certain corporate governance requirements. Our stockholders do not have the same protections afforded to stockholders of companies that are subject to such requirements.***

Because Cellectis controls a majority of the voting power of our outstanding common stock, we are a "controlled company" within the meaning of the corporate governance standards of the NASDAQ. Under these rules, a listed

company of which more than 50% of the voting power is held by an individual, group or another company is a "controlled company" and may elect not to comply with certain corporate governance requirements, including:

- the requirement that a majority of the board of directors consist of independent directors;
- the requirement that our nominating and corporate governance committee be composed entirely of independent directors with a written charter addressing the committee's purpose and responsibilities;
- the requirement that our compensation committee be composed entirely of independent directors with a written charter addressing the committee's purpose and responsibilities; and
- the requirement for an annual performance evaluation of our corporate governance and compensation committees.

While Cellectis controls a majority of the voting power of our outstanding common stock, we may not have a majority of independent directors or corporate governance and compensation committees consisting entirely of independent directors and we will not be required to have written charters addressing these committees' purposes and responsibilities or have annual performance evaluations of these committees. Accordingly, you will not have the same protections afforded to stockholders of companies that are subject to all of the corporate governance requirements of the NASDAQ.

***Cellectis may compete with us.***

Cellectis is not restricted from competing with us in the plant sciences industry business, including as a result of acquiring a company that operates an agricultural biotechnology business. Due to the significant resources of Cellectis, including financial resources, name recognition and know-how resulting from the previous management of our business, Cellectis could have a significant competitive advantage over us should it decide to engage in the type of business we conduct, which may cause our operating results and financial condition to be materially adversely affected.

***Certain of our directors may have actual or potential conflicts of interest because of their positions with Cellectis.***

Dr. André Choulika, Mr. Alain Godard and Mr. Laurent Arthaud each serve on our Board of Directors and also have senior positions as directors or officers of Cellectis. Mr. Godard and Mr. Arthaud have announced their intention not to stand for reelection to our board of directors at our 2019 annual meeting of shareholders. These directors may own Cellectis ordinary shares and options to purchase Cellectis ordinary shares and other Cellectis equity awards. These individuals' holdings of Cellectis ordinary shares, options to purchase ordinary shares of Cellectis and other equity awards may be significant for some of these persons compared to these persons' total assets. Their position at Cellectis and the ownership of any Cellectis equity or equity awards creates, or may create the appearance of, conflicts of interest when these directors are faced with decisions that could have different implications for Cellectis than the decisions have for us.

***Cellectis and its directors and officers have limited liability to us or you for breach of fiduciary duty.***

Our Certificate of Incorporation provides that, subject to any contractual provision to the contrary, Cellectis will have no obligation to refrain from:

- engaging in the same or similar business activities or lines of business as we do;
- doing business with any of our clients or consumers; or
- employing or otherwise engaging any of our officers or employees.

Under our Certificate of Incorporation, neither Cellectis nor any officer or director of Cellectis, except as provided in our Certificate of Incorporation, is liable to us or to our stockholders for breach of any fiduciary duty by reason of any of these activities.

***Cellectis currently performs or supports many of our important corporate functions. We incur significant charges and incremental costs as a standalone public company.***

Cellectis currently performs or supports many important corporate functions for our company, including certain general management, finance, investor relations, communication, legal, intellectual property, human resources and information technology services. Because we rely on Cellectis to perform these functions, we bear the risk of having less direct control over their manner of performance than we would if performed by our employees. Many of these services are governed by our management services agreement with Cellectis pursuant to which, in consideration for such services, we reimburse Cellectis for all costs and expenses reasonably incurred in connection with their provision and pay a mark-up corresponding to a percentage of certain of the costs and expenses, which ranges from zero to 10%. Our financial statements reflect charges for these services on an allocation basis.

Under the management services agreement we are able to use these Cellectis services for one-year terms, which are automatically renewed. However, either party has the right to terminate the agreement at the anniversary of the agreement by giving three months' prior notice. In addition, either party is able to terminate the agreement due to a material breach of the other party, upon prior written notice, subject to limited cure periods and certain change of control, sale and bankruptcy events.

We may not be able to replace these services or enter into appropriate third-party agreements on terms and conditions, including cost, comparable to those that we will receive from Cellectis under our management services agreement. Additionally, after the agreement terminates, we may be unable to sustain the services at the same levels or obtain the same benefits as when we were receiving such services and benefits from Cellectis. We may need to replicate or replace certain functions, systems and infrastructures to which we would no longer have access. We may also need to make investments or hire additional employees to operate without the same access to Cellectis' operational and administrative infrastructure. When we begin to operate these functions separately, if we do not have our own adequate systems and business functions in place, or are unable to obtain them from other providers, we may not be able to operate our business effectively or at comparable costs, and our profitability may decline. In addition, we have historically received informal support from Cellectis, which may not be addressed in our management services agreement.

**Risks Related to Ownership of Our Common Stock**

***The requirements of being a U.S. public company require significant resources and management attention and affect our ability to attract and retain executive management and qualified board members.***

As a U.S. public company, we incur significant legal, accounting, and other expenses. We are subject to the Exchange Act, including the reporting requirements thereunder, the Sarbanes-Oxley Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the NASDAQ listing requirements and other applicable securities rules and regulations. Compliance with these rules and regulations results in significant legal and financial compliance costs, makes some activities more difficult, time-consuming or costly and places substantial demand on our systems and resources. We expect the burdens of compliance obligations to increase after we cease to be an "emerging growth company."

Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, or Section 404, we are required to furnish a report by our management on our internal control over financial reporting, including an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. However, while we remain an emerging growth company, we will not be required to include this attestation report on internal control over financial reporting issued by our independent registered public accounting firm. When our independent registered public accounting firm is required to undertake an assessment of our internal control over financial reporting, the cost of complying with Section 404 will significantly increase and management's attention may be diverted from other business concerns, which could adversely affect our business and results of operations. We

may need to hire more employees in the future or engage outside consultants to comply with these requirements, which will further increase our cost and expense. If we fail to implement the requirements of Section 404 in the required timeframe, we may be subject to sanctions or investigations by regulatory authorities, including the SEC and the NASDAQ. Furthermore, if we are unable to conclude that our internal control over financial reporting is effective, we could lose investor confidence in the accuracy and completeness of our financial reports, the market price of shares of our common stock could decline, and we could be subject to sanctions or investigations by regulatory authorities. Failure to implement or maintain effective internal control systems required of public companies could also restrict our future access to the capital markets. In addition, enhanced legal and regulatory regimes and heightened standards relating to corporate governance and disclosure for public companies result in increased legal and financial compliance costs and make some activities more time consuming.

***The market price of our common stock has experienced volatility since our initial public offering in July 2017.***

Prior to our initial public offering, or IPO, there had been no public market for shares of our common stock. Since our initial public offering in July 2017, the market price of our common stock has experienced, and may continue to experience, volatility in response to various factors. Some factors that may cause the market price of our common stock to fluctuate, in addition to the other risks mentioned in this section of this Annual Report on Form 10-K, are:

- actual or anticipated fluctuations in our financial condition and operating results;
- our failure to develop and commercialize our product candidates;
- actual or anticipated changes in our growth rate relative to our competitors;
- competition from existing products or new products that may emerge;
- announcements by us, Cellectis, our R&D partners or our competitors of or related to significant acquisitions, strategic partnerships, joint ventures, strategic alliances, or capital commitments;
- the imposition of regulatory requirements on any of our product candidates to be sold in North America;
- the inability to establish additional strategic alliances;
- unanticipated serious safety concerns related to the use of any of our products once commercialized;
- failure to meet or exceed financial estimates and projections of the investment community or that we provide to the public;
- issuance of new or updated research or reports by securities analysts;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- common stock price and volume fluctuations attributable to inconsistent trading volume levels of our common stock;
- additions or departures of key management or scientific personnel;
- disputes or other developments related to proprietary rights, including patents, litigation matters, and our ability to obtain patent protection for our technologies;
- announcement or expectation of additional equity or debt financing efforts;
- sales of common stock by us, Cellectis, our insiders or our other stockholders;
- announcements or actions taken by Cellectis as our principal stockholder; and
- general economic and market conditions.

These and other market and industry factors may cause the market price and demand for our common stock to fluctuate substantially, regardless of our actual operating performance, which may limit or prevent investors from readily selling their common stock and may otherwise negatively affect the liquidity of our common stock. In addition, the stock market in general, and agricultural biotechnology companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies.

***Our historical financial information is not necessarily representative of the results we would have achieved as a standalone company and may not be a reliable indicator of our future results.***

We are a majority-owned subsidiary of Cellectis. As a result, our historical financial information does not reflect the financial condition, results of operations or cash flows we would have achieved as a standalone company and not a subsidiary of Cellectis during the periods presented or those we will achieve in the future. This is primarily the result of the following factors:

- our historical financial information reflects expense allocations for certain support functions that are provided on a centralized basis within Cellectis, such as expenses for business technology, facilities, legal, finance, human resources and business development that may be higher or lower than the comparable expenses we would have actually incurred, or will incur in the future, as a standalone company and not a subsidiary of Cellectis; and
- significant increases in our cost structure as a result of becoming a public company, including costs related to public company reporting, investor relations and compliance with the Sarbanes-Oxley Act, which expenses may increase at such time as we operate as a standalone company and not a subsidiary of Cellectis.

As a result of the separation, it may be difficult for investors to compare our future results to historical results or to evaluate our relative performance or trends in our business.

***Future sales of common stock by Cellectis or others of our common stock, or the perception that such sales may occur, could depress the market price of our common stock.***

As of December 31, 2018, Cellectis owned approximately 69.5% of our outstanding shares of common stock. Subject to the restrictions described in the paragraph below, future sales of these shares in the public market will be subject to the volume and other restrictions of Rule 144 under the Securities Act for so long as Cellectis is deemed to be our affiliate, unless the shares to be sold are registered with the SEC. We are unable to predict with certainty whether or when Cellectis will sell a substantial number of shares of our common stock. The sale by Cellectis of a substantial number of shares, or a perception that such sales could occur, could significantly reduce the market price of our common stock.

***If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, the price of our common stock and trading volume could decline.***

The trading market for our common stock depends in part on the research and reports that securities or industry analysts publish about us or our business. If few or no securities or industry analysts cover us, the trading price for our common stock would be negatively impacted. If one or more of the analysts who covers us downgrades our common stock or publishes incorrect or unfavorable research about our business, the price of our common stock would likely decline. If one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, or downgrades our common stock, demand for our common stock could decrease, which could cause the price of our common stock or trading volume to decline.

***We do not intend to pay dividends on our common stock.***

We do not intend to pay any dividends to holders of our common stock for the foreseeable future. We currently intend to invest our future earnings, if any, to fund our growth. Therefore, shareholders are not likely to receive any dividends on common stock for the foreseeable future, and the success of an investment in our common stock will depend upon any future appreciation in its value. Consequently, investors may need to sell all or part of their holdings of our common stock after price appreciation, which may never occur, as the only way to realize any future gains on their investment. There is no guarantee that our common stock will appreciate in value or even maintain the price at which our stockholders have purchased our common stock. Investors seeking cash dividends should not purchase our common stock.

***Provisions in our Certificate of Incorporation, By-laws and Delaware law may prevent or delay an acquisition of us, which could decrease the trading price of our common stock.***

Our Certificate of Incorporation and By-laws contain provisions that are intended to deter coercive takeover practices and inadequate takeover bids and to encourage prospective acquirers to negotiate with our Board of Directors rather than to attempt a hostile takeover. These include the following provisions that become effective once Cellectis' no longer holds at least 50% of our outstanding shares of common stock:

- a Board of Directors that is divided into three classes with staggered terms;
- rules regarding how our stockholders may present proposals or nominate directors for election at stockholder meetings;
- the right of our Board of Directors to issue preferred stock without stockholder approval; and
- limitations on the right of stockholders to remove directors.

These provisions could make it more difficult for a third party to acquire us, even if the third party's offer may be considered beneficial by many stockholders. As a result, stockholders may be limited in their ability to obtain a premium for their shares. See "Description of Capital Stock" for a discussion of these provisions.

***We are an "emerging growth company" and we cannot be certain if the reduced disclosure requirements applicable to emerging growth companies will make our common stock less attractive to investors.***

We are an "emerging growth company," as defined in the JOBS Act, and take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies" including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, and reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements. We cannot predict if investors will find our common stock less attractive because of our reliance on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

## ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

## ITEM 2. PROPERTIES.

We leased office space in New Brighton, Minnesota under an operating lease until June 2018.

In June 2018 we began to lease a 40,000 square-foot corporate headquarters facility in Roseville, Minnesota. The facility includes office, research laboratory space, a demonstration test kitchen and outdoor growing plots, including greenhouses.

## ITEM 3. LEGAL PROCEEDINGS.

We are not a party to any material pending legal proceeding as of December 31, 2018. From time to time, we may be involved in legal proceedings arising in the ordinary course of business.

## ITEM 4. MINE SAFETY DISCLOSURES.

Not Applicable.

**PART II**

**ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES.**

Our common stock has traded on the NASDAQ Global Market under the ticker symbol of CLXT since our initial public offering on July 25, 2017. Prior to that time, there was no established public trading market for our common stock.

**Holders of Common Stock**

As of March 8, 2019, there were 4 holders of record of 32,688,629 outstanding shares of our common stock. The number of holders of record of our common stock does not reflect the number of beneficial holders whose shares are held by banks, depositaries, brokers or other nominees.

**Dividends**

We have not paid dividends on our common stock, and do not currently plan to pay any cash dividends in the foreseeable future.

***Stock Performance Graph***

The following graph shows a comparison from July 20, 2017 (the date our common stock commenced trading on The NASDAQ Global Market) through December 31, 2018 of the cumulative total return for our common stock, the Standard & Poor's 500 Stock Index (S&P 500 Index) and the NASDAQ Composite Index (NASDAQ Composite). The graph assumes that $100 was invested at the close of the market on July 20, 2017 in our common stock, the S&P 500 Index and the NASDAQ Composite, and data for the S&P 500 Index and the NASDAQ Composite assumes reinvestments of dividends. The stock price performance of the following graph is not necessarily indicative of future stock price performance.


*This performance graph shall not be deemed soliciting material or to be filed with the SEC for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act or the Exchange Act.*

## ITEM 6. SELECTED FINANCIAL DATA.

The following sets forth selected financial data for each of the fiscal years in the four-year period ended December 31, 2018. This selected financial data should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and the financial statements and related notes included in this Annual Report on Form 10-K. Our historical results are not necessarily indicative of the results that may be expected in the future.

| | As of and for the year ended December 31, | | | |
|---|---|---|---|---|
| **In Thousands, Except for Share and Per Share Data** | **2018** | **2017** | **2016** | **2015** |
| **Operating data:** | | | | |
| Revenue | **$ 236** | $ 508 | $ 399 | $ 1,272 |
| Research and development expenses | **$ 9,846** | $ 11,556 | $ 5,638 | $ 2,766 |
| Selling, general, and administrative expenses | **$ 18,505** | $ 14,741 | $ 6,670 | $ 3,569 |
| Net losses | **$ (27,897)** | $ (25,980) | $ (12,086) | $ (5,889) |
| Losses per share | **$ (0.91)** | $ (1.12) | $ (0.62) | $ (0.88) |
| Weighted average shares outstanding | **30,683,421** | 23,153,661 | 19,600,000 | 6,725,740 |
| Anti-dilutive stock awards | **4,253,301** | 5,257,365 | 1,930,600 | 339,937 |
| **Balance sheet data:** | | | | |
| Cash and cash equivalents | **$ 93,794** | $ 56,664 | $ 5,026 | $ 24,687 |
| Land, buildings, and equipment | **$ 21,850** | $ 14,353 | $ 10,994 | $ 915 |
| Total assets | **$ 118,791** | $ 72,167 | $ 16,623 | $ 25,995 |
| Financing lease obligations, excluding current portion | **$ 18,227** | $ 10,148 | $ — | $ — |
| **Cash flow data:** | | | | |
| Net cash used in operations | **$ (20,252)** | $ (12,785) | $ (9,237) | $ (6,691) |
| Capital expenditures | **$ 1,847** | $ 779 | $ 10,424 | $ 665 |
| **Share data:** | | | | |
| Low stock price | **$ 9.33** | $ 10.44 | $ — | $ — |
| High stock price | **$ 26.42** | $ 31.38 | $ — | $ — |
| Closing stock price at December 31 | **$ 10.36** | $ 22.03 | $ — | $ — |

## ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

### EXECUTIVE OVERVIEW

We are a healthy food ingredient company. We leverage proprietary intellectual property, our technical expertise, and an end-to-end supply chain to deliver healthier food ingredients, such as healthier oils and high fiber wheat, to consumers.

Using our proprietary technologies and expertise, including TALEN gene-editing technology exclusively licensed to us in the field of agriculture, we develop food crops with targeted traits quickly and more cost effectively than traditional methods. We believe that we are able to identify a consumer need and develop a product from "concept to fork" in cycles as short as six years by utilizing these proprietary technologies.

We believe that we are well-positioned to address consumer preferences that are evolving to demand healthier, more nutritionally rich foods. To bring our consumer-centric products to the marketplace, we intend to repurpose and leverage existing supply chain capacity by contracting, tolling or partnering with players in the existing supply chain, such as seed production companies, seed distributors, farmers, crushers, millers, and refiners. We expect this will allow us to apply our resources to maximizing innovation and product development while minimizing our capital expenditures and overhead. We intend to strategically out-license our intellectual property to maximize our market opportunity.

Our first commercial product is a High Oleic Soybean designed to produce a healthier oil that has increased heat stability with zero trans fats per serving. We completed our first sales of our High Oleic Soybean Oil and High Oleic Soybean Meal in the first quarter of 2019. Among our other product candidates are other soybean products and a High Fiber Wheat.

We are an early-stage company and have incurred net losses since our inception. At December 31, 2018, we had an accumulated deficit of $82.4 million. Our net losses were $27.9 million for the year ended December 31, 2018, $26.0 million for the year ended December 31, 2017, and $12.1 million for the year ended December 31, 2016. Costs incurred in connection with our R&D programs and to compensate our employees, including non-cash stock compensation expense, are the primary drivers of our net loss. As we continue to develop our product pipeline, we expect to continue to incur significant expenses and increasing operating losses for the foreseeable future and those expenses and losses may fluctuate significantly from quarter-to-quarter and year-to-year. We expect that our expenses will increase substantially as we:

- establish a sales, marketing and distribution infrastructure, including relationships across our supply chain, to commercialize any products that have completed the development process;
- conduct additional field trials of our current and future product candidates;
- secure manufacturing arrangements for commercial production;
- continue to advance the R&D of our current and future product candidates;
- seek to identify and validate additional product candidates;
- acquire or in-license other product candidates, technologies, germplasm or other biological material;
- are required to seek regulatory and marketing approvals for our product candidates;
- make royalty and other payments under any in-license agreements;
- maintain, protect, expand and defend our intellectual property portfolio;
- seek to attract and retain new and existing skilled personnel; and
- experience any delays or encounter issues with any of the above.

At December 31, 2018, we had cash, cash equivalents and restricted cash of $95.3 million. We do not expect to generate significant revenue from product sales unless and until we are able to fully commercialize one or more of our current or future product candidates, which may take a number of years and is subject to significant uncertainty. Until such time that we can generate substantial revenues from sales of our product candidates, if ever, we expect to finance our operating activities through a combination of cash on hand, equity offerings, debt financings, government or other third-party funding, and licensing arrangements. However, we may be unable to raise additional funds or enter into such arrangements when needed on favorable terms, or at all, which would have a negative impact on our financial condition and could force us to delay, limit, reduce or terminate our development programs or commercialization efforts or grant to others rights to develop or market product candidates that we would otherwise prefer to develop and market ourselves. Failure to receive additional funding could cause us to cease operations, in part or in full.

**COMPARABILITY OF OUR RESULTS AND OUR RELATIONSHIP WITH CELLECTIS**

We are a majority-owned subsidiary of Cellectis. As a result, our historical financial information does not reflect the financial condition, results of operations or cash flows we would have achieved as a standalone company and not a subsidiary of Cellectis during the periods presented or those we will achieve in the future. This is primarily the result of the following factors:

- our historical financial information reflects expense allocations for certain support functions that are provided on a centralized basis within Cellectis, such as expenses for business technology, facilities, legal, finance, human resources and business development that may be higher or lower than the comparable expenses we would have actually incurred, or will incur in the future, as a standalone company and not a subsidiary of Cellectis; and
- significant increases in our cost structure as a result of becoming a public company, including costs related to public company reporting, investor relations and compliance with the Sarbanes-Oxley Act, which expenses may increase at such time as we operate as a standalone company and not a subsidiary of Cellectis.

In connection with our initial public offering in July 2017, we and Cellectis entered into certain agreements that relate to our relationship with Cellectis and provide a framework for our ongoing relationship with Cellectis. These agreements include a management services agreement, pursuant to which Cellectis provides certain services to us, a stockholder's agreement, which provides Cellectis with certain contractual rights for so long as it maintains threshold beneficial ownership levels, and a license agreement, pursuant to which we have been granted exclusive, worldwide license to certain key intellectual property owned by Cellectis. In the future, we expect to incur internal costs to implement certain new systems, including infrastructure and an enterprise resource planning system.

**RESULTS OF OPERATIONS FOR YEARS ENDED DECEMBER 31, 2018, 2017 AND 2016**

In 2018 we continued to develop our High Oleic Soybean for commercial launch. Our revenues were from the licensing of our technology to others. We continued to incur costs associated with commercialization, including purchasing grain from farmers as R&D activity. Upon achieving commercialization, we will capitalize purchases of grain as inventory. A summary of our results of operations for the years ended December 31, 2018, 2017 and 2016 follows:

| | Year Ended December 31, | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **2018** | **2017** | **$ Change** | **% Change** | **2017** | **2016** | **$ Change** | **% Change** |
| | **(In thousands, except percentage values)** | | | | | | | |
| Revenue | **$ 236** | $ 508 | $ (272) | (53.5)% | $ 508 | $ 399 | $ 109 | 27.3% |
| Cost of revenue | **—** | — | — | — | — | 200 | 200 | nm |
| Research and development expense | **9,846** | 11,556 | (1,710) | (14.8)% | 11,556 | 5,638 | 5,918 | 105% |
| Selling, general and administrative expense | **18,505** | 14,741 | 3,764 | 25.5% | 14,741 | 6,670 | 8,071 | 121% |
| Interest expense, net | **264** | (1) | 265 | nm | (1) | (5) | 4 | nm |
| Other income and expense | **(46)** | (190) | 144 | 75.8% | (190) | 28 | (218) | nm |
| Net loss | **$ (27,897)** | $ (25,980) | $(1,917) | 7.8% | (25,980) | (12,086) | (13,894) | 115% |

***Revenue***

In 2017, we made a strategic decision to focus on in-house development of product candidates and to reduce the amount of subcontracted R&D that we were performing for third parties. As a result of the termination of certain agreements, all remaining deferred revenue was recognized resulting in the increase in revenue in 2017 compared to 2016 and the decline in 2018 compared to 2017.

***Research and development expenses***

Our R&D expenses consist primarily of:

- personnel costs, including salaries and related benefits, including non-cash stock option expense, for our employees engaged in scientific R&D functions;
- cost of third-party contractors and third-party contractors who support our product candidate development;
- seed costs for small-scale and large-scale testing of trait validation;
- purchases and manufacturing of biological materials:
- costs for and to operate facilities including laboratories and greenhouses;
- costs to acquire grains for R&D purposes prior to achieving commercial milestones; and
- costs of in-licensing or acquiring technology from third parties.

The decrease in 2018 was primarily due to decreases in non-cash stock compensation expense of $5.5 million partially offset by increases in costs to acquire grain prior to commercialization of $2.8 million and employee-related costs.

The 2017 increase was due to non-cash stock compensation expense of $6.1 million associated with accelerated vesting of awards from our IPO and an increase in sub-contracted R&D, including third-party germplasm breeding, third-party germplasm trials and meal and oil product testing.

Due to the number of ongoing projects and our ability to use resources across several projects, we do not record or maintain information regarding the costs incurred for our R&D programs on a program-specific basis.

***Selling, general, and administrative expenses***

The 2018 increase was due to costs incurred to increase our headcount in advance of the anticipated commercialization of our first product and increases in professional services expenses associated with being a public company and turnover in our executive ranks, partially offset by a decrease in non-cash stock compensation expense of $2.2 million.

The 2017 increase was due to non-cash stock compensation expense of $6.0 million associated with accelerated vesting of awards from our IPO, increased personnel expenses and increased legal and professional fees, partially offset by reduced management fees.

***Interest, net***

Interest, net is the result of interest income resulting from investments of cash and cash equivalents, partially offset by interest expense on our financing lease obligations. It has remained relatively constant over time, driven by balances, yields, and timing of our capital raises and financing activities.

**LIQUIDITY AND CAPITAL RESOURCES**

***Liquidity***

Until the completion of our IPO in July 2017, we funded our operations primarily through cash infusions provided by Cellectis. On July 25, 2017, we completed our IPO of common stock. In the aggregate, we received net proceeds from the IPO of approximately $58.0 million, after deducting underwriting discounts and commissions of $3.1 million and offering expenses totaling approximately $3.3 million.

On May 22, 2018, we completed a follow-on offering of our common stock. We sold an aggregate of 4,057,500 shares at a public offering price of $15.00 per share. In the aggregate, we received net proceeds from the follow-on offering of approximately $57.0 million, after deducting underwriting discounts and commissions of $3.2 million and offering expenses of $0.7 million.

As of December 31, 2018, we had cash, cash equivalents and restricted cash of $95.3 million.

We incurred losses from operations of $27.9 million for the year ended December 31, 2018, $26.0 million for the year ended December 31, 2017, and $12.1 million for the year ended December 31, 2016. As of December 31, 2018, we had an accumulated deficit of $82.4 million and we expect to incur losses for the foreseeable future.

***Cash Flows from Operating Activities***

| In Thousands | Year Ended December 31, 2018 | 2017 | 2016 |
|---|---|---|---|
| Net loss | **$ (27,897)** | $ (25,980) | $ (12,086) |
| Depreciation | **1,081** | 551 | 345 |
| Loss on disposal of land, building, and equipment | **23** | - | - |
| Stock-based compensation | **4,385** | 12,092 | 948 |
| Unrealized transaction gain (loss) on related party activity | **(12)** | (34) | - |
| Changes in operating assets and liabilities | **2,168** | 586 | 1,556 |
| Net cash used by operating activities | **$ (20,252)** | $ (12,785) | $ (9,237) |

Net cash used by operating activities was $20.3 million in 2018 compared to net cash used by operating activities in 2017 of $12.8 million. The increase was due to expenses related to increased headcount and legal and professional fees associated with expanding our commercial infrastructure and investing in our R&D pipeline, including purchasing grain in advance of our commercialization of our first product candidate, High Oleic Soybean Oil.

Net cash used in operating activities was $12.8 million in 2017 compared to net cash used in operating activities in 2016 of $9.2 million. The increase was due to expenses related to increased head count and legal and professional fees associated with becoming a publicly traded company, partially offset by a reduction in management fees, as the increase in the net loss was nearly all from an increase in non-cash stock compensation expense.

***Cash Flows from Investing Activities***

| In Thousands | Year Ended December 31, 2018 | 2017 | 2016 |
|---|---|---|---|
| Purchases of land, building, and equipment | **$ (1,847)** | $ (779) | $ (10,424) |
| Other | **50** | - | - |
| Net cash used by investing activities | **$ (1,797)** | $ (779) | $ (10,424) |

Net cash used by investing activities was $1.8 million in 2018 compared to net cash used by investing activities in 2017 of $0.8 million. The majority of the cash used in investing in 2018 was related to purchases of fixtures and equipment for our new headquarters facility. The majority of cash used in investing activities in 2017 was related to site improvements and architect fees for the design of our headquarters, and related equipment purchases.

Net cash used by investing activities was $0.8 million in 2017 compared to net cash used by investing activities in 2016 of $10.4 million. The majority of cash used in investing activities in 2017 was related to site improvements and architect fees for the design of our new corporate headquarters in Roseville, Minnesota, and equipment purchases. The majority of cash used in investing activities in 2016 was related to the purchase of the land for our headquarters and the construction of greenhouses at the new corporate headquarters.

***Cash Flows from Financing Activities***

| In Thousands | Year Ended December 31, 2018 | 2017 | 2016 |
|---|---|---|---|
| Proceeds from issuance of common stock | **$ 57,706** | $ 61,292 | $ - |
| Costs incurred related to the issuance of common stock | **(665)** | (3,312) | - |
| Advances from Cellectis | **-** | 3,000 | - |
| Repayment of advances from Cellectis | **-** | (3,000) | - |
| Proceeds from the exercise of stock options | **2,622** | 265 | - |
| Purchases of common stock | **(230)** | - | - |
| Proceeds from sale and leaseback of land, buildings, and equipment | **1,240** | 6,957 | - |
| Net cash provided by financing activities | **$ 60,673** | $ 65,202 | $ - |

Net cash provided by financing activities was $60.7 million in 2018 compared to net cash provided by financing activities in 2017 of $65.2 million. The decrease was due to lower net proceeds from capital raising activity year over year, as changes in the proceeds from the exercise of stock options and from our sale and leaseback activities largely offset. Net cash provided by financing activities was $65.2 million in 2017 compared to net cash used in financing activities in 2016 of zero. The increase was due to net cash proceeds from the IPO and the proceeds from the sale of land and improvements as part of the construction of our new corporate headquarters.

Taking into account our anticipated cash burn rate, we believe our cash, cash equivalents and restricted cash as of December 31, 2018 will be sufficient to fund our operations through at least early 2021. Changes in our forward purchase contract obligations and ability to obtain working capital financing may impact these projections. As a result, there can be no assurance we will be able to do so or that we will ever operate profitably.

**CAPITAL RESOURCES**

We have $258 thousand of long-term financing obligations maturing in the next 12 months that is classified as current. We believe that available cash, cash equivalents, restricted cash and short-term and long-term lease financing will be adequate to meet our liquidity and capital needs for at least the next 12 months.

***Operating Capital Requirements***

As of December 31, 2018, we had not generated any revenues from product sales. We anticipate that we will continue to generate losses for the foreseeable future, and we expect the losses to increase as we continue to incur substantial expenses related to our public company obligations, the continued development of our product candidates, and the commercialization of our product candidates that complete the development process. We anticipate that we will need additional funding in connection with our continuing operations, including for the further development of our existing product candidates and to pursue other development activities related to additional product candidates.

Until we can generate a sufficient amount of revenue from our products, if ever, we expect to finance a portion of future cash needs through cash on hand and public or private equity or debt financings. Additional capital may not be available on reasonable terms, if at all. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of one or more of our product candidates. If we raise additional funds through the issuance of additional debt or equity securities, it could result in dilution to our existing stockholders and increased fixed payment obligations, and these securities may have rights senior to those of our common shares. Any of these events could significantly harm our business, financial condition and prospects.

The period of time through which our financial resources will be adequate to support our operations is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors. We have based this estimate on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. Our future funding requirements, both near and long-term, will depend on many factors, including, but not limited to:

- the initiation, progress, timing, costs and results of field trials for our product candidates;
- the outcome, timing and cost of compliance with all regulatory obligations imposed by U.S. and non-U.S. regulatory authorities, including the possibility that regulatory authorities will require that we perform studies;
- the ability of our product candidates to progress through late stage development successfully, including through field trials;
- the cost of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights;
- our need to expand our R&D activities;
- our need and ability to hire additional personnel;
- our need to implement additional infrastructure and internal systems;
- the effect of competing technological and market developments; and
- the cost of establishing sales, marketing and distribution capabilities for any products we commercialize.

If we cannot expand our operations or otherwise capitalize on our business opportunities because we lack sufficient capital, our business, financial condition and results of operations could be materially adversely affected.

**CONTRACTUAL OBLIGATIONS, COMMITMENTS AND CONTINGENCIES**

***Forward Purchase Contracts***

We enter into purchase agreements for grain with settlement values based on commodity futures market prices. These agreements allow our counterparty to fix their sale prices to us at various times as defined in the contract. Any realized and unrealized gains and losses from these contracts have been recorded as R&D expenses because we had yet to commercialize the associated product. The fair market value for these contracts is estimated based on commodity futures market prices. Increases or decreases in these prices will impact the values of these contracts and could lead to significant changes in our financial condition, results of operations and cash flows from operating activities.

***Sale-Leaseback of Headquarters and Lab Facility***

In September 2017 we consummated a sale-leaseback transaction with a third party for our corporate headquarters and lab facility.

The headquarters facility is composed of a 40,000 square-foot office and lab building, with greenhouses and outdoor research plots. We are deemed the owner for accounting purposes. The lease has a term of twenty years, with four options to extend its term for five years, each subject to there being no default under the lease terms beyond any cure period and us occupying the property at the time of extension. In 2017 we received $7 million in connection with the sale of the land and uncompleted facility. The facility serves as our corporate headquarters and lab facilities.

We obtained a temporary certificate of occupancy in May 2018 and the lease commenced. Under the lease, we pay an annual base rent of eight percent of the total project cost with scheduled increases in rent of 7.5 percent on the sixth, eleventh and sixteenth anniversaries of the start of the lease commencement as well as on the first day of each renewal term. Currently, we pay an annual base rent of approximately $1.4 million.

We are also responsible for all operating costs and expenses associated with the property. Beginning on the eighteenth month anniversary of the start of the lease, if the landlord decides to sell the property, we have a right of first refusal to purchase the property on the same terms offered to any third party.

Concurrent with entering into the lease, Cellectis guaranteed all of our obligations under the lease agreement. Cellectis' guarantee of our obligations will terminate at the end of the second consecutive calendar year in which our tangible net worth exceeds $300 million, as determined in accordance with generally accepted accounting principles. At a point when Cellectis owns 50% or less of our outstanding common stock, we have agreed to indemnify Cellectis for any obligations incurred by Cellectis under its guaranty of our obligations under the lease.

***Sale-Leaseback of Equipment***

In December 2018 we consummated a sale-leaseback transaction with a third party to finance equipment. The lease has a term of four years and we may add up to $1.1 million of future equipment purchases to the financing agreement. We were required to deposit cash into a restricted account in an amount equal to the future rent payments required by the lease.

As of December 31, 2018, we had contractual obligations and commercial commitments as follows:

| In Thousands (a) | Total | Less than 1 year | 1 - 3 years | 4 - 5 years | More than 5 years |
|---|---|---|---|---|---|
| Financing leases (b) | **$ 31,127** | $ 1,715 | $ 3,400 | $ 3,104 | $ 22,908 |
| Operating leases | **191** | 47 | 113 | 31 | — |
| Forward purchase contracts (c) | **12,357** | 7,754 | 4,602 | — | — |
| **Total contractual obligations** | **$ 43,760** | $ 9,538 | $ 8,159 | $ 3,155 | $ 22,908 |

(a) The commitment amounts in the table above are associated with contracts that are enforceable and legally binding and that specify all significant terms, including fixed or minimum services to be used, fixed, minimum or variable price provisions, and the approximate timing of the actions under the contracts.
(b) We have $1.1 million available to finance future purchases of equipment under one of our capital lease agreements as of December 31, 2018.
(c) Forward purchase contracts consist of purchase commitments with growers to purchase grain at a future date.

**OFF BALANCE SHEET OBLIGATIONS**

We do not have any off-balance sheet arrangements as defined in Item 303(a)(4)(ii) of Regulation S-K.

**CRITICAL ACCOUNTING ESTIMATES**

The accompanying discussion and analysis of our financial condition and results of operations are based upon our financial statements and the related disclosures, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires us to make estimates, assumptions and judgments that affect the reported amounts in our financial statements and accompanying notes. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. We believe the following policies to be the most critical to an understanding of our financial condition and results of operations because they require us to make estimates, assumptions and judgments about matters that are inherently uncertain.

***Revenue Recognition***

We previously entered into R&D agreements that consisted of nonrefundable up-front payments, milestone payments, royalties, and R&D services.

For agreements that contain multiple elements, each element within a multiple-element arrangement is accounted for as a separate unit of accounting provided the following criteria are met: the delivered products or services have value to the customer on a standalone basis and, for an arrangement that includes a general right of return relative to the delivered products or services, delivery, or performance of the undelivered product or service is considered probable and is substantially controlled by us. We consider a deliverable to have standalone value if the product or service is sold separately by us or another vendor or could be resold by the customer.

***Forward Purchase Contracts***

We enter into purchase agreements for grain with settlement values based on commodity futures market prices. These agreements allow our counterparty to fix their sale prices to us at various times as defined in the contract. Any realized and unrealized gains and losses from these contracts have been recorded as R&D expenses because we had yet to commercialize the associated product. The fair market value for these contracts is estimated based on commodity futures market prices. Increases or decreases in these prices will impact the values of these contracts and could lead to significant changes in our financial condition, results of operations and cash flows from operating activities.

***Stock-based Compensation***

The valuation of stock options is a critical accounting estimate that requires us to use judgments and assumptions that are likely to have a material impact on our financial statements. As awards are granted we make predictive assumptions regarding future stock price volatility and employee exercise behavior. For more information on these assumptions, please see Note 6 to the Financial Statements in Item 8 of this report.

The estimated fair values of stock options granted and the assumptions used for the Black-Scholes option-pricing model were as follows:

| | 2018 | 2017 | 2016 |
|---|---|---|---|
| Risk-free interest rate | **2.2% - 3.0%** | 1.3% - 2.4% | 0.6% |
| Expected volatility | **40.9% - 57.2%** | 27.4% - 45.1% | 30.0% |
| Expected term (in years) | **5.6 - 10.0** | 1.2 - 10.0 | 5.8 - 6.2 |

The risk-free interest rate for periods during the expected term of the options is based on the U.S. Treasury zero-coupon yield curve in effect at the time of grant. A one percentage point increase in the risk-free interest rate, leaving all other assumptions constant, would increase the grant date fair value by one percent. The expected term is determined using the simplified method or lattice method. An increase in the expected term by 1 year, leaving all other assumptions constant, would increase the grant date fair value by five percent. The volatility assumption is determined using the historical volatility of comparable public companies over the expected term of the option. If all other assumptions are held constant, a one percentage point increase in our volatility assumption, leaving all other assumptions constant, would increase the grant date fair value by one percent. We do not nor do we expect to pay dividends.

To the extent that actual outcomes differ from our assumptions, we are not required to true up grant-date fair value-based expense to final intrinsic values. Historical data has a significant bearing on our forward-looking assumptions. Significant variances between actual and predicted experience could lead to prospective revisions in our assumptions, which could then significantly impact the year-over-year comparability of stock-based compensation expense.

***Income Tax Valuation Allowances***

We provide deferred taxes for deductible and taxable temporary differences. Deferred tax assets are reduced by a valuation allowance when we believe it is more likely than not that some portion or all of the deferred tax assets will not be realized.

**RECENTLY ISSUED ACCOUNTING PRONOUNCEMENTS**

In August 2017, the Financial Accounting Standards Board (FASB) issued new hedge accounting requirements. The new standard amends the hedge accounting recognition and presentation requirements to better align an entity's risk management activities and financial reporting. The new standard also simplifies the application of hedge accounting guidance. The requirements of the new standard are effective for annual reporting periods beginning after December 15, 2018, and interim periods within those annual periods, which for us is the first quarter of fiscal 2020. Early adoption is permitted. We do not expect this guidance to have any impact on our financial statements.

In February 2016, the FASB issued new accounting requirements for accounting, presentation and classification of leases. This will result in most leases being capitalized as a right of use asset with a related liability on our balance sheets. The requirements of the new standard are effective for annual reporting periods beginning after December 15, 2018, and interim periods within those annual periods, which for us is the first quarter of 2020 because we are an emerging growth company. We are in the process of analyzing the impact of this standard on our results of operations and financial position.

In May 2014, the FASB issued new accounting requirements for the recognition of revenue from contracts with customers. Under the new guidance, companies will apply a principles-based five step model to recognize revenue upon the transfer of promised goods or services to customers and in an amount that reflects the consideration for which the company expects to be entitled to in exchange for those goods and services. The requirements of the new standard and its subsequent amendments are effective for annual reporting periods beginning after December 15, 2017, and interim periods within those annual periods, which for us is the first quarter of 2019. We will adopt these requirements using the cumulative effect approach. We have evaluated and documented the impact of the guidance on our current accounting policies and practices and have not identified any material differences resulting from applying the new requirements to our revenue contracts. This guidance will not have a material impact on our results of operations or financial position.

In June 2018, the FASB issued new accounting requirements for share-based payment transactions for acquiring goods and services from nonemployees. We adopted this standard on January 1, 2019, and its adoption did not have a material impact on our financial statements.

**ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.**

Our primary exposure to market risk is commodity price sensitivity. Changes in the prices of certain commodity products could result in higher overall cost along the agricultural supply chain, which may negatively affect our ability to commercialize our products. We will be susceptible to changes in costs in the agricultural industry as a result of factors beyond our control, such as general economic conditions, seasonal fluctuations, weather conditions, size of harvests, demand, food safety concerns, product recalls and government regulations. As a result, we may not be able to anticipate or react to changing costs by adjusting our practices, which could cause our operating results to deteriorate. While we enter into supply agreements for grain settlement values based on commodity futures markets prices, we have not historically engaged in hedging activities to mitigate these risks. As a result, an immediate 10 percent change in commodity futures market prices would have a $0.9 million change in our financial condition and results of operations.

Our second largest exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly because our investments, including cash equivalents, are in the form of money market funds and are invested in U.S. Treasury obligations. However, because of the short-term nature of the duration of our portfolio and the low-risk profile of our investments, we believe an immediate 10 percent change in market interest rates would not have a material impact on the fair market value of our investment portfolio or on our financial condition or results of operations.

We also have foreign exchange exposure from fluctuations in foreign currency exchange rates, primarily as a result of certain receivable and payable balances with Cellectis. The primary currency we have exposure to is the Euro. We believe an immediate 10 percent change in foreign exchange rates would not have a material impact on our financial condition or results of operations.

## ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The financial statements and related financial statement schedules required to be filed are listed in the Index to Financial Statements on page F-1 hereto and are incorporated herein.

## ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE.

None.

## ITEM 9A. CONTROLS AND PROCEDURES.

**Management's Evaluation of Disclosure Controls and Procedures.**

We maintain disclosure controls and procedures that are designed to provide reasonable assurance that information required to be disclosed in our Exchange Act reports is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

Under the supervision of our principal executive officer and principal financial officer, we evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act) as of December 31, 2018. Based on that evaluation, as of December 31, 2018, our principal executive officer and principal financial officer have concluded that our disclosure controls and procedures were effective at the reasonable assurance level.

**Management's Annual Report on Internal Control Over Financial Reporting.**

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act. Our management, including our principal executive officer and principal financial officer, conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework set forth in the "Internal Control—Integrated Framework" issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on an evaluation under that framework, our management concluded that our internal control over financial reporting was effective at the reasonable assurance level as of December 31, 2018.

**Inherent Limitations on Controls and Procedures**

Our management, including the principal executive officer and principal financial officer, does not expect that our disclosure controls and procedures and our internal control over financial reporting will prevent all error and all fraud. A control system, no matter how well designed and operated, can only provide reasonable assurances that the objectives of the control system are met. The design of a control system reflects resource constraints; the benefits of controls must be considered relative to their costs. Because there are inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, for our company have been or will be detected. As these inherent limitations are known features of the disclosure and financial reporting processes, it is possible to design into the processes safeguards to reduce, though not eliminate, these risks. These inherent limitations include the realities that judgments in decision-making can be faulty and that breakdowns occur because of simple error or mistake. Controls can also be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the control. The design of any system of controls is based in part upon certain assumptions about the likelihood of future events. While our disclosure controls and procedures and our internal control over financial reporting are designed to provide reasonable assurance of achieving their objectives, there can be no assurance that any design will succeed in achieving its stated goals under all future conditions. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with the policies or procedures. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

**Changes in Internal Control over Financial Reporting.**

There have been no changes in our internal control over financial reporting identified in connection with the evaluation required by Rules 13a-13(d) and 15d-15(d) of the Exchange Act that occurred during year ended December 31, 2018 that has materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

## ITEM 9B. OTHER INFORMATION.

None.

## PART III

## ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this item concerning our directors, executive officers, and corporate governance matters is incorporated by reference in our 2019 Proxy Statement.

Our Board of Directors has adopted a Code of Business Conduct and Ethics applicable to all officers, directors and employees. Our Code of Business Conduct and Ethics, Corporate Governance Guidelines and the charters of our Audit Committee, Compensation Committee and Nominating and Corporate Governance Committee are available on our website (www.calyxt.com) under “Corporate Governance” in the “Investors” section. We will provide a copy of these documents to any person, without charge, upon request. We intend to make all required disclosures concerning any amendments to, or waivers from, the Code of Business Conduct and Ethics on our website.

## ITEM 11. EXECUTIVE COMPENSATION

The information required by this item regarding executive compensation is incorporated by reference in our 2019 Proxy Statement.

## ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this item regarding security ownership of certain beneficial owners and management is incorporated by reference in our 2019 Proxy Statement.

## ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this item regarding certain relationships and related transactions is incorporated by reference in our 2019 Proxy Statement.

## ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by this item regarding principal accounting fees and services is incorporated by reference in our 2019 Proxy Statement.

## PART IV

## ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(1) Financial Statements

See “Index to Financial Statements” in Item 8, which is incorporated into this Item by reference.

(2) Financial Statement Schedules—Not applicable.

Schedules not filed with this Annual Report on Form 10-K are omitted because of the absence of conditions under which they are required or because the information called for is shown in the financial statements or related notes.

(a)(3) Exhibits

| Exhibit Number | Description |
|---|---|
| 3.1 | Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 of the Company’s Annual Report on Form 10-K filed with the SEC on March 14, 2018) |
| 3.2 | Amended and Restated Bylaws (incorporated by reference to Exhibit 3.2 of the Company’s Quarterly Report on Form 10-Q filed with the SEC on May 7, 2018) |
| 10.1 | Management Services Agreement between Cellectis S.A., Cellectis, Inc. and Calyxt, Inc., dated as of January 1, 2016 (incorporated by reference to Exhibit 10.1 of the Company’s Registration Statement on Form S-1 filed with the SEC on June 23, 2017) |
| 10.2 | Management Services Agreement Amendment dated July 25, 2017 between Cellectis S.A. and Calyxt, Inc. (incorporated by reference to Exhibit 10.2 of the Company’s Annual Report on Form 10-K filed with the SEC on March 14, 2018) |
| 10.3 | Separation Agreement dated July 25, 2017 between Cellectis S.A. and Calyxt, Inc. (incorporated by reference to Exhibit 10.3 of the Company’s Annual Report on Form 10-K filed with the SEC on March 14, 2018) |
| 10.4 | Stockholders Agreement dated July 25, 2017 between Cellectis S.A. and Calyxt, Inc. (incorporated by reference to Exhibit 10.4 of the Company’s Annual Report on Form 10-K filed with the SEC on March 14, 2018) |
| 10.5 | License Agreement dated July 25, 2017 between Cellectis S.A. and Calyxt, Inc. (incorporated by reference to Exhibit 10.5 of the Company’s Annual Report on Form 10-K filed with the SEC on March 14, 2018) |
| 10.6# | Exclusive Patent License Agreement between Regents of the University of Minnesota and Calyxt Inc. (f.k.a. Cellectis Plant Sciences, Inc.), dated December 15, 2014 (incorporated by reference to Exhibit 10.6 of the Company’s Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |
| 10.7# | Commercial License Agreement between Two Blades Foundation and Calyxt, Inc. (f.k.a. Cellectis Plant Sciences, Inc.), dated December 9, 2014 (incorporated by reference to Exhibit 10.7 of the Company’s Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |
| 10.8# | First Amendment to the Commercial License Agreement between Two Blades Foundation and Calyxt, Inc. (f.k.a. Cellectis Plant Sciences, Inc.), dated December 1, 2016 (incorporated by reference to Exhibit 10.8 of the Company’s Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |

| Exhibit Number | Description |
|---|---|
| 10.9# | Letter Agreement between Two Blades Foundation and Calyxt, Inc. (f.k.a. Cellectis Plant Sciences, Inc.), dated December 31, 2015 (incorporated by reference to Exhibit 10.9 of the Company's Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |
| 10.11† | Calyxt, Inc. Equity Incentive Plan (incorporated by reference to Exhibit 10.11 of the Company's Registration Statement on Form S-1 filed with the SEC on June 23, 2017) |
| 10.12† | Form of Stock Option Agreement pursuant to the Calyxt, Inc. Equity Incentive Plan (incorporated by reference to Exhibit 10.12 of the Company's Registration Statement on Form S-1 filed with the SEC on June 23, 2017) |
| 10.13† | Offer Letter between Calyxt, Inc. and Manoj Sahoo, dated February 3, 2017 (incorporated by reference to Exhibit 10.14 of the Company's Annual Report on Form 10-K filed with the SEC on March 14, 2018) |
| 10.14† | Consulting Agreement between Calyxt, Inc. (f.k.a. Cellectis Plant Sciences, Inc.) and Daniel Voytas, dated January 1, 2010 (incorporated by reference to Exhibit 10.15 of the Company's Registration Statement on Form S-1 filed with the SEC on June 23, 2017) |
| 10.15† | Amendment 1 to Consulting Agreement between Calyxt, Inc. (f.k.a. Cellectis Plant Sciences, Inc.) and Daniel Voytas, dated December 21, 2012 (incorporated by reference to Exhibit 10.16 of the Company's Registration Statement on Form S-1 filed with the SEC on June 23, 2017) |
| 10.16† | Calyxt, Inc. 2017 Omnibus Incentive Plan (incorporated by reference to Exhibit 10.20 of the Company's Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |
| 10.17† | Calyxt, Inc. 2017 Stock Option Sub-Plan for French Employees and Directors (incorporated by reference to Exhibit 10.21 of the Company's Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |
| 10.18† | Form of Stock Option Agreement pursuant to the Calyxt, Inc. 2017 Omnibus Incentive Plan (incorporated by reference to Exhibit 10.22 of the Company's Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |
| 10.19† | Form of Restrictive Stock Unit Agreement pursuant to the Calyxt, Inc. 2017 Omnibus Incentive Plan (incorporated by reference to Exhibit 10.23 of the Company's Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |
| 10.20† | Form of Resolution with regard to the Grant of Warrants to purchase shares of Cellectis S.A. (incorporated by reference to Exhibit 10.24 of the Company's Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |
| 10.21† | Calyxt, Inc. 2017 Restricted Stock Unit Sub-Plan for French Employees and Directors (incorporated by reference to Exhibit 10.25 of the Company's Registration Statement on Form S-1/A filed with the SEC on July 3, 2017) |
| 10.22† | Lease Agreement between Calyxt, Inc., as Tenant, and NLD Mount Ridge LLC, as Landlord, dated September 6, 2017 (incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed with the SEC on September 7, 2017) |

| Exhibit Number | Description |
|---|---|
| 10.23 | Form of Indemnification Agreement (incorporated by reference to Exhibit 10.24 of the Company's Annual Report on Form 10-K filed with the SEC on March 14, 2018) |
| 10.24 | Amendment No. 1 to Stockholders Agreement dated May 7, 2018 between Cellectis S.A. and Calyxt, Inc. (incorporated by reference to Exhibit 10.1 of the Company's Quarterly Report on Form 10-Q filed with the SEC on May 7, 2018) |
| 10.25† | Employment Agreement between Calyxt, Inc. and Dr. Yves Ribeill, Ph.D., dated August 22, 2018 (incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed with the SEC on August 24, 2018) |
| 10.26† | Separation Agreement and Release, dated September 11, 2018, between Federico Tripodi and Calyxt, Inc. (incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K/A filed with the SEC on September 17, 2018) |
| 10.27† | Employment Agreement between Calyxt, Inc. and Mr. James A. Blome, dated September 17, 2018 (incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed with the SEC on September 21, 2018) |
| 10.28† | Employment Agreement between Calyxt, Inc. and Mr. Bill Koschak, dated December 21, 2018 (incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed with the SEC on January 3, 2019) |
| 10.29† | Employment Agreement between Calyxt, Inc. and Ms. Debra Frimerman, dated January 21, 2019 |
| 23.1 | Consent of Independent Registered Public Accounting Firm |
| 24.1 | Power of Attorney (included on signature page to this Form 10-K) |
| 31.1 | Certification of the Chief Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) of the Securities Exchange Act |
| 31.2 | Certification of the Chief Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) of the Securities Exchange Act |
| 32& | Certification of the Chief Executive Officer and Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 |
| 101.INS | XBRL Instance Document |
| 101.SCH | XBRL Taxonomy Extension Schema Document |
| 101.CAL | XBRL Taxonomy Extension Calculation Linkbase Document |
| 101.DEF | XBRL Taxonomy Extension Definition Linkbase Document |
| 101.LAB | XBRL Taxonomy Extension Label Linkbase Document |
| 101.PRE | XBRL Taxonomy Extension Presentation Linkbase Document |

# Confidential treatment has been granted for certain information contained in this exhibit. These portions have been omitted and filed separately with the United States Securities and Exchange Commission.

† Indicates management contract or compensatory plan.

& The certifications attached as Exhibit 32 that accompany this Annual Report on Form 10-K are not deemed filed with the SEC and are not to be incorporated by reference into any filing of the registrant under the Securities Act or the Exchange Act, whether made before or after the date of this Form 10-K, irrespective of any general incorporation language contained in such filing.

**ITEM 16. FORM 10-K SUMMARY**

None.

**SIGNATURES**

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

**CALYXT, INC.**

Date: March 11, 2019

By: /s/ James A. Blome
Name: James A. Blome
Title: Chief Executive Officer

**POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints James A. Blome and William F. Koschak each of them, his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and all other documents in connection therewith, with the Securities and Exchange Commission, granting unto each said attorney-in-fact and agents full power and authority to do and perform each and every act in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or either of them or their or his or her substitute or substitutes may lawfully do or cause to be done by virtue hereof.

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

| Signature | Title | Date |
|---|---|---|
| /s/ James A. Blome<br>James A. Blome | Chief Executive Officer<br>(principal executive officer) | March 11, 2019 |
| /s/ William F. Koschak<br>William F. Koschak | Chief Financial Officer<br>(principal financial and accounting officer) | March 11, 2019 |
| /s/ André Choulika<br>André Choulika | Chairman | March 11, 2019 |
| /s/ Philippe Dumont<br>Philippe Dumont | Director | March 11, 2019 |
| /s/ Alain Godard<br>Alain Godard | Director | March 11, 2019 |
| /s/ Anna Ewa Kozicz-Stankiewicz<br>Anna Ewa Kozicz-Stankiewicz | Director | March 11, 2019 |
| /s/ Laurent Arthaud<br>Laurent Arthaud | Director | March 11, 2019 |
| /s/ Yves Ribeill<br>Yves Ribeill | Director | March 11, 2019 |
| /s/ Christopher Neugent<br>Christopher Neugent | Director | March 11, 2019 |
| /s/ Jonathan Fassberg<br>Jonathan Fassberg | Director | March 11, 2019 |
| /s/ Kimberly Nelson<br>Kimberly Nelson | Director | March 11, 2019 |

**CALYXT, INC.**
**INDEX TO FINANCIAL STATEMENTS**

## Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Calyxt, Inc.

**Opinion on the Financial Statements**

We have audited the accompanying balance sheets of Calyxt, Inc. (the Company) as of December 31, 2018 and 2017, the related statements of operations, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

**Basis for Opinion**

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

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

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

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2015.

Minneapolis, Minnesota
March 11, 2019

**CALYXT, INC.**
**BALANCE SHEETS**
**(In Thousands, Except Par Value and Share Amounts)**

| | December 31, 2018 | December 31, 2017 |
|---|---|---|
| **Assets** | | |
| Current assets: | | |
| Cash and cash equivalents | **$ 93,794** | $ 56,664 |
| Restricted cash | **381** | - |
| Due from related parties | **46** | 167 |
| Prepaid expenses and other current assets | **1,301** | 626 |
| Total current assets | **95,522** | 57,457 |
| Non-current restricted cash | **1,113** | - |
| Land, buildings, and equipment | **21,850** | 14,353 |
| Other non-current assets | **306** | 357 |
| **Total assets** | **$ 118,791** | $ 72,167 |
| **Liabilities and stockholders' equity** | | |
| Current liabilities: | | |
| Accounts payable | **$ 818** | $ 1,023 |
| Accrued expenses | **2,007** | 449 |
| Accrued compensation and benefits | **1,305** | 945 |
| Due to related parties | **1,905** | 1,350 |
| Current portion of financing lease obligations | **258** | - |
| Other current liabilities | **711** | 487 |
| Total current liabilities | **7,004** | 4,254 |
| Financing lease obligations | **18,227** | 10,148 |
| Other non-current liabilities | **163** | 289 |
| **Total liabilities** | **25,394** | 14,691 |
| **Stockholders' equity:** | | |
| Common stock, $0.0001 par value; 275,000,000 shares authorized; 32,664,429 shares issued and 32,648,893 shares outstanding as of December 31, 2018 and 27,718,780 shares issued and outstanding as of December 31, 2017 | **3** | 3 |
| Additional paid-in capital | **176,069** | 112,021 |
| Common stock in treasury, at cost, shares of 15,536 | **(230)** | - |
| Accumulated deficit | **(82,445)** | (54,548) |
| **Total stockholders' equity** | **93,397** | 57,476 |
| **Total liabilities and stockholders' equity** | **$ 118,791** | $ 72,167 |

See accompanying notes to the Financial Statements.

**CALYXT, INC.**
**STATEMENTS OF OPERATIONS**
**(In Thousands Except Shares and Per Share Amounts)**

| | Year Ended December 31, | | |
|---|---|---|---|
| | **2018** | **2017** | **2016** |
| Revenue | **$ 236** | $ 508 | $ 399 |
| Operating expenses: | | | |
| Cost of revenue | **-** | - | 200 |
| Research and development | **9,846** | 11,556 | 5,638 |
| Selling, general and administrative | **18,505** | 14,741 | 6,670 |
| Total operating expenses | **28,351** | 26,297 | 12,508 |
| Loss from operations | **(28,115)** | (25,789) | (12,109) |
| Interest, net | **264** | (1) | (5) |
| Foreign currency transaction (loss) gain | **(46)** | (190) | 28 |
| Loss before income taxes | **(27,897)** | (25,980) | (12,086) |
| Income taxes | **-** | - | - |
| Net loss | **$ (27,897)** | $ (25,980) | $ (12,086) |
| Basic and diluted loss per share | **$ (0.91)** | $ (1.12) | $ (0.62) |
| Weighted average shares outstanding - basic and diluted | **30,683,421** | 23,153,661 | 19,600,000 |

See accompanying notes to the Financial Statements.

**CALYXT, INC.**
**STATEMENTS OF STOCKHOLDERS' EQUITY**
**(In Thousands Except Shares Outstanding)**

| | Shares Outstanding | Common Stock | Additional Paid-In Capital | Shares in Treasury | Accumulated Deficit | Total Stockholders' Equity |
|---|---|---|---|---|---|---|
| Balances at January 1, 2016 | 19,600,000 | $ 2 | $ 40,737 | $ - | $ (16,482) | $ 24,257 |
| Stock-based compensation expense | - | - | 948 | - | - | 948 |
| Net loss | - | - | - | - | (12,086) | (12,086) |
| Balances at December 31, 2016 | 19,600,000 | 2 | 41,685 | - | (28,568) | 13,119 |
| Issuance of common stock | 8,050,000 | 1 | 57,979 | - | - | 57,980 |
| Stock options exercised | 68,780 | - | 265 | - | - | 265 |
| Stock-based compensation expense | - | - | 12,092 | - | - | 12,092 |
| Net loss | - | - | - | - | (25,980) | (25,980) |
| Balances at December 31, 2017 | 27,718,780 | 3 | 112,021 | - | (54,548) | 57,476 |
| Issuance of common stock | 4,057,500 | - | 57,041 | - | - | 57,041 |
| Shares purchased | (15,536) | - | - | (230) | - | (230) |
| Stock options exercised | 888,149 | - | 2,622 | - | - | 2,622 |
| Stock-based compensation expense | - | - | 4,385 | - | - | 4,385 |
| Net loss | - | - | - | - | (27,897) | (27,897) |
| **Balances at December 31, 2018** | **32,648,893** | **$ 3** | **$ 176,069** | **$ (230)** | **$ (82,445)** | **$ 93,397** |

See accompanying notes to the Financial Statements.

**CALYXT, INC.**
**STATEMENTS OF CASH FLOWS**
**(In Thousands)**

| | Year Ended December 31, | | |
|---|---|---|---|
| | **2018** | **2017** | **2016** |
| **Operating activities** | | | |
| Net loss | **$ (27,897)** | $ (25,980) | $ (12,086) |
| Adjustments to reconcile net loss to net cash used in operating activities: | | | |
| Depreciation | **1,081** | 551 | 345 |
| Loss on disposal of land, buildings, and equipment | **23** | - | - |
| Stock-based compensation | **4,385** | 12,092 | 948 |
| Unrealized foreign exchange gain (loss) | **(12)** | (34) | - |
| Changes in operating assets and liabilities: | | | |
| Trade accounts receivable | **-** | 110 | 107 |
| Due to/from related parties | **676** | (448) | 1,702 |
| Prepaid expenses and other assets | **(675)** | (537) | (387) |
| Accounts payable | **(193)** | 665 | 53 |
| Accrued expenses | **1,558** | 86 | 137 |
| Accrued compensation and benefits | **360** | 613 | 88 |
| Other accrued liabilities | **442** | 97 | (144) |
| **Net cash used by operating activities** | **(20,252)** | (12,785) | (9,237) |
| **Investing activities** | | | |
| Purchases of land, buildings and equipment | **(1,847)** | (779) | (10,424) |
| Other | **50** | - | - |
| **Net cash used by investing activities** | **(1,797)** | (779) | (10,424) |
| **Financing activities** | | | |
| Proceeds from issuance of common stock | **57,706** | 61,292 | - |
| Costs incurred related to the issuance of common stock | **(665)** | (3,312) | - |
| Advances from Cellectis | **-** | 3,000 | - |
| Repayment of advances from Cellectis | **-** | (3,000) | - |
| Proceeds from the exercise of stock options | **2,622** | 265 | - |
| Purchases of common stock | **(230)** | - | - |
| Proceeds from sale and leaseback of land, buildings, and equipment | **1,240** | 6,957 | - |
| **Net cash provided by financing activities** | **60,673** | 65,202 | - |
| Net increase (decrease) in cash, cash equivalents and restricted cash | **38,624** | 51,638 | (19,661) |
| Cash, cash equivalents and restricted cash - beginning of period | **56,664** | 5,026 | 24,687 |
| **Cash, cash equivalents and restricted cash - end of period** | **$ 95,288** | $ 56,664 | $ 5,026 |

See accompanying notes to the Financial Statements.

**CALYXT, INC.**
**NOTES TO FINANCIAL STATEMENTS**

## 1. ORGANIZATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

***Overview***
Calyxt, Inc., formerly known as Cellectis Plant Sciences, Inc. (the "Company" or "Calyxt"), was founded in 2010 and incorporated in Delaware. We are headquartered in Roseville, Minnesota and are a consumer-centric, food- and agriculture-focused company. Prior to our initial public offering (IPO) on July 25, 2017, we were a majority-owned subsidiary of Cellectis S.A. ("Cellectis"). As of December 31, 2018, Cellectis owned approximately 69.5% of our outstanding common stock.

***Use of Estimates***
The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires us to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes, including those related to revenue recognition, forward purchase contracts, stock-based compensation and valuation allowances on deferred tax assets. Actual results could differ from those estimates.

***Cash, Cash Equivalents, and Restricted Cash***
We consider all investments purchased with an original maturity of three months or less to be cash equivalents.

***Accounts Receivable***
Accounts receivable are unsecured and are recorded at net realizable value. We make judgments as to our ability to collect outstanding receivables based upon patterns of collectability, historical experience, and management's evaluation of specific accounts and will provide an allowance for credit losses when collection becomes doubtful. We perform credit evaluations of our customers' financial condition on an as-needed basis. Payment is generally due 30 days from the invoice date, and accounts past 30 days are individually analyzed for collectability. When all collection efforts have been exhausted, the account is written off against the related allowance.

***Fair Value of Financial Instruments***
We record financial instruments at fair value with changes in those values reported in our results of operations each period. We determine values using readily available market prices, instruments with similar terms and underlying inputs that are quoted on exchanges, or other valuation techniques if no observable inputs are available.

***Land, Buildings and Equipment***
Lands, buildings and equipment is stated at cost less accumulated depreciation. Assets under capital lease are stated at the lesser of their net present value of future lease payments or fair market value. Depreciation is computed based upon the estimated useful lives of the respective assets. Leasehold improvements are amortized using the straight-line method over the shorter of the lease term or the estimated useful life of the assets. Repairs and maintenance costs are expensed as incurred. The cost and accumulated depreciation of property and equipment retired, or otherwise disposed of, are removed from the related accounts, and any residual values are charged to expense. Depreciation expense has been calculated using the following estimated useful lives:

| | |
|---|---|
| Buildings and other improvements | 10–20 years |
| Leasehold improvements | Remaining lease period |
| Office furniture and equipment | 5–7 years |
| Assets under capital lease | 4–20 years |
| Computer equipment and software | 3–5 years |

We review our long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset or asset group may not be recoverable. If the impairment tests indicate that the carrying value of the asset, or asset group is greater than the expected undiscounted cash flows to be generated by

such asset or asset group, further analysis is performed to determine the fair value of the asset or asset group. To the extent the fair value of the asset or asset group is less than its carrying value, an impairment loss is recognized equal to the amount the carrying value exceeds the fair value of the asset or asset group. Assets to be disposed of are carried at the lower of their carrying value or fair value less costs to sell. Fair value is measured using a discounted cash flow model or independent appraisals, as appropriate. We have not recognized any impairment losses in these financial statements.

***Revenue Recognition***

We recognize revenue from R&D agreements and license agreements. Revenues from R&D agreements may consist of nonrefundable up-front payments, milestone payments, royalties, and services. In addition, we may license our technology to third parties, which may or may not be part of an R&D agreement.

For agreements that contain multiple elements, each element is accounted for as a separate unit of accounting provided the following criteria are met: the delivered products or services have value to the customer on a stand-alone basis and, for an arrangement that includes a general right of return relative to the delivered products or services, delivery, or performance of the undelivered product or service is considered probable and is substantially controlled by us. We consider a deliverable to have stand-alone value if the product or service is sold separately by us or another vendor or could be resold by the customer. Our R&D agreements do not include a general right of return relative to the delivered products.

Nonrefundable up-front payments are deferred and recognized as revenue over the term of the R&D agreement. If an R&D agreement is terminated before the original term of the agreement is fulfilled, all remaining deferred revenue is recognized at termination.

Milestone payments represent amounts received from our R&D partners, the receipt of which is dependent upon the achievement of certain scientific, regulatory, or commercial milestones. We recognize milestone payments when the triggering event has occurred, there are no further contingencies or services to be provided with respect to that event, and the counterparty has no right to refund of the payment.

***Advertising Costs***

We expense advertising costs as incurred.

***Research and Development***

We recognize R&D expenses as incurred. These expenses consist of direct and research-related allocated overhead costs such as facilities and information technology costs, costs incurred in connection with collaborator-funded activities are expensed as incurred. Costs to acquire technologies that are utilized in R&D that have no alternative future use are expensed as incurred. We also expense all costs associated with the acquisition of grain, net of proceeds from seed sales, as R&D expense.

***Patents***

We expense patent costs, including related legal costs, as incurred. Costs to write, maintain, in-license, and defend patents are recorded as selling, general and administrative expenses in the statements of operations. Costs to support the research for filing patents are recorded as R&D expenses in the statements of operations.

***Stock-Based Compensation***

We generally measure employee and nonemployee stock-based awards at grant-date fair value and record compensation expense over the vesting period of the award. Stock-based awards issued to nonemployees are remeasured until the award vests. We use the Black-Scholes option pricing model to value our stock option awards.

The expected term of stock options is estimated using the average of the vesting tranches and the contractual life of each grant for employee options as we have limited historical information to develop reasonable expectations

about future exercise patterns and post-vesting employment termination behavior for our stock option grants. For options granted to nonemployees, we use the remaining contractual life. For stock price volatility, we use comparable public companies as a basis for its expected volatility to calculate the fair value of option grants. The risk-free interest rate is based on U.S. Treasury notes with a term approximating the expected term of the option. We assume no dividend yield because dividends are not expected to be paid in the near future, which is consistent with our history of not paying dividends.

We generally measure compensation expense for grants of restricted stock units using the value of a share of our stock on the date of grant. Compensation expense for grants of stock awards to non-employees are initially measured using the share price on date of grant and remeasured quarterly.

If an award is forfeited prior to vesting the associated reduction in expense is reflected net in stock compensation expense in the period the forfeiture occurred. Stock-based compensation expense is recorded in R&D and selling, general and administrative (SG&A) expenses in our statements of operations.

***Income Taxes***

Current income taxes are recorded based on statutory obligations for the current operating period for the jurisdictions in which we have operations.

Deferred taxes are provided on an asset and liability method, whereby deferred tax assets are recognized for deductible temporary differences and deferred tax liabilities are recognized for taxable temporary differences. Temporary differences are the differences between the reported amounts of assets and liabilities and their tax basis. Deferred tax assets are reduced by a valuation allowance when we believe it is more likely than not that some portion or all of the deferred tax assets will not be realized. Deferred tax assets and liabilities are adjusted for the effects of changes in tax laws and rates on the date of enactment.

***Foreign Currency Transactions***

Transactions in foreign currencies are translated at the exchange rates effective on the transaction dates. Assets and liabilities denominated in foreign currencies are translated at the period-end exchange rate. Foreign currency gains and losses are recognized in SG&A expenses in the statements of operations.

***Recently Adopted Accounting Pronouncements***

In the second quarter of 2017 we adopted new accounting requirements for the tax treatment and presentation of share-based payments in our income and cash flow statements. The impact of adoption was a $0.8 million tax benefit, however, due to the recognition of a full valuation allowance, the net impact was zero.

In the first quarter of 2018 we adopted new accounting requirements for when to account for a change to the terms or conditions of a share-based payment award as a modification. Its adoption did not have a material impact on our financial statements.

**2. FINANCIAL INSTRUMENTS, FAIR VALUE, AND CONCENTRATIONS OF CREDIT RISK**

The carrying values of cash and cash equivalents, restricted cash, due from related parties, accounts payable, due to related parties, and all other current liabilities approximate fair value. The fair value of our financing lease obligations, including the current portion, are $15.8 million as of December 31, 2018, and $14.2 million as of December 31, 2017. The carrying amounts of our financing lease obligations, including the current portion, were $18.5 million as of December 31, 2018 and $10.1 million as of December 31, 2017. The fair value of our financing lease obligations was determined using discounted cash flow analysis based on market rates for similar types of borrowings. Financing lease obligations are a Level 2 liability in the fair value hierarchy.

***Fair Value Measurements and Financial Statement Presentation***

The fair values of our assets, liabilities, and derivative positions recorded at fair value and their respective levels in the fair value hierarchy as of December 31, 2018 and December 31, 2017, were as follows:

| | December 31, 2018 | | | | December 31, 2018 | | | |
|---|---|---|---|---|---|---|---|---|
| | Fair Values of Assets | | | | Fair Values of Liabilities | | | |
| **In Thousands** | **Level 1** | **Level 2** | **Level 3** | **Total** | **Level 1** | **Level 2** | **Level 3** | **Total** |
| Other items reported at fair value: | | | | | | | | |
| Forward Purchase Contracts (a) | $ - | $ 1 | $ - | $ 1 | $ - | $ 248 | $ - | $ 248 |
| **Total** | **$ -** | **$ 1** | **$ -** | **$ 1** | **$ -** | **$ -** | **$ -** | **$ -** |

(a) The fair value for forward purchase contracts is estimated based on commodity futures market prices.

| | December 31, 2017 | | | | December 31, 2017 | | | |
|---|---|---|---|---|---|---|---|---|
| | Fair Values of Assets | | | | Fair Values of Liabilities | | | |
| **In Thousands** | **Level 1** | **Level 2** | **Level 3** | **Total** | **Level 1** | **Level 2** | **Level 3** | **Total** |
| Other items reported at fair value: | | | | | | | | |
| Forward Purchase Contracts (a) | $ - | $ 3 | $ - | $ 3 | $ - | $ 4 | $ - | $ 4 |
| **Total** | **$ -** | **$ 3** | **$ -** | **$ 3** | **$ -** | **$ -** | **$ -** | **$ -** |

(a) The fair value for forward purchase contracts is estimated based on commodity market future prices.

***Commodity Price Risk***

We enter into purchase agreements for grain with settlement values based on commodity futures market prices. These agreements allow our counterparty to fix their sale prices to us at various times as defined in the contract. Any realized and unrealized gains and losses from these contracts have been recorded as R&D expenses because we had yet to commercialize the associated product. The fair market value for these contracts is estimated based on commodity futures market prices.

***Foreign Exchange Risk***

Foreign currency fluctuations affect our foreign currency cash flows related to payments to our Cellectis and third-party purchases. Our principal exposure is to the euro. We do not currently hedge these exposures, and do not believe that the current level of foreign currency risk is significant to our operations.

***Concentrations of Credit Risk***

We invest our cash, cash equivalents, and restricted cash in short-term highly liquid investments and hold deposits at financial institutions that may exceed insured limits. We evaluate the credit worthiness of these institutions in determining the risk associated with these deposits. We have not experienced any losses on these deposits.

We also have receivables from sales of seed. In the event we are not able to collect proceeds from the sale of seed, our recourse is to deduct that amount from our payment for the grain from that counterparty. We have not experienced any losses on seed sales.

**3. RELATED-PARTY TRANSACTIONS**

We have several agreements that govern our relationship with Cellectis. We also pay management fees for services they provide, primarily information technology, legal, human resources, finance and accounting, and communications. We perform the Cellectis' U.S. operations payroll services. We record nearly all of the management fees in general and administrative expense in our statement of operations. We incurred management fee expenses of $2.3 million in 2018, $2.0 million in 2017, and $3.2 million in 2016.

The Cellectis also has guaranteed our headquarters lease agreement as described in Note 8. Cellectis' guarantee of our obligations under the sale-leaseback transaction will terminate at the end of the second consecutive calendar year in which our tangible net worth exceeds $300 million. We also license our technology from the Cellectis and owe them royalties on any revenue we generate from sales of product as well as a percentage of any sublicense revenues we generate. Any amounts borrowed from the Cellectis bear floating-rate interest specified in the agreements.

During the year ended December 31, 2018, Cellectis purchased 550,000 shares of common stock in our follow-on offering at the public offering price of $15.00 per share. In addition, in connection with the vesting on June 14, 2018, of restricted stock units for certain of our and Cellectis' employees and nonemployees, Cellectis purchased 63,175 shares of our common stock at a price of $19.49 per share (the closing price reported on the NASDAQ Global Market on June 14, 2018) directly from such employees and nonemployees in private transactions pursuant to share purchase agreements dated June 13, 2018.

TALEN technology was invented by researchers at the University of Minnesota and Iowa State University and exclusively licensed to Cellectis. We obtained from Cellectis an exclusive license for the TALEN technology for commercial use in plants. TALEN technology is the primary gene-editing technology used by us today. We have not paid any royalties to date for this license because we had not yet commercialized a product.

**4. STOCKHOLDERS' EQUITY**

Preferred stock of 50.0 million shares, with a $0.0001 par value, is authorized but unissued.

***Initial Public Offering***
On July 25, 2017, we completed an IPO of our common stock, in which we sold an aggregate of 8,050,000 shares of our common stock at a price of $8.00 per share, including 1,050,000 shares of common stock pursuant to the exercise of the underwriters' option to purchase additional shares. In the aggregate, we received net proceeds from the IPO and exercise of the overallotment of approximately $58.0 million, after deducting underwriting discounts and commissions of $3.1 million and offering expenses totaling approximately $3.3 million. As part of the IPO, Cellectis purchased 2,500,000 shares of our common stock for a value of $20.0 million, which is included in the net proceeds of approximately $58.0 million. We used $5.7 million of the proceeds from Cellectis to pay a portion of our outstanding obligations to Cellectis.

***Follow-on Public Offering***
On May 22, 2018, we completed a follow-on offering of our common stock. We sold an aggregate of 4,057,500 shares of common stock at a price of $15.00 per share, including 457,500 shares of common stock pursuant to the exercise of the underwriters' option to purchase additional shares. In the aggregate, we received net proceeds from the follow-on offering and exercise of the overallotment option of approximately $57.0 million, after deducting underwriting discounts and commissions of $3.2 million and offering expenses totaling approximately $0.7 million. As part of the follow-on offering, Cellectis purchased 550,000 shares of common stock for a value of $8.3 million, the proceeds of which are included in the net proceeds of approximately $57.0 million.

***Stock Splits***
On June 14, 2017, we effected a stock split of our common stock at a ratio of 100-for-1 and increased the number of shares of common stock authorized for issuance to 30,000,000 by filing a Certificate of Amendment with the Secretary of State of the State of Delaware.

On July 25, 2017, we increased our authorized capital stock to 325,000,000 shares of which 275,000,000 shares are designated common stock, par value $0.0001, and 50,000,000 shares are designated preferred stock, par value $0.0001.

On July 25, 2017, concurrently with the closing of the IPO, we effected a stock split of our common stock at a ratio of 2.45-for-1. As a result of the stock split, each share of issued and outstanding common stock was converted into 2.45 shares of issued and outstanding common stock without changing the par value per share.

Since the par value of the common stock remained at $0.0001 per share subsequent to each stock split, the value of common stock recorded to our balance sheets has been retroactively increased to reflect the par value of the increased number of outstanding shares, with a corresponding decrease to additional paid-in capital. All share and per share data for periods occurring prior to the stock split that are included in the financial statements and related notes have been retroactively restated to reflect the stock splits.

We repurchased $0.2 million of common stock in 2018.

**5. NET LOSS PER SHARE**

Basic and diluted loss per share were calculated using the following:

All outstanding stock options and restricted stock units are excluded from the calculation since they are anti-dilutive.

| | Year ended December 31, | | |
|---|---|---|---|
| **In Thousands, Except Share Data and Per Share Amounts** | **2018** | **2017** | **2016** |
| Net loss | **$ (27,897)** | $ (25,980) | $ (12,086) |
| Average number of common shares—basic and diluted EPS | **30,683,421** | 23,153,661 | 19,600,000 |
| Loss per share—basic and diluted | **$ (0.91)** | $ (1.12) | $ (0.62) |

| | Year ended December 31, | | |
|---|---|---|---|
| | **2018** | **2017** | **2016** |
| Anti-dilutive stock options and restricted stock units | **4,253,301** | 5,257,365 | 1,930,600 |

We have not used the treasury method in determining the number of anti-dilutive stock options and restricted stock units in the table above.

**6. STOCK-BASED COMPENSATION**

We use broad-based stock plans to attract and retain highly qualified officers and employees and to help ensure that management's interests are aligned with those of our shareholders. We have also granted equity-based awards to nonemployees and certain employees of Cellectis.

In December 2014, we adopted the Calyxt, Inc. Equity Incentive Plan (the 2014 Plan), which allows for the grant of stock options, and in June 2017, we adopted the 2017 Omnibus Plan (the 2017 Plan).

As of December 31, 2018, 1,074,273 shares were registered and available for grant under approved registration statements, while 2,696,680 shares were available for grant in the form of stock options, restricted stock, and restricted stock units under the 2017 Plan. Stock-based awards now outstanding also include some granted under the 2014 Plan, under which no further awards will be granted.

***Stock Options***

The estimated fair values of stock options granted and the assumptions used for the Black-Scholes option pricing model were as follows:

| | 2018 | 2017 | 2016 |
|---|---|---|---|
| Estimated fair values of stock options granted | **$ 9.09** | $ 2.42 | $ 5.03 |
| Assumptions: | | | |
| Risk-free interest rate | **2.2% - 3.0%** | 1.3% - 2.4% | 0.6% |
| Expected volatility | **40.9% - 57.2%** | 27.4% - 45.1% | 30.0% |
| Expected term (in years) | **5.6 - 10 years** | 1.2 - 10 years | 5.8 - 6.2 years |

We estimate the fair value of each option on the grant date or other measurement date if applicable using a Black-Scholes option-pricing model, which requires us to make predictive assumptions regarding future stock price volatility, employee exercise behavior and dividend yield. We estimate our future stock price volatility using the historical volatility of comparable public companies over the expected term of the option. Our expected term represents the period of time that options granted are expected to be outstanding determined using the simplified or lattice methods. The risk-free interest rate for periods during the expected term of the options is based on the U.S. Treasury zero-coupon yield curve in effect at the time of grant. We have not nor do we expect to pay dividends for the foreseeable future.

Options may be priced at 100 percent or more of the fair market value on the date of grant, and generally vest over six years after the date of grant. Options generally expire within 10 years after the date of grant.

Information on stock option activity follows:

| | Options Exercisable | Weighted-Average Exercise Price Per Share | Options Outstanding | Weighted-Average Exercise Price Per Share |
|---|---|---|---|---|
| Balance as of December 31, 2016 | - | $ - | 1,930,600 | $ 4.45 |
| Granted | | | 2,120,347 | 13.29 |
| Exercised | | | (68,780) | 3.95 |
| Forfeited or expired | | | (98,735) | 1.23 |
| Balance as of December 31, 2017 | 1,244,968 | $ 5.20 | 3,883,432 | 9.16 |
| Granted | | | 554,243 | 16.69 |
| Exercised | | | (592,342) | 4.43 |
| Forfeited or expired | | | (643,446) | 12.52 |
| **Balance as of December 31, 2018** | **1,278,038** | **$ 7.45** | **3,201,887** | **$ 10.67** |

Stock-based compensation expense related to stock option awards was $4.4 million in 2018, $11.7 million in 2017, and zero in 2016. The options granted under the plans were originally only exercisable upon a triggering event or initial public offering as defined by the plans. When we completed our IPO on July 25, 2017, we recognized compensation expense of $5.6 million. In December 2017, an employee's stock options were modified in connection with the employee's termination to provide for continued vesting through the end of 2018. We recognized incremental stock-based compensation expense of $0.7 million related to this modification.

The aggregate intrinsic value of options outstanding and exercisable at December 31, 2018, was $5.9 million and the weighted average remaining contractual term was 7.6 years as of that date.

Net cash proceeds from the exercise of stock options less shares used for minimum withholding taxes and the intrinsic value of options exercised were as follows:

| | Year ended December 31, | | |
|---|---|---|---|
| **In Thousands** | **2018** | **2017** | **2016** |
| Net cash proceeds | **$ 2,622** | $ 265 | $ - |
| Intrinsic value of options exercised | **$ 7,569** | $ 1,347 | $ - |

***Restricted Stock Units***

Units settled in stock subject to a restricted period may be granted to key employees under the 2017 Plan. Restricted stock units generally vest and become unrestricted over five years after the date of grant.

Information on restricted stock unit activity follows:

| | **Number of Restricted Stock Units Outstanding** | **Weighted-Average Grant Date Fair Value** |
|---|---|---|
| Unvested balance at December 31, 2017 | 1,373,933 | $ 8.00 |
| Granted | 315,825 | 16.76 |
| Vested | (261,507) | 9.89 |
| Cancelled | (376,837) | 10.72 |
| **Unvested balance at December 31, 2018** | **1,051,414** | **$ 10.15** |

| | Year ended December 31, | | |
|---|---|---|---|
| | **2018** | **2017** | **2016** |
| Weighted average price per unit | **$ 16.76** | $ 8.00 | $ - |

The total grant-date fair value of restricted stock unit awards that vested was $2.7 million in 2018 and $0.3 million in 2017.

As of December 31, 2018, unrecognized compensation expense related to non-vested stock options and restricted stock units was $9.9 million. This expense will be recognized over 50 months on average for stock options and over 47 months on average for restricted stock units, assuming no change in the remeasurement value of grants made to non-employees in this calculation.

We treat stock-based compensation awards granted to employees of the Cellectis as deemed dividends. We recorded deemed dividends of $2.3 million in 2018, $3.6 million in 2017, and zero in 2016.

***Cellectis Equity Incentive Plan***

Prior to 2018 Cellectis granted stock options to our employees. Compensation costs related to these grants have been recognized in the statements of operations with a corresponding credit to stockholders' equity, representing the Cellectis' capital contribution to us. The fair value of each stock option was estimated at the grant date using the Black-Scholes option pricing model and were valued at $17.16 per share for grants made in 2017. No grants were made under this plan in 2016.

We recognized stock-based compensation expense related to our Cellectis' grants of $0.1 million in 2018, $0.4 million in 2017, and $0.9 million in 2016.

**7. INCOME TAXES**

The following table reconciles the United States statutory income tax rate with our effective income tax rate:

| | Year ended December 31, | | |
|---|---|---|---|
| | **2018** | **2017** | **2016** |
| United States statutory rate | **21.0%** | 34.0% | 34.0% |
| State and local income taxes, net of federal tax benefits | **0.7%** | -% | -% |
| Stock-based compensation | **3.6%** | 0.6% | (1.2%) |
| Deferred rate change | **0.3%** | (12.9%) | 0.0% |
| R&D credit | **0.7%** | -% | 3.5% |
| Other | **0.7%** | -% | -% |
| Change in valuation allowance | **(27.0%)** | (21.7%) | (35.2%) |
| Effective income tax rate | **-%** | -% | -% |

Deferred assets and liabilities consist of the following:

| | December 31, | |
|---|---|---|
| **In Thousands** | **2018** | **2017** |
| Net operating losses | **$ 16,372** | $ 9,252 |
| Stock-based compensation | **2,747** | 2,691 |
| Financing lease obligations | **4,009** | 2,131 |
| Tax credit carry forwards | **922** | 735 |
| Compensation and employee benefits | **474** | 576 |
| Other | **116** | 8 |
| Gross deferred tax assets | **24,640** | 15,393 |
| Less valuation allowance | **(20,329)** | (12,792) |
| Net deferred tax assets | **4,311** | 2,601 |
| Fixed assets | **(4,352)** | (2,600) |
| Other | **41** | (1) |
| Gross deferred tax liabilities | **(4,311)** | (2,601) |
| Net deferred tax asset or liability | **$ -** | $ - |

We have established a valuation allowance against our deferred tax assets described above as current evidence does not suggest we will realize sufficient taxable income of the appropriate character within the carryforward period to allow us to realize these deferred tax benefits.

We have $85.5 million of tax loss carryforwards. Of this amount, $12.0 million is state operating loss carryforwards, and $73.5 million is federal operating loss carryforwards. The federal carryforward periods are as follows: $31.6 million do not expire; zero expire in 2019 and 2020; and $41.9 million expire in 2032 and beyond. The state carryforward period is 20 years.

On December 22, 2017, the TCJA was signed into law. The TCJA results in significant revisions to the U.S. corporate income tax system, including a reduction in the U.S. corporate income tax rate, implementation of a territorial system, and a one-time deemed repatriation tax on untaxed foreign earnings. The TCJA also results in a U.S. federal blended statutory rate of 21.0% percent for us in 2018. We have completed the accounting for the income tax effects of the TCJA as of December 31, 2018.

We are subject to federal income taxes in the United States as well as various state and local jurisdictions. A number of years may elapse before an uncertain tax position is audited and finally resolved. While it is often difficult to predict the final outcome or the timing of resolution of any particular uncertain tax position, we do not believe that we need to recognize any liabilities for uncertain tax positions at December 31, 2018.

The number of years with open tax audits varies depending on the tax jurisdiction. Our major taxing jurisdictions are the United States, both federal and state. Various tax examinations by United States state taxing authorities could be conducted for any open tax year, which vary by jurisdiction, but are generally from 3 to 5 years.

**8. LEASES, OTHER COMMITMENTS, AND CONTINGENCIES**

***Litigation and Claims***

In December 2013, the Company entered into a Research and Commercial License Agreement (the License Agreement) with a subsidiary of Bayer Aktiengesellschaft (Bayer), pursuant to which we granted Bayer a license to certain patents for the research and commercialization of certain products developed with the Company's TALEN technology. The Company believed that Bayer breached the License Agreement by filing patent applications in violation of the License Agreement's provisions and by failing to make a payment due under the License Agreement. Accordingly, the Company gave notice to Bayer of its termination of the License Agreement, and on March 12, 2018, the Company filed a complaint in Delaware Chancery Court alleging that it properly terminated the License Agreement for Bayer's material breach.

On May 15, 2018, Bayer agreed to settle the lawsuit that the Company brought. Under the settlement terms, the parties agreed that the License Agreement is terminated, that Bayer will destroy any technology, related product and confidential information covered by the License Agreement, and that Bayer will permanently abandon patent applications that are based on or include data related to the covered technology. This settlement confirms that Bayer and its subsidiaries have no access to our technology or intellectual property. The settlement was filed in Delaware Chancery Court on May 15, 2018.

We are not a party to any other material pending legal proceeding.

***Leases***

We lease our headquarters facility, office equipment, and other items. Our headquarters lease involved the sale of land and improvements to a third party who then constructed the facility. The lease term is twenty years and we hold four five-year options to extend the lease.

Rent expense from all operating leases was $0.2 million in 2018, $0.3 million in 2017, and $0.3 million in 2016.

***Sale-Leaseback of Headquarters and Lab Facility***

In September 2017 we consummated a sale-leaseback transaction with a third party for our corporate headquarters and lab facility. The facility is composed of a 40,000 square-foot office and lab building, with greenhouses and outdoor research plots. We are deemed the owner for accounting purposes. The lease has a term of twenty years, with four options to extend its term for five years each, subject to there being no default under the lease terms beyond any cure period and us occupying the property at the time of extension. In 2017, we received $7 million in connection with the sale of the land and uncompleted facility in 2017.

We obtained a temporary certificate of occupancy in May 2018 and the lease commenced. Under the lease, we pay an annual base rent of eight percent of the total project cost with scheduled increases in rent of 7.5 percent on the sixth, eleventh and sixteenth anniversaries of the start of the lease commencement as well as on the first day of each renewal term. Currently, we pay an annual base rent of approximately $1.4 million. We are also responsible for all operating costs and expenses associated with the property. Beginning on the eighteenth month anniversary of the start of the lease, if the landlord decides to sell the property, we have a right of first refusal to purchase the property on the same terms offered to any third party.

Concurrent with our entering into the lease, Cellectis guaranteed all of our obligations. Cellectis' guarantee of our obligations will terminate at the end of the second consecutive calendar year in which our tangible net worth exceeds $300 million, as determined in accordance with generally accepted accounting principles. At a point when Cellectis owns 50 percent or less of our outstanding common stock, we have agreed to indemnify Cellectis for any obligations incurred by Cellectis under its guarantee of our obligations under the lease.

***Sale-Leaseback of Equipment***
In December 2018 we consummated a sale-leaseback transaction with a third party to finance equipment. The lease has a term of four years and we may add up to $1.1 million of future equipment purchases to the financing agreement. We were required to deposit cash into a restricted account in an amount equal to the future rent payments required by the lease. At December 31, 2018 this restricted cash totaled $1.4 million.

Noncancelable future lease commitments are as follows:

| In Thousands | Operating Leases | Capital Leases |
|---|---|---|
| 2019 | $ 47 | $ 1,715 |
| 2020 | 76 | 1,715 |
| 2021 | 36 | 1,685 |
| 2022 | 31 | 1,659 |
| 2023 | - | 1,445 |
| After fiscal 2023 | - | 22,908 |
| **Total noncancelable future lease commitments** | **$ 190** | **$31,127** |

***Other Commitments***
As of December 31, 2018, we have committed to purchase grain from farmers at dates throughout 2019 and 2020 aggregating $12.4 million using commodity futures market prices and expected yields per acre. This amount is not recorded in the financial statements because we have not taken delivery of the grain as of that date.

**9. EMPLOYEE BENEFIT PLAN**

We provide a 401(k) defined contribution plan for all regular full-time employees who have completed three months of service. We match employee contributions up to certain amounts and those matching contributions vest immediately. Our expense was $0.1 million in 2018, 2017, and 2016.

**10. SUPPLEMENTAL INFORMATION**

The components of certain balance sheet accounts are as follows:

| In Thousands | December 31, 2018 | 2017 |
|---|---|---|
| Prepaid expenses and other current assets: | | |
| Prepaid expenses | **$ 893** | $ 261 |
| Prepaid rent | **40** | 86 |
| R&D tax credit receivable | **301** | 141 |
| Forward purchase contracts | **1** | 3 |
| Other | **66** | 135 |
| Total | **$1,301** | $ 626 |

| In Thousands | December 31, 2018 | 2017 |
|---|---|---|
| Land, buildings, and equipment: | | |
| Land under capital lease | **$ 5,690** | $ 5,690 |
| Buildings | **642** | 642 |
| Buildings under capital lease | **3,812** | 3,772 |
| Leasehold improvements | **52** | 169 |
| Leasehold improvements under capital lease | **10,023** | 0 |
| Office furniture and equipment | **1,789** | 1,672 |
| Office furniture and equipment under capital lease | **1,374** | 0 |
| Computer equipment and software | **2** | 20 |
| Construction in progress | **554** | 3,671 |
| Total land, buildings, and equipment | **23,938** | 15,636 |
| Less accumulated depreciation | **(2,088)** | (1,283) |
| Total | **$ 21,850** | $14,353 |

| In Thousands | December 31, 2018 | 2017 |
|---|---|---|
| Other non-current assets: | | |
| R&D tax credit receivable | **$ 250** | $ 233 |
| Other | **56** | 124 |
| Total | **$ 306** | $ 357 |

| In Thousands | December 31, 2018 | 2017 |
|---|---|---|
| Other current liabilities: | | |
| Forward purchase contracts | **$ 248** | $ 4 |
| Purchase commitments | **407** | - |
| Other | **56** | 483 |
| Total | **$ 711** | $ 487 |

Certain statements of operations amounts are as follows:

| In Thousands | Year Ended December 31, 2018 | 2017 | 2016 |
|---|---|---|---|
| Research and development | **$ 629** | $ 6,086 | $ 928 |
| Selling, general and administrative | **3,756** | 6,005 | 20 |
| Stock compensation expense | **$ 4,385** | $ 12,091 | $ 948 |

| In Thousands | Year Ended December 31, 2018 | 2017 | 2016 |
|---|---|---|---|
| Interest expense | **$ (1,257)** | $ (261) | $ (5) |
| Interest income | **1,521** | 260 | - |
| Interest, net | **$ 264** | $ (1) | $ (5) |

| In Thousands | Year Ended December 31, 2018 | 2017 | 2016 |
|---|---|---|---|
| Depreciation expense, including amortization of assets under capital lease | **$ 1,081** | $ 551 | $ 345 |

Certain statements of cash flows amounts are as follows:

| In Thousands | Year Ended December 31, 2018 | 2017 | 2016 |
|---|---|---|---|
| Cash, cash equivalents and restricted cash: | | | |
| Cash and cash equivalents | **$ 93,794** | $ 56,664 | $ 5,026 |
| Restricted cash, current | **381** | - | - |
| Non-current restricted cash | **1,113** | - | - |
| Total | **$ 95,288** | $ 56,664 | $ 5,026 |

| In Thousands | Year Ended December 31, 2018 | 2017 | 2016 |
|---|---|---|---|
| Interest Paid | **$ 1,086** | $ 200 | $ 5 |
| Non-cash additions to land, buildings and equipment | **$ 7,994** | $ 3,130 | $ - |

**11. QUARTERLY FINANCIAL DATA (UNAUDITED)**

The following table sets forth certain unaudited quarterly financial data for the eight quarters ended December 31, 2018. The unaudited information set forth below has been prepared on the same basis as the audited information contained herein and includes all adjustments necessary to present fairly the information set forth. The operating results for any quarter are not indicative of results for any future period. All data is in thousands except per share data.

| | 2018 | | | | 2017 | | | |
|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Revenue | **$ 11** | **$ 196** | **$ 27** | **$ 2** | $ 55 | $ 223 | $ 44 | $ 186 |
| Operating expenses | **$(4,307)** | **$(7,688)** | **$(7,726)** | **$(8,630)** | $(2,844) | $(3,463) | $ (12,991) | $ (6,999) |
| Net loss | **$(4,370)** | **$(7,576)** | **$(7,483)** | **$(8,468)** | $(2,832) | $(3,395) | $ (12,904) | $ (6,849) |
| Net loss per share | **$ (0.16)** | **$ (0.25)** | **$ (0.23)** | **$ (0.27)** | $ (0.14) | $ (0.17) | $ (0.51) | $ (0.30) |

January 11, 2019

Dear Ms. Frimerman,

On behalf of Calyxt, Inc., (the "Company"), I am pleased to offer you a position with the Company as General Counsel. This offer letter agreement (this "Letter") sets forth the terms of your offer which, if you accept, will govern your employment with the Company.

1. Certain Definitions. Certain words or phrases used in this Letter with initial capital letters will have the meanings set forth in paragraph 9 hereof.

2. Employment. If you accept the terms of this Letter by January 21, 2019, the Company will employ you beginning on February 11, 2019 (the "Effective Date") at the latest, upon the terms and conditions set forth in this Letter, and ending as provided in paragraph 6 hereof. Notwithstanding anything in this Letter to the contrary, you will be an at-will employee of the Company and you or the Company may terminate your employment with the Company for any reason or no reason at any time. The period during which you are employed by the Company is referred to in this Letter as the "Employment Term."

3. Position and Duties. You shall serve as General Counsel of the Company and shall have the duties, responsibilities and authority consistent with an executive serving in such position, subject to the Company's sole right to expand or reduce such duties, responsibilities and authority, either generally or in specific instances. You shall devote your full-time business time and attention to the performance of your duties under this Letter and will not engage in any other business activities or serve on boards of directors or similar bodies of other organizations without the prior consent of the Company's Board of Directors. Notwithstanding the foregoing, you will be permitted to (a) purchase and own less than five percent (5%) of the publicly-traded securities of any corporation, provided that such ownership represents a passive investment and that you are not a controlling person of, or a member of a group that controls such corporation, and provided further that this ownership does not interfere with the performance of your duties and responsibilities to the Company, including but not limited to the duties and responsibilities set forth in this Section 3. You will report to the Chief Executive Officer of the Company.

4. Place of Employment.

The principal place of your employment will be the Company's office in Roseville, Minnesota, except that you may be required to travel on Company business during your employment.

5. Compensation and Benefits.

a. Salary. The Company shall pay you an annualized salary of $275,000 (the "Base Salary") during the Employment Period in periodic installment in accordance with the Company's payroll practices as may be in effect from time to time, but not less frequently than monthly. Your Base Salary will be subject to review at least annually by the Board and the Board may, but will not be required to, increase your Base Salary during the Employment Term.

b. Cash Sign-On Bonus.

i. In consideration of your foregone compensation at your previous employer, the Company will give you a one-time Cash Sign-On Bonus in the amount of one hundred thousand dollars ($100,000), minus all appropriate deductions for local, state, federal and payroll tax withholdings. This Bonus will be payable thirty (30) days of the Effective Date.

ii. The Cash Sign-On Cash Bonus will be vested in the amount of 50% on the date of payment, an additional 25% on the first anniversary of the date of payment, and 25% on the second anniversary of the payment.

iii. If you voluntarily terminate your employment with the Company or your employment is terminated by the Company for Cause one (1) year after the Effective Date, you agree to repay the entire unvested gross amount of the Cash Sign-On Bonus to the Company. If you voluntarily terminate your employment with the Company or your employment is terminated by the Company for Cause before the first anniversary of the Effective Date, you agree to repay the entire gross amount of the Cash Sign-On Bonus to the Company. The reimbursement will be made by certified or bank check no later than thirty (30) days following your Termination Date. In the event of a repayment, the Company will make appropriate adjustments to your tax withholdings, reflecting the fact of said repayment.

c. Annual Performance Bonus. For each calendar year of the Employment Term, you will be eligible to receive an annual performance bonus ("Annual Performance Bonus") from the Company, with an amount of such bonus equal up to forty percent (40%) of your Base Salary and a multiplier on Annual Target of 0.7 to 1.5x. You are eligible to earn a prorated Annual Performance Bonus for your individual contribution and the Company's performance between the Effective Date and December 31, 2019. Your Annual Performance Bonus will be based on achievement of individual and/or Company performance goals that are established by the Board in its sole discretion at the beginning of each calendar year. Following the close of each calendar year, the Board shall determine whether you have earned an Annual Performance Bonus, and the amount of any such bonus, based on the goals established at the beginning of the year. Payment of the Annual Performance Bonus is expressly conditioned upon your employment with the Company on the date the Annual Performance Bonus is paid, except as provided in paragraph 6(e) below and as provided in paragraph 6(d) in case of Termination Without Cause (as defined in paragraph 9) and conditions detailed in paragraph 7. The Annual Performance Bonus will be paid within seventy-five (75) days after the end of the calendar year to which it relates. Your target Annual Performance Bonus will be subject to periodic review and adjustment by the Board, in its sole discretion, from time to time.

d. Equity Award.

e. Not later than thirty days after the Effective Date, subject to the Board approval, you will be granted a stock option (the "Option") to purchase up to 100,000 shares of the Company's Common Stock, pursuant to the Company's Stock Incentive Plan (the "Plan").

f. You will be eligible to participate in and receive additional stock option or equity award grants under the Company's current and future equity incentive plans from time to time in the sole discretion of the Board, and in accordance with the terms and conditions of such plans.

g. Executive Benefits Package. You will be entitled during your employment to participate in the Company's Executive Benefits Package. The Company's "Executive Benefits Package" means those benefits (including benefits for which substantially all of the employees of the Company are from time to time generally eligible), as determined from time to time by the Company's Board of Directors (the "Board"). The Company reserves the right to amend or cancel any employee benefit plans, programs, or practices at any time in its sole discretion, subject to the terms of the employee benefit plan and applicable law.

h. Vacation. During the Employment Period, you will be entitled to take paid vacation pursuant to the Company's existing policies regarding paid vacations. You will be entitled to accrue twenty (20) days of paid vacation per calendar year. Beginning on the Effective Date, your vacation time will accrue on a monthly basis at a rate of 1.67 days per month. Vacation time that is not used by you in the calendar year it accrues may be carried over to the next calendar year, but you will cease to accrue additional vacation time beyond your annual accrual (i.e., 20 days) in any calendar year until you have taken vacation and your accrued vacation time has dropped below the maximum annual accrual of 20 days.

6. Termination Events.

Your employment with the Company will continue until terminated upon the occurrence of any of the following events:

a. Your death;

b. Your Permanent Disability;

c. Your written notice of your termination of your employment to the CEO;

d. The termination of your employment by the Company at any time Without Cause (as defined in paragraph 9) with the termination to take effect as determined by the Company; or

e. The termination of your employment by the Company For Cause (as defined in paragraph 9), with the termination to take effect immediately upon written notice by the Company to the Employee or upon a date determined by the Company.

7. Consequences of Termination.

a. Compensation upon Termination by Company—For Cause. Upon the termination of your employment For Cause, you will cease to have any rights to Base Salary, bonus awards, expense reimbursements, fringe benefits or any other compensation or benefits of any nature, except that you will be entitled to receive any Base Salary that has accrued but is unpaid, any reimbursable expenses that have been incurred but are unpaid as of your Termination Date, which will be paid in accordance with Company's usual payroll procedures (collectively, the "Accrued Amounts").

b. Compensation upon Termination by Company—Not For Cause.

c. Upon the termination Without Cause of your employment provided for in paragraph 6(d), you will cease to have any rights to Base Salary, bonus awards, expense reimbursements, fringe benefits or any other compensation or benefits of any nature, except that you will be entitled to receive the Accrued Amounts, Annual Performance Bonus on a prorata temporis basis.

d. So long as you are complying with the non-compete and other applicable obligations set forth in this agreement, the Company shall continue to pay you Severance Pay in an amount equal to twelve (12) months of Base Salary at a rate in effect on the date of termination, reduced by any required federal, state and local taxes and any other applicable withholdings or deductions, with the Company's payment of such salary continuation payable in periodic installments in accordance with the Company payroll practices. You agree and acknowledge that the Company may condition the receipt of any Severance Pay due to you pursuant to this paragraph upon: (i) you entering into a full release of claims in favor of the Company, its affiliates and subsidiaries and their respective officers and directors and separation agreement in such form as to be provided by the Company and (ii) such general release becomes effective within twenty-one (21) business days after the day it is provided to you for execution, and is not thereafter revoked by you, and provided further that you comply with all terms and conditions of this separation agreement, you will receive the benefit to which you are entitled. In the event the Company invokes its non-compete option as provided for in paragraph 8(b), your severance payment will end and the other terms and conditions of this separation agreement will continue.

e. Compensation upon Termination—By You. Upon your voluntary termination of your employment provided for in paragraph 6(c), you will cease to have any rights to Base Salary, bonus awards, expense reimbursements, fringe benefits or any other compensation or benefits of any nature, except that you will be entitled to receive the Accrued Amounts.

f. Compensation Upon Termination—Death or Permanent Disability. In the event your employment is terminated because of death or Permanent Disability, you will cease to have any rights to Base Salary, bonus awards, expense reimbursements, fringe benefits or any other compensation or benefits of any nature, except that you will be entitled to receive the Accrued Amounts, Annual Performance Bonus on a prorata temporis basis and participate in Company insurance plans pursuant to the terms and conditions thereof. In the event your employment is terminated as a result of your death, your spouse or, if you are not married at the time of your death, your estate will be entitled to the Accrued Amounts.

8. Competitive Activity; Confidentiality; Non-Solicitation; Discoveries and Inventions; Works Made for Hire.

a. Acknowledgements and Agreements. You hereby acknowledge and agree that in the performance of your duties to the Company, you will be brought into frequent contact with existing Customers and Potential Customers of the Company throughout the world. You agree that trade secrets and confidential information of the Company, more fully described in subparagraph 8(e)(i), gained by you during your association with the Company, have been developed by the Company through substantial expenditures of time, effort and money and constitute valuable and unique property of the Company. You further understand and agree that the foregoing makes it necessary for the protection of the Company's Business that you do not compete with the Company during your employment with the Company and that you do not compete with the Company for a reasonable period thereafter, as further provided in the following subparagraphs.

b. Competitive Activity.

i. While employed by the Company, and for a period of one (1) year following your Termination Date, you are obligated to provide notice to Calyxt of future activity and responsibilities (as provided for in subparagraph 8(b)(ii)) prior to starting a new position. Upon receipt of such notice, the Company will have a 10-day window to exercise a non-compete for a period not to exceed 12 months from the Termination Date.

ii. In the event (i) you are terminated without cause by the Company, (ii) the Company is paying a severance payment to you, and (iii) the Company invokes its non-compete option, your severance payments will end and the non-compete payment will begin for a period not to exceed one year from Termination Date, according to the Company payroll schedule less applicable withholdings. In the event you breach this clause, you agree to reimburse immediately all severance and non-compete payments you received from the Company.

iii. You agree and understand that should the Company exercise its non-compete option under this subparagraph, you will be bound by the terms of this Competitive Activity/non-compete provision, even if you are terminated for cause or you voluntary terminate, and thus do not receive the non-compete payments described herein.

iv. Direct or Indirect Competition. For the purpose of subparagraph 8(b)(i) but without limitation thereof, you will be in violation thereof if you engage in any or all of the activities set forth therein directly as an individual on your own account, or indirectly as a partner, joint venturer, employee, agent, salesperson, consultant, officer and/or director of any firm, association, partnership, corporation or other entity, or as a stockholder of any corporation in which you or your spouse, child or parent owns, directly or indirectly, individually or in the aggregate, more than five percent of the outstanding stock.

v. If it is judicially determined that you have violated subparagraph 8(b)(i), then the period applicable to each obligation that you have been determined to have violated will automatically be extended from the date of judicial determination by a period of time equal in length to the period during which such violation(s) occurred.

c. The Company. For purposes of this subparagraph 8(c), the Company will include any and all direct and indirect subsidiary, parent, affiliated, or related companies of the Company for which you worked or had responsibility at the time of termination of your employment and at any time during the two-year period prior to such termination.

d. Non-Solicitation.

i. Of Customers. You will not, directly or indirectly, at any time during the period of your employment or for a period of twenty-four (24) months following your Termination Date solicit, divert, or take away or supervise any other person, firm, or other entity in soliciting, diverting, or taking away any Customer or Prospective Customer of the Company for the purpose of selling, performing or providing Business Services to that Customer or Prospective Customer.

ii. Of Employees. You will not, directly or indirectly, at any time during the period of your employment or for a period of twenty-four (24) months following your Termination Date solicit, hire, employ, engage, affiliate with for profit, retain (or assist any other person or entity in soliciting, hiring, employing, engaging, affiliating for profit or retaining) any person who was a Company employee or consultant or independent contractor at any time during the one (1)-year period prior to your soliciting, hiring, employing, engaging, affiliating for profit or retaining, whether for your benefit or the benefit of any other person or organization other than the Company, or solicit, induce, or encourage any such person to terminate or leave the Company's employ, engagement, or other remunerative relationship with the Company. You acknowledge that this covenant is necessary to enable the Company to maintain a stable workforce and remain in business.

e. Confidentiality.

i. You will keep in strict confidence, and will not, directly or indirectly, at any time, during or after your employment with the Company, disclose, furnish, disseminate, make available or, except in the course of performing your duties of employment, use any trade secrets or confidential business and technical information of the Company or its Customers, suppliers or vendors, without limitation as to when or how you may have acquired such information. Such confidential information will include, without limitation, all information belonging to the Company, its affiliates, subsidiaries, or any other person or entity that has entrusted information to the Company in confidence, technology, computer programs or programming, systems, software, software codes, designs, data bases, trade secrets, know-how, research, methods, manuals, records, product or service ideas or plans, work-in-progress, results, algorithms, inventions, developments, original works of authorship, discoveries, experimental processes, experimental results, unpublished patent applications, laboratory notebooks, processes, formulas, investigation or research techniques, engineering designs and drawings, hardware configuration information, regulatory information, medical reports, clinical data and analysis reagents, cell lines, biological materials, chemical formulas, financial information including but not limited to price lists, pricing methodologies, cost data, financial forecasts, historical financial data, and budgets, marketing

information, including but not limited to market share data, marketing plans, licenses, business plans, lists of the needs and preferences of Customers and Prospective Customers, promotional materials, training courses and other training and instructional materials, vendor and product information, all agreements with third parties and terms of agreements, transactions and potential transactions, negotiations, information relating to employees and consultants of the Company, including names, contact information, and expertise, lists of or information relating to suppliers and vendors and other business information disclosed by the Company (whether by oral, written, graphic or machine-readable format) which confidential information is designated in writing to be confidential or proprietary, or if given orally, is confirmed in writing as having been disclosed as confidential or proprietary within a reasonable time (not to exceed 30 days after the oral disclosure), or which information would, under the circumstances appear to a reasonable person to be confidential or proprietary. Notwithstanding anything to the contrary herein, confidential information shall not include any information for which you can demonstrate by convincing evidence that: (I) have been known or developed by Employee independent of any disclosure by Company; (II) is or becomes available to the public through no breach of this Agreement; (III) is lawfully obtained from a third party without restriction and without breach of this or any other agreement; (IV) is required by law to be disclosed in response to a valid order of a court of competent jurisdiction or authorized governmental agency; or (V) is approved for release by Company.

ii. You specifically acknowledge that all such confidential information, whether reduced to writing, maintained on any form of electronic media, or maintained in your mind or memory and whether compiled by the Company, and/or you, derives independent economic value from not being readily known to or ascertainable by proper means by others who can obtain economic value from its disclosure or use, that reasonable efforts have been made by the Company to maintain the secrecy of such information, that such information is the sole property of the Company and that any retention and your use of such information during your employment with the Company (except in the course of performing your duties and obligations to the Company) or after the termination of your employment will constitute a misappropriation of the Company's confidential information and/or trade secrets.

iii. The U.S. Defend Trade Secrets Act of 2016 ("*DTSA*") provides that an individual shall not be held criminally or civilly liable under any federal or state trade secret law for the disclosure of a trade secret that (A) is made in confidence to a federal, state or local government official, either directly or indirectly, or to an attorney, and solely for the purpose of reporting or investigating a suspected violation of law; or (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. In addition, the DTSA provides that an individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual files any document containing the trade secret under seal and does not disclose the trade secret, except pursuant to court order.

iv. You agree that upon termination of your employment with the Company, for any reason, you will return to the Company, in good condition, all property of the Company, including without limitation, the originals and all copies of any documents in whatever form (electronic, hard copy, etc.) or materials which contain, reflect, summarize, describe, analyze or refer or relate to any items of information listed in subparagraph 8(e)(i) of this Letter. You agree that all confidential information, as listed in subparagraph 8(e)(i) of this Letter is the sole property of the Company and you have no right, title or interest to this property. In the event that such items are not so returned, the Company will have the right to charge you for all reasonable damages, costs, attorneys' fees and other expenses incurred in searching for, taking, removing and/or recovering such property.

v. Notwithstanding the above, you will have no liability to the Company with regard to any confidential information you can prove was in the public domain at the time it was disclosed or entered the public domain through no fault of yours.

f. Discoveries and Inventions; Work Made for Hire.

i. You agree that upon conception and/or development of any idea, discovery, invention, improvement, software, writing or other material or design that: (A) relates to the business of the Company, or (B) relates to the Company's actual or demonstrably anticipated research or development, or (C) results from any work performed by you for the Company, you will assign to the Company the entire right, title and interest in and to any such idea, discovery, invention, improvement, software, writing or other material or design (together, "Discoveries and Inventions"). Subject to the requirements of applicable state law, if any, you understand that Discoveries and Inventions will not include, and the provisions of this Letter will not apply to any idea, discovery, invention, improvement, software, writing or other material or design that qualifies fully for exclusion under the provisions of applicable state law. You also agree that any idea, discovery, invention, improvement, software, writing or other material or design that relates to the business of the Company or relates to the Company's actual or demonstrably anticipated research or development which is conceived or suggested by you, either solely or jointly with others, within one year following termination of your employment under this Letter or any successor agreements will be presumed to have been so made, conceived or suggested in the course of such employment with the use of the Company's equipment, supplies, facilities, and/or trade secrets.

ii. You agree that during your employment, and for one year after termination of your employment under this Letter or any successor agreements, you will disclose immediately and fully to the Company any Discovery and Invention conceived, made or developed by you solely or jointly with others. The Company agrees to keep any such disclosures confidential. You also agree to record descriptions of all work in the manner directed by the Company, agree that all such records and copies, samples and experimental materials will be the exclusive property of the Company, and agree not to remove these records from the Company's place of business except as expressly permitted by Company policy which may, from time to time, be revised at the sole election of the Company for the purpose of furthering the Company's business. You agree that at the request of and without charge to the Company, but at the Company's expense, you will execute a written assignment of the idea, discovery, invention, improvement, software, writing or other material or design to the Company and will assign to the Company any application for letters patent or for trademark registration made thereon, and to any common-law or statutory copyright therein; and that you will do whatever may be necessary or desirable to enable the Company to secure any patent, trademark, copyright, or other property right therein in the United States and in any foreign country, and any division, renewal, continuation, or continuation in part thereof, or for any reissue of any patent issued

thereon. In the event the Company is unable, after reasonable effort, and in any event after ten business days, to secure you signature on a written assignment to the Company of any application for letters patent or to any common-law or statutory copyright or other property right therein, whether because of your physical or mental incapacity or for any other reason whatsoever, you irrevocably designate and appoint the CEO of the Company as your attorney-in-fact to act on your behalf to execute and file any such application and to do all other lawfully permitted acts to further the prosecution and issuance of such letters patent, copyright or trademark Any assignment of the rights to an idea, discovery, invention, improvement, software, writing or other material or design includes all rights of attribution, paternity, integrity, modification, disclosure and withdrawal, any other rights throughout the world that may be known or referred to as "moral rights," "artists rights," "droit moral," or the like. ("Moral Rights") To the extent that Moral Rights cannot be assigned under applicable law, you hereby waive and agree not to enforce any and all Moral Rights, including, without limitation, any limitation on subsequent modification, to the extent permitted under applicable law.

iii. You acknowledge that, to the extent permitted by law, all work papers, reports, documentation, drawings, photographs, negatives, tapes and masters therefor, prototypes and other materials (hereinafter, "items"), including without limitation, any and all such items generated and maintained on any form of electronic media, generated by you during your employment with the Company will be considered a "work made for hire" and that ownership of any and all copyrights in any and all such items will belong to the Company. The item will recognize the Company as the copyright owner, will contain all proper copyright notices, e.g., "(creation date), All Rights Reserved," and will be in condition to be registered or otherwise placed in compliance with registration or other statutory requirements throughout the world.

g. Communication of Contents of Letter. While employed by the Company and for one year thereafter, you will communicate the contents of paragraph 8 of this Letter to any person, firm, association, partnership, corporation or other entity that you intend to be employed by, associated with, or represent.

h. Confidentiality Agreements. You agree that you will not disclose to the Company or induce the Company to use any secret or confidential information belonging to your former employers. Before the execution of this agreement, you agree to provide the Company with a copy of the relevant sections of any and all agreements with a third party that preclude or limit your right to make disclosures or to engage in any other activities contemplated by your employment with the Company (the "Prior Employment Documents").

i. Relief. You acknowledge and agree that the remedy at law available to the Company for breach of any of your obligations under this Letter would be inadequate. You therefore agree that, in addition to any other rights or remedies that the Company may have at law or in equity, temporary and permanent injunctive relief may be granted in any proceeding which may be brought to enforce any provision contained in subparagraphs 8(b), 8(d), 8(e), 8(f), 8(g) and 8(h) inclusive, of this Letter, without the necessity of proof of actual damage or the need to post a bond.

j. Reasonableness. You acknowledge that your obligations under this paragraph 8 are reasonable in the context of the nature of the Company's Business and the competitive injuries likely to be sustained by the Company if you were to violate such obligations. You further acknowledge that this Letter is made in consideration of, and is adequately supported by the agreement of the Company to perform its obligations under this Letter and by other consideration, which you acknowledge constitutes good, valuable and sufficient consideration.

9. Definitions.

a. "Customer" means any client, customer or account, including, but not limited to any person, firm, corporation, association or other business entity of any kind to which the Company has provided or is providing products or services.

b. "Company's Business" means the research, development, and/or commercialization of products and services based on gene-editing technologies in the field of agriculture food and plant sciences, which is to be construed to include all research, development, and/or commercialization of products and services as may hereinafter evolve within the gene editing field or is in planning or developmental stages at the Company.

c. "Permanent Disability" means that, because of accident, disability, or physical or mental illness, you are deemed permanently incapable of performing your duties to the Company or any subsidiary, as determined in accordance with the Company's then current disability insurance policy.

d. "Prospective Customer" means any prospective client, customer or account, including, without limitation, any person, firm, corporation, association or other business entity of any kind with which the Company had any negotiations or substantial discussions regarding the possibility of providing products or services within the one (1) year period preceding your Termination Date.

e. "Section 409A" means Section 409A of the Internal Revenue Code of 1986, as amended, and any guidance issued thereunder.

f. "Termination Date" means the effective date of your termination of employment with the Company.

g. "Termination For Cause" means the termination by the Company of your employment with the Company or any subsidiary as a result of (i) your conviction of or plea of guilty or nolo contendere to a crime that constitutes a felony or a crime that constitutes a misdemeanor involving moral turpitude; (ii) your engagement in an act of fraud, dishonesty, or unauthorized disclosure of Confidential Information (as defined in this Letter); (iii) your willful failure or refusal to comply with any valid and legal directive of the Board of Directors or the CEO; (iv) your gross negligence or willful misconduct with respect to the Company or any subsidiary or affiliate of the Company; (v) your failure or refusal to perform your duties and responsibilities as General Counsel, (other than such failure resulting from incapacity due to physical or mental illness or temporary or permanent disability) which is not cured within five (5) days after written notice thereof to you; (vi) your material failure to comply with the Company's written policies or rules, red within five (5) days after written notice thereof to you; (vii) your willful misconduct which has, or can reasonably expected to have, a direct and material adverse monetary effect on the Company or (viii) your material breach of this Letter or any other written agreement with the Company, which is not cured within thirty (30) days after written notice thereof to you.

h. "Termination Without Cause" means the termination by the Company of your employment with the Company for any reason other than a termination for Permanent Disability, death, or a Termination for Cause.

10. Section 409(A).

a. General Compliance. This Letter is intended to comply with Section 409(A) or an exemption thereunder and will be construed and administered in accordance with Section 409(A). Notwithstanding any other provision of this Letter, payments provided under this Letter may only be made upon an event and in a manner that complies with Section 409(A) or an applicable exemption. Any payments under this Letter that may be excluded from Section 409(a) either as separation pay provided due to an involuntary separation from

service or as a short-term deferral will be excluded from Section 409(A) to the maximum extent possible. For purposes of Section 409(A), each installment payment provided under this Letter will be treated as a separate payment. Any payments to be made under this Letter upon a termination of employment will only be made upon a "separation from service" under Section 409A. Notwithstanding the foregoing, the Company makes no representations that the payments and benefits provided under this Letter comply with Section 409A and in no event will the Company be liable for all or any portion of any taxes, penalties, interest or other expenses that may be incurred by you on account of non-compliance with Section 409A.

b. Specified Employees. Notwithstanding any other provision of this Letter, if any payment or benefit provided to you in connection with your termination of employment is determined to constitute "non-qualified deferred compensation" within the meaning of Section 409A and you are determined to be a "specified employee" at that time as defined in Section 409A(a)(2)(b)(i), then such payment or benefit will not be paid until the first payroll date to occur following the six-month anniversary of the Termination Date (the "Specified Employee Payment Date") or, if earlier, on your death. The aggregate of any payments that would otherwise have been paid before the Specified Employee Payment Date (and interest on such amounts calculated based on the applicable federal rate published by the Internal Revenue Service for the month in which your separation from service occurs shall be paid to the you in lump sum on the specified Employee Payment date and thereafter, any remaining payments will be paid without delay in accordance with their original schedule.

11. Representations. As of the Effective Date, you represent and warrant to the Company that, except for the Prior Employment Documents described in Section 8(h):

a. Your acceptance of employment with the Company and your performance of the duties and responsibilities under this Letter will not conflict with or result in a violation of, a breach of, or a default under any contract, agreement or understanding to which she is a party or otherwise bound.

b. Your acceptance of employment with the Company and the performance of your duties and responsibilities under this Letter will not violate any non-solicitation, non-competition or other similar covenant or agreement of a prior employer.

12. Survival. Upon the termination of this Letter, the respective rights and obligations of the parties hereto will survive this termination to the extent necessary to carry out the intention of the parties to this Letter.

13. Taxes. The Company may withhold from any amounts payable under this Letter all federal, state, city or other taxes as the Company is required to withhold pursuant to any applicable law, regulation or ruling. Notwithstanding any other provision of this Letter, the Company will not be obligated to guarantee any particular tax result for you with respect to any payment provided to you hereunder, and you will be responsible for any taxes imposed on you with respect to any such payment.

14. Notices. Any notice provided for in this Letter will be in writing, with a copy to respective individual email addresses, and will be either personally delivered, sent by reputable overnight carrier or mailed by first class mail, return receipt requested, to the recipient at the address below indicated:

Notices to the Company:
Mr. Jim Blome, CEO
Calyxt, Inc.
2800 Mount Ridge Road
Roseville, MN 55113

or such other address or to the attention of such other person as the recipient party will have specified by prior written notice to the sending party. Any notice under this Letter will be deemed to have been given when so delivered.

15. Severability. Whenever possible, each provision of this Letter will be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Letter is held to be invalid or unenforceable in any respect under any applicable law, such invalidity or unenforceability will not affect any other provision, but this Letter will be reformed, construed and enforced as if such invalid or unenforceable provision had never been contained herein. Should a determination be made by the Court designated in paragraph 20 hereof that the character, duration, or geographical scope of paragraph 8 of the Letter is unreasonable in light of the circumstances as they then exist, then it is the intention and the agreement of the parties to the Letter that the provision be construed by the Court in such a manner as to impose only those restrictions on the parties that are reasonable in light of the circumstances as they then exist and as are necessary to assure the parties of the intended benefit of the Letter. If, in any judicial proceeding, the Court refuses to enforce all of the

separate provisions included in the Letter because, taken together, they are more extensive than necessary to assure the parties of the intended benefit of the Letter, those provisions which, if eliminated, would permit the remaining separate provisions to be enforced in such proceeding, will, for the purpose of such proceeding, be deemed eliminated from the Letter.

16. Complete Agreement. This Letter embodies the complete agreement and understanding between the parties with respect to the subject matter hereof and effective as of its date supersedes and preempts any prior understandings, agreements or representations by or between the parties, written or oral, which may have related to the subject matter hereof in any way.

17. Counterparts. This Letter may be executed in separate counterparts, each of which will be deemed to be an original and both of which taken together will constitute one and the same agreement.

18. Successors and Assigns. This Letter will bind and inure to the benefit of and be enforceable by you, the Company and your and the Company's respective heirs, executors, personal representatives, successors and assigns, except that neither party may assign any rights or delegate any obligations hereunder without the prior written consent of the other party. You hereby consent to the assignment by the Company of all of its rights and obligations hereunder to any successor to the Company by merger or consolidation or purchase of all or substantially all of the Company's assets, provided such transferee or successor assumes the liabilities of the Company hereunder.

19. Governing Law. This Letter will be governed by, and construed in accordance with, the internal, substantive laws of the State of Minnesota. You agree that the state and federal courts located in the State of Minnesota, without regard to or application of conflict of laws principles, will have jurisdiction in any action, suit or proceeding against you based on or arising out of this Letter and you hereby: (a) submit to the personal jurisdiction of such courts; (b) consent to service of process in connection with any action, suit or proceeding against you; and (c) waive any other requirement (whether imposed by statute, rule of court or otherwise) with respect to personal jurisdiction, venue or service of process.

20. Amendment and Waiver. The provisions of this Letter may be amended or waived only with the prior written consent of you and the Company, and no course of conduct or failure or delay in enforcing the provisions of this Letter will affect the validity, binding effect or enforceability of this Letter.

21. Acknowledgement of Full Understanding. I acknowledge and agree that I have fully read and understand this Letter, and I have had the opportunity to ask questions and consult with an attorney of my choice before signing this Letter.

If these terms are acceptable to you, please sign and date this Letter in the appropriate space below and return it to me as soon as possible. We look forward to you becoming a part of our team.

Please call me with any questions.

Sincerely,

/s/ Jim BLOME
Jim BLOME, CEO

Date: _____

Agreed and Accepted:

/s/ Debra Frimerman
Debra Frimerman

Date: 1/21/19

**Exhibit 23.1**

**Consent of Independent Registered Public Accounting Firm**

We consent to the incorporation by reference in the Registration Statement (Form S-8 No. 333-219382) pertaining to the Calyxt, Inc. 2017 Omnibus Incentive Plan and the Calyxt, Inc. Equity Incentive Plan of Calyxt, Inc. of our report dated March 11, 2019, with respect to the financial statements of Calyxt, Inc. included in this Annual Report (Form 10-K) for the year ended December 31, 2018.

/s/ Ernst & Young LLP

Minneapolis, Minnesota
March 11, 2019

**Exhibit 31.1**

**CERTIFICATION PURSUANT TO RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT, AS AMENDED**

I, James A. Blome, certify that:

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

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

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

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

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

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

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

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

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

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

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

Date: March 11, 2019

/s/ James A. Blome

James A. Blome
Chief Executive Officer

**Exhibit 31.2**

**CERTIFICATION PURSUANT TO RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT, AS AMENDED**

I, William F. Koschak, certify that:

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

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

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

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

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

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

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

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

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

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

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

Date: March 11, 2019

/s/ William F. Koschak

William F. Koschak
Chief Financial Officer

**Exhibit 32**

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

In connection with the Annual Report of Calyxt, Inc. (the "Company") on Form 10-K for the period ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned hereby certifies, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that, to his knowledge:

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

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

Date: March 11, 2019

/s/ James A. Blome

James A. Blome
Chief Executive Officer
(Principal Executive Officer)

/s/ William F. Koschak

William F. Koschak
Chief Financial Officer
(Principal Financial Officer)