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

FORM 10-K

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

For the fiscal year ended December 31, 2022

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 001-37752

CHROMADEX CORPORATION

(Exact name of Registrant as specified in its Charter)

Delaware	**26-2940963**
(State or other jurisdiction of incorporation)	(I.R.S. Employer Identification No.)

10900 Wilshire Blvd. Suite 600, Los Angeles, CA 90024
(Address of Principal Executive Offices and Zip Code)

Registrant's telephone number, including area code (310) 388-6706

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, $0.001 par value per share	CDXC	The Nasdaq Capital Market

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

Indicate by check mark:

• if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.	☐ Yes ☑ No
• if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.	☐ Yes ☑ No
• 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
• whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).	☑ Yes ☐ No
• whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "accelerated filer," "large accelerated filer," and "smaller reporting company" in Rule 12b-2 of the Exchange Act.	
Large accelerated filer ☐ Accelerated filer ☐ Non-accelerated filer ☑ Smaller reporting company ☑ Emerging growth company ☐	
• if an emerging growth company, 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.	☐ Yes ☐ No

• whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.	☐ Yes	☑ No
• If securities are registered pursuant to Section 12(b) of the Act, whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements.	☐ Yes	☑ No
• whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b).	☐ Yes	☑ No
• whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).	☐ Yes	☑ No

As of June 30, 2022, the last business day of the registrant's most recently completed second fiscal quarter, the aggregate market value of the registrant's common stock held by non-affiliates of the registrant was approximately $79.2 million, based on the closing price of the registrant's common stock on the Nasdaq Capital Market on June 30, 2022.

Number of shares of common stock of the registrant outstanding as of March 6, 2023: 74,838,491.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's proxy statement (Proxy Statement) to be filed with the Securities and Exchange Commission (SEC) pursuant to Regulation 14A in connection with the Registrant's 2023 Annual Meeting of Stockholders, which will be filed subsequent to the date hereof, are incorporated by reference into Part III of this Form 10-K. Such Proxy Statement will be filed with the SEC not later than 120 days following the end of the Registrant's fiscal year ended December 31, 2022.

CHROMADEX CORPORATION
ANNUAL REPORT ON FORM 10-K
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PART I

Cautionary Notice Regarding Forward-Looking Statements

This Annual Report on Form 10-K (Form 10-K) contains "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended (Securities Act), and Section 21E of the Securities Exchange Act of 1934, as amended, (Exchange Act) which are subject to the safe harbor created by those sections. We may, in some cases, use words such as "expects," "anticipates," "intends" "estimates," "plans," "potential," "possible," "probable," "believes" "seeks," "may," "will," "should," "could," "predicts," "projects," "continue," "would" or the negative of these terms, and similar expressions that convey uncertainty of future events or outcomes to identify these forward-looking statements. Any statements contained herein that are not statements of historical facts may be deemed to be forward-looking statements and are based upon our current expectations, beliefs, estimates and projections, and various assumptions, many of which, by their nature, are inherently uncertain and beyond our control. Such statements, include, but are not limited to, statements contained in this Form 10-K relating to our business, business strategy, products and services we may offer in the future, the outcome and impact of litigation, the timing and results of future regulatory filings, the timing and results of future clinical trials, our ability to collect from major customers, sales and marketing strategy and capital outlook. Forward-looking statements are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Because forward looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict. Our actual results may differ materially from those contemplated by the forward-looking statements. They are neither statement of historical fact nor guarantees of assurance of future performance. We caution you therefore against relying on any of these forward-looking statements. Important factors that could cause actual results to differ materially from those in the forward looking statements include, but are not limited to, our relationships with major customers; our ability to maintain our sales, marketing, and distribution capabilities; a decline in general economic conditions nationally and internationally; inflationary conditions; the impact of the COVID-19 pandemic on our business and operations, as well as the business or operations of our suppliers, customers, manufacturers, research partners and other third parties with whom we conduct business; the market and size of the vitamin mineral and dietary supplement market; decreased demand for our products and services; market acceptance of our products; the ability to protect our intellectual property rights; impact of any litigation or infringement actions brought against us; competition from other providers and products; risks in product development; our reliance on of a limited number of third-party party suppliers for certain raw materials; inability to raise capital to fund continuing operations; changes in government regulation; the ability to complete customer transactions and capital raising transactions, and other factors (including the risks contained in Item 1A of this Form 10-K under the heading "Risk Factors") relating to our industry, our operations and results of operations and any businesses that may be acquired by us. Should one or more of these risks or uncertainties materialize, or should the underlying assumptions prove incorrect, actual results may differ significantly from those anticipated, believed, estimated, expected, intended or planned. Factors or events that could cause our actual results to differ may emerge from time to time, and it is not possible for us to predict all of them, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We cannot guarantee future results, levels of activity, performance or achievements. Except as required by applicable law, we undertake no obligation to and do not intend to update any of the forward-looking statements to conform these statements to actual results.

Item 1. Business

Unless otherwise indicated or the context otherwise requires, references to the Company, ChromaDex, we, us and our refer to ChromaDex Corporation and its consolidated subsidiaries.

Company Background

On May 21, 2008, Cody Resources, Inc., a Nevada corporation and a public company, (Cody) entered into an Agreement and Plan of Merger (Merger Agreement), by and among Cody, CDI Acquisition, Inc., a California corporation and wholly-owned subsidiary of Cody (Acquisition Sub), and ChromaDex, Inc. (Merger). Subsequent to the signing of the Merger Agreement, Cody merged with and into a Delaware corporation. On June 20, 2008, Cody amended its articles of incorporation to change its name to ChromaDex Corporation. ChromaDex Corporation was traded on the over-the-counter market under the symbol "CDXC." On April 25, 2016, ChromaDex Corporation became listed on the Nasdaq Capital Market under the symbol "CDXC."

ChromaDex, Inc., a wholly owned subsidiary of ChromaDex Corporation, was originally formed as a California corporation on February 19, 2000.

On March 12, 2017, ChromaDex Corporation acquired Healthspan Research LLC, a consumer product company offering Tru Niagen® branded products. This marked the strategic shift to become a global bioscience company dedicated to healthy aging. On September 5, 2017, the Company completed the sale of its operating assets that were used with the Company's quality verification program testing and analytical chemistry business for food and food related products to Covance Laboratories Inc. On January 15, 2021, Healthspan Research LLC was dissolved. Prior to its dissolution, Healthspan Research, LLC contributed its assets and liabilities to ChromaDex, Inc.

Company Overview

ChromaDex is a global bioscience company dedicated to healthy aging. Our team, which includes world-renowned scientists, is pioneering research on nicotinamide adenine dinucleotide (NAD+), an essential coenzyme that is a key regulator of cellular metabolism and is found in every cell of the human body. NAD+ levels in humans have been shown to decline by more than 50% from young adulthood to middle age. In addition to age, other factors linked to NAD+ depletion include poor diet, excess alcohol consumption and a number of disease states. NAD+ levels may be increased through supplementation with NAD+ precursors, such as nicotinamide riboside (NR), calorie restriction and moderate exercise.

In 2013, we commercialized Niagen®, a proprietary form of NR, a novel form of vitamin B3. Data from numerous preclinical studies and human clinical trials show that NR is a highly efficient NAD+ precursor that significantly raises NAD+ levels in blood and tissue. Niagen® is confirmed safe for human consumption as a dietary supplement and food ingredient. Niagen® has twice been successfully reviewed under the U.S. Food and Drug Administration's (FDA) new dietary ingredient (NDI) notification program, it has been successfully notified to the FDA as generally recognized as safe (GRAS), and has been approved by Health Canada, the European Commission, the Turkish Ministry of Agriculture and the Therapeutic Goods Administration (TGA) of Australia. Niagen® has also been approved for inclusion in medical foods by both the Brazilian Health Regulatory Agency (ANVISA) and the Food Standards Australia New Zealand (FSANZ). Clinical studies of Niagen® have demonstrated a variety of outcomes including increased NAD+ levels, altered body composition, increased cellular metabolism and increased energy production. Niagen® is protected by patents to which we are the owner or have exclusive rights.

While best known for its role in cellular energy production, NAD+ is also thought to play an important role in healthy aging. Many cellular functions related to health and healthy aging are sensitive to levels of locally available NAD+ and this represents an active area of research in the field of NAD+. To date, there are over 475 published human clinical studies related to NAD+ and its impact on health. These areas of study include understanding NAD+'s role in Alzheimer's disease, Parkinson's disease, neuropathy, sarcopenia, liver disease and heart failure.

We are among the world leaders in the emerging NAD+ space. Through our ChromaDex External Research Program (CERP™), we have amassed more than 250 research partnerships with leading universities and research institutions around the world including the National Institutes of Health, Cornell, Dartmouth, Harvard, Massachusetts Institute of Technology, University of Cambridge, the Mayo Clinic, Chiba University and Sun Yat-sen University. The results of the 250+ research agreements have allowed CERP™ to help produce the trusted science behind Niagen® and continue to advance the understanding of NAD+ in health, diseases, and aging. We value and encourage strong scientific rigor behind our products and seek to continually develop additional relationships in pursuit of this. CERP™ is a vital component of our research and development platform along with our scientific advisory board. Our scientific advisory board supports the technical and intellectual property needs of investigators, presents research at conferences, and helps build and support the NAD+ and healthy aging research community.

Our scientific advisory board is led by Chairman Dr. Roger Kornberg, Nobel Laureate Stanford Professor, Dr. Charles Brenner, one of the world's recognized experts in NAD+ and discoverer of NR as a NAD+ precursor, Dr. Rudy Tanzi, the co-chair of the department of neurology at Harvard Medical School, Sir John Walker, Nobel Laureate and Emeritus Director, MRC Mitochondrial Biology Unit in the University of Cambridge, England, Dr. Bruce German, Chairman of food, nutrition and health at the University of California, Davis, Dr. Brunie Felding, Associate Professor, Department of Molecular Medicine at Scripps Research Institute, California Campus, Dr. David Katz, the Founder and former director of Yale University's Yale-Griffin Prevention Research Center, President and Founder of the non-profit True Health Initiative, and Founder and Chief Executive Officer of Diet ID, Inc. and Dr. Vilhelm (Will) Bohr, M.D., Ph.D., D.Sc., former Chief of the Laboratory of Molecular Genetics at the National Institute on Aging of the National Institutes of Health.

Business Model, Products and Services

Consumer Products Segment

Through our consumer products segment, we provide finished dietary supplement products that contain the Company's proprietary ingredients, commercialized as Tru Niagen®, directly to consumers and distributors. As one of the world leaders in the emerging NAD+ space and the science of healthy aging, we continuously strive to evolve our Tru Niagen® products through the exploration, discovery and enhancement of patented technologies. The Tru Niagen® brand is built on a dedication to scientific evidence and improving consumer health by safely raising NAD+ levels to help consumers age better. Our principal objective is to increase awareness of the Tru Niagen® brand worldwide including through expanded access to consumers by entering new markets, retail platforms and other opportunities.

We remain focused on expanding marketing and distribution of the Tru Niagen® brand in new strategic international markets and securing the regulatory approvals necessary to accomplish the same. We began international expansion of the Tru Niagen® brand with the launch in Hong Kong and Macau with our strategic partner, A.S. Watson Group, in 2017. Since then, we have further expanded into Singapore, New Zealand, Canada, Australia, China, Korea, Japan, the United Kingdom and other European markets. We support our international operations in various capacities which include supplying our international strategic partners with finished products manufactured in the U.S, as well as marketing materials and know-how. Simultaneously, we continue to support our proprietary e-commerce platforms and the e-commerce platforms of strategic regional and local partners within the U.S while further exploring opportunities for new domestic channels.

Ingredients Segment

Through our ingredients segment, we provide Niagen® in ingredient form to our strategic partners, including Nestec Ltd. (Nestlé), a global leader in pioneering quality science-based nutritional health solutions. We also offer Immulina®, a spirulina extract with predominant active compounds of Braun-type lipoproteins which are useful for supporting human immune function. Our mission is to continue to identify, acquire and commercialize other innovative proprietary ingredients and technologies. Our experienced team is capable of advancing products through early development into commercialization with the required regulatory approval, safety, toxicology and clinical trials as well as providing supply chain management and manufacturing needs to ultimately sell the ingredient products directly or license to third parties.

Analytical Reference Standards and Services Segment

Since 1999, we have provided research and quality-control products and services through our analytical reference standards and services segment and have positioned ourselves as a leader in the industry. Customers worldwide in the dietary supplement, food and beverage, cosmetic, pharmaceutical, and life sciences industries utilize our products, which are small quantities of highly-characterized, phytochemicals, natural products and plant-based materials, to ensure the quality of their raw materials and finished products. We also provide research services for customers exploring the frontier of natural product research and development.

We have taken advantage of both supply chain needs and regulatory requirements to build our analytical reference standards and services segment. We believe we create value throughout the supply chain of the dietary supplements, functional foods, life science research, personal care markets and associated analytical testing laboratories. We intend to capitalize on additional opportunities in product development and commercialization of various kinds of intellectual property that we have largely discovered and acquired through the sales process associated with this segment.

Business Market

According to data from Global Wellness Institute, the global wellness industry market was approximately $4.4 trillion in 2020 amidst the disruptions of COVID-19, which is down from $4.9 trillion in 2019. In 2020, the personal care, beauty and anti-aging market was approximately $960 billion, healthy eating, nutrition and weight loss was approximately $950 billion and traditional and complementary medicine market was approximately $410 billion. The Global Wellness Institute projects the overall wellness economy to grow approximately 10% annually, or 60% in total, from 2020 to 2025, with most segments projected to exceed GDP growth.

According to data from Grand View Research, the global dietary supplements market size was estimated at $164 billion in 2022, and is expected to grow at a compound annual growth rate of 8.9% from 2022 to 2030.

For the years ended December 31, 2022 and 2021, our net sales were approximately $72.1 million and $67.4 million, respectively. The following table summarizes total net sales for each of our business segments in the last two years. Please refer to Item 8 Financial Statements and Supplementary Data of this Form 10-K for additional financial information about each of our business segments.

	Year Ended December 31,	
(In thousands)	**2022**	**2021**
Consumer Products Segment	$ 60,110	$ 56,705
Ingredients Segment	8,736	7,407
Analytical Reference Standards and Services Segment	3,204	3,337
Total net sales	$ 72,050	$ 67,449

Major Customers

For the years ended December 31, 2022 and 2021, we had one major customer which accounted for more than 10% of our total net sales. A.S. Watson Group, a related party, accounted for approximately 13.9% and 13.8% of our net sales for the years ended December 31, 2022 and 2021, respectively. The loss of or deterioration in relationship with this customer would have a material adverse effect on our business and financial condition.

Sales and Marketing Strategy

Consumer Products Segment

We employ a variety of strategies to drive sales and consumer awareness of Tru Niagen®, including social media and internet advertising, managing affiliate marketing, influencer campaigns and marketing, paid spokespersons and talent, events and trade shows, e-mail marketing campaigns, paid search advertising and distribution of research publications and press releases. We also have a dedicated customer care department that handles day-to-day communications with our end customers addressing any needs or concerns related to our Tru Niagen® products.

United States of America: We distribute Tru Niagen® products direct to consumers through our propriety e-commerce platform TruNiagen.com, Amazon, ShopHQ and other established internet marketplaces. We also partner with specialty retailers and direct healthcare practitioners who are authorized resellers of Tru Niagen® in the United States.

International: We utilize strategic partners on a regional or local country basis to expand our distribution of Tru Niagen® products internationally. Our strategic partners offer our products through brick and mortar stores, e-commerce channels or a combination of both. With our strategic partners, we currently distribute Tru Niagen® products to the following international markets:

- Hong Kong (A.S. Watson Group);
- Macau (A.S. Watson Group);
- Singapore (A.S. Watson Group);
- New Zealand (Matakana Superfoods);
- Australia (Matakana Superfoods);
- China (Sinopharm);
- Korea (Juvenis, Coupang);
- Canada (CLM Health Group, Amazon, Fullscript Canada and www.TruNiagen.ca);
- Japan (Amazon);
- United Kingdom (Amazon);
- Germany (Amazon);
- France (Amazon);
- Italy (Amazon);
- Spain (Amazon);
- Poland (Amazon);
- Netherlands (Amazon); and
- Sweden (Amazon).

We continue to focus on obtaining additional regulatory approvals required to expand marketing and distribution of the Tru Niagen® brand in new strategic international markets. Currently, we are in the process of obtaining applicable regulatory approvals, including "Blue Hat" or health food registration with the Peoples Republic of China State Administration for Market Regulation for Tru Niagen® and other products containing nicotinamide riboside in our name or our designee (collectively, the "Blue Hat Registration") in connection with our joint venture agreement with Taikuk Group Ltd. Achieving Blue Hat Registration would notably broaden our sales opportunities in China and is at the forefront of our expansion goals. As of December 31, 2022, it is uncertain when Blue Hat Registration will be achieved. For additional discussion surrounding our joint venture agreement and Blue Hat Registration see Note 12, *Joint Venture*, in Item 8 Financial Statements and Supplementary Data of this Form 10-K.

Ingredients Segment & Analytical and Reference Standards Segments

Our ingredients segment is supported through the development of key partnerships since we do not currently offer our ingredients to the broader public. Sales to our partners are predominantly based in the United States, Hong Kong and Europe. Our partners sell multi-ingredient products featuring Niagen® in the U.S. and other international markets. For our analytical reference standards and services segment, we promote our products and services based on a direct, technically-oriented model. We recruit and hire sales and marketing staff with appropriate commercial and scientific backgrounds. Our analytical reference standards and services segment provides products and services to customers both within the United States and internationally. We offer unique and highly-characterized, phytochemicals, natural products and plant-based materials as well as tailored research services as requested through custom "Scope of Work" applications. For our international operations, we partner with international distributors to market and sell to several foreign countries and markets.

Total sales and marketing expense for the years ended December 31, 2022 and 2021 was approximately $28.3 million and $28.4 million, respectively.

Research and Development

The ChromaDex External Research Program (CERP™) is an essential component of our research and development platform. CERP™ was established to advance the science of nicotinamide riboside and other ChromaDex products. We value and encourage strong scientific rigor behind our products and have cultivated relationships with academic institutions in pursuit of this. Thus far, CERP™ has achieved over 250 research partnership agreements with leading universities and research institutions around the world including the National Institutes of Health, Cornell, Dartmouth, Harvard, Massachusetts Institute of Technology, University of Cambridge, the Mayo Clinic, Chiba University and Sun Yat-sen University. Additional relationships are currently being developed.

To date, over 300 peer-reviewed studies have been published on the science behind NR, including its NAD+ boosting properties, and there are over 475 published human clinical studies on NAD+ and its impact on health. CERP™ has produced more than 40% of all peer-reviewed NR-focused publications and 75% of the peer-reviewed clinical NR publications so far. To date, 24 peer-reviewed human clinical trials have been published on our proprietary ingredient Niagen® demonstrating its safety and/or efficacy through CERP™. No adverse effects have been attributed to Niagen® in any of the published clinical trials. In both 2015 and 2018, Niagen® was successfully notified to the FDA as an NDI. Niagen® was also successfully notified to FDA as Generally Recognized as Safe in August 2016.

Through our research and development laboratory in Longmont, Colorado, we venture to discover, develop and evaluate new products that we aim to take to market and explore cost saving processes for existing products. Research and development expense for the years ended December 31, 2022 and 2021 was approximately $4.8 million and $3.8 million, respectively.

Competitive Business Conditions

The health and wellness, anti-aging and dietary supplement industries are highly competitive, and we have competitors that offer products similar to our products. Many of our competitors may have significantly greater financial and human resources than our own. We seek to differentiate our products and marketing from our competitors by emphasizing product quality, product benefits, scientific rigor, and functional ingredients. Patent and trademark applications that protect brands, product names, and new technologies are pursued whenever possible. While we cannot assure that such measures will block competitive products, we believe our continued emphasis on innovation and new product development targeted at the needs of our consumers will enable us to effectively compete in the marketplace by building a trusted brand.

For our consumer products segment, we are in direct competition with Elysium Health who offers a similar product to Tru Niagen® as well as other providers of NAD+ boosting supplements. Additionally, we have customers who are authorized resellers of Niagen® as a consumer product. We believe these resellers are focused on specific channels that we feel are complementary to our business and expand awareness of the Niagen® ingredient and benefits. We also face strong indirect competition from other ingredient suppliers who may supply alternative ingredients that may have similar characteristics to ingredients we offer. For our analytical reference standards and services segment, we face competition within the standardization and quality testing niche of the markets we serve. These competitors have already developed reference standards or services or are currently taking steps to develop them. We strive to always provide superior products and services to our competition.

Working Capital

ChromaDex's working capital as of December 31, 2022 and 2021 was approximately $13.5 million and $8.4 million, respectively. We measure working capital by adding trade receivables and inventories and subtracting accounts payable. Our working capital is primarily comprised of assets and liabilities from our consumer products segment and ingredients segment as these operations require a considerable amount of inventory on hand. As each of these segments grow, greater working capital will likely be required to support these operations.

Government Regulation

Some of our operations are subject to regulation by various U.S. federal agencies and similar state and international agencies, including, but not limited to, the FDA, the Federal Trade Commission (FTC), the Consumer Product Safety Commission, the Department of Commerce, the Department of Transportation and the Department of Agriculture. These regulators govern a wide variety of production activities, from design and development to labeling, manufacturing, handling, selling and distributing of products. From time to time, federal, state and international legislation is enacted that may materially increase our cost of doing business or may limit or expand our permissible activities. We cannot predict whether or when potential legislation or regulations will be enacted, and, if enacted, the effect of such legislation, regulation, implementation, or any implemented regulations or supervisory policies would have on our financial condition or results of operations. In addition, the outcome of any litigation, investigations or enforcement actions initiated by state or federal authorities could result in required changes to our operations and increased compliance costs.

U.S. FDA Regulation

In the U.S., dietary supplements and food are subject to FDA regulations under the Federal Food, Drug and Cosmetic Act (FDCA). Areas addressed in these regulations include:

- product safety;
- product testing;
- ingredient testing;
- documentation process, batch records, specifications;
- product labeling;
- manufacturing facility registration;
- product manufacturing and storage;
- product claims, advertising and promotion;
- product sales and distribution; and
- product post-market surveillance.

The FDCA has been amended several times with respect to dietary supplements, most notably by the Dietary Supplement Health and Education Act of 1994 (DSHEA). DSHEA generally provides a regulatory framework to help ensure safe, quality dietary supplements and the dissemination of accurate information about such products. In particular, one aspect of the framework established by DSHEA provides that so-called "third-party literature", for example a reprint of a peer-reviewed scientific publication linking a particular nutritional ingredient with health benefits, may be used in connection with the sale of a nutritional supplement to consumers without the literature being subject to regulation as labeling. Such literature must not be false or misleading; the literature may not promote a particular manufacturer or brand of nutritional supplement; the literature must present a balanced view of the available scientific information on the nutritional supplement; if displayed in an establishment, the literature must be physically separate from the nutritional supplement; and the literature may not have appended to it any information by sticker or any other method. If the literature fails to satisfy each of these requirements, we may be prevented from disseminating it with our products, and any dissemination could subject our products to regulatory action as an illegal drug. Moreover, any written or verbal representation by us that would associate a nutrient in a product that we sell with an effect on a disease will be deemed evidence of intent to sell the product as an unapproved new drug, a violation of the FDCA. We are committed to meeting or exceeding all relevant FDA regulations under the FDCA.

U.S. Advertising Regulations

In addition to FDA regulations, the FTC regulates the advertising of dietary supplements, foods, cosmetics, and over-the-counter drugs. In recent years, the FTC has instituted numerous enforcement actions against dietary supplement companies for failure to adequately substantiate claims made in advertising or for the use of false or misleading advertising claims. These enforcement actions have often resulted in consent decrees and the payment of civil penalties, restitution, or both, by the companies involved. We may be subject to regulation under various state and local laws that include provisions governing, among other things, the formulation, manufacturing, packaging, labeling, advertising and distribution of dietary supplements, foods, cosmetics and over-the-counter drugs.

Additionally, state attorney's general and private plaintiff attorneys also regulate the advertising of dietary supplements, foods, cosmetics, and over-the-counter drugs through enforcement of state consumer protection laws. State attorney's general and, to a larger extent, private lawyers specializing in consumer class action litigation have instituted numerous enforcement actions against dietary supplement companies for failure to adequately substantiate claims made in advertising, for the use of false or misleading advertising claims, for underdosed products that don't meet label claims and allegations related to product safety. These actions have often resulted in consent decrees and the payment of civil penalties, restitution, or both, by the companies involved. We are not aware of, or party to, any action by a state attorney general or consumer class action involving our products.

Further, The National Advertising Division of the Council of Better Business Bureaus reviews national advertising for truthfulness and accuracy. The National Advertising Division of the Council of Better Business Bureaus uses a form of alternative dispute resolution, working closely with in-house counsel, marketing executives, research and development departments and outside consultants to decide whether claims have been substantiated. We are not aware of, or party to, any action by the National Advertising Division of the Council of Better Business Bureaus involving our products.

International Regulations

Our international sales for the consumer products segment and ingredients segment are subject to foreign government regulations, which vary substantially from country to country. Most countries, in particular major markets, have established regulations for (a) authorizing the introduction of novel ingredients to market in the food and/or dietary/food/health supplement sectors and (b) for allowing finished goods to be placed on the market for consumer access. Typically, novel ingredients must go through an extensive safety review process (similar to the NDI notification process in the U.S.) by a regulatory or scientific authoritative body. Finished products typically must either be notified or registered (a limited approval process) with the relevant authorities. In some cases, new products can be brought to market without notifying the authorities.

The time required to obtain approval by a foreign country may be longer or shorter than that required for the FDA notification process, and the requirements may differ. We may be unable to obtain on a timely basis, if at all, any foreign government approvals necessary for the marketing of our products abroad.

Regulation of foods/food supplements in Europe is exercised primarily through the European Union, which regulates the combined market of each of its member states. Other countries, such as Switzerland, have voluntarily adopted laws and regulations that mirror those of the European Union with respect to novel foods or new dietary ingredients.

Regulation in other major and established markets, including Canada, Japan, Brazil, China, Turkey and Australia all maintain and enforce a clear regulatory framework for novel ingredients and dietary supplements (or their equivalent).

Patents, Trademarks, Licenses, Franchises, Concessions, Royalty Agreements or Labor Contracts, Including Duration

We currently protect our intellectual property through patents, trademarks, designs and copyrights on our products and services. We have used and, to a limited extent, continue to use intellectual property harnessed from our analytical reference standards and services segment to create new proprietary ingredients to our customers. We aim to develop these proprietary ingredients ourselves and grant licenses to external companies for their commercialization.

The following table sets forth our existing patents and those to which we have licensed rights:

Patent Number	Title	Filling Date	Issued Date	Expires	Licensor
7,776,326	Methods and compositions for treating neuropathies	6/3/2005	8/17/2010	6/24/2026	Licensed from Washington University
7,846,452	Potent immunostimulatory extracts from microalgae	7/28/2005	12/7/2010	7/28/2025	Licensed from University of Mississippi
8,106,184	Nicotinyl Riboside Compositions and Methods of Use	11/17/2006	1/31/2012	9/20/2027	Licensed from Cornell University
8,114,626	Yeast strain and method for using the same to produce Nicotinamide Riboside	3/26/2009	2/14/2012	1/5/2026	Licensed from Dartmouth College
8,133,917	Pterostilbene as an agonist for the peroxisome proliferator-activated receptor alpha isoform	10/25/2010	3/13/2012	8/18/2025	Licensed from the University of Mississippi and U.S. Department of Agriculture
8,197,807	Nicotinamide Riboside Kinase compositions and Methods for using the same	4/20/2006	6/12/2012	11/19/2026	Licensed from Dartmouth College
8,252,845	Pterostilbene as an agonist for the peroxisome proliferator-activated receptor alpha isoform	2/1/2012	8/28/2012	8/18/2025	Licensed from the University of Mississippi and U.S. Department of Agriculture
8,383,086	Nicotinamide Riboside Kinase compositions and Methods for using the same	4/12/2012	2/26/2013	4/20/2026	Licensed from Dartmouth College
8,809,400	Method to Ameliorate Oxidative Stress and Improve Working Memory Via Pterostilbene Administration	8/8/2011	8/19/2014	10/2/2028	Licensed from the University of Mississippi and U.S. Department of Agriculture
8,841,350	Method for treating non-melanoma skin cancer by inducing UDP-Glucuronosyltransferase activity using pterostilbene	5/8/2012	9/23/2014	5/8/2032	Co-owned by ChromaDex and University of California
8,889,126	Methods and compositions for treating neuropathies	5/28/2010	11/18/2014	6/3/2025	Licensed from Washington University
9,000,147	Nicotyl riboside compositions and methods of use	1/17/2012	4/7/2015	11/17/2026	Licensed from Cornell University
9,028,887	Method improve spatial memory via pterostilbene administration	5/22/2014	5/12/2015	6/10/2028	Licensed from the University of Mississippi and U.S. Department of Agriculture
9,295,688	Methods and compositions for treating neuropathies	10/10/2014	3/29/2016	6/3/2025	Licensed from Washington University
9,321,797	Nicotyl riboside compositions and methods of use	11/17/2014	4/26/2016	11/17/2026	Licensed from Cornell University
9,439,875	Anxiolytic effect of pterostilbene	5/11/2011	9/13/2016	12/11/2031	Licensed from the University of Mississippi and U.S. Department of Agriculture
9,975,915	Crystalline forms of nicotinoyl ribosides, modified derivatives thereof, and phosphorylated analogs thereof, and methods of preparation thereof	11/10/2017	5/22/2018	11/10/2037	Co-owned with The Queen's University of Belfast and exclusively licensed by ChromaDex
10,000,519	Methods of Preparing Nicotinamide Riboside and Derivatives Thereof	7/24/2014	6/19/2018	7/24/2034	Licensed from The Queen's University of Belfast
10,000,520	B-vitamin and amino acid conjugates of nicotinoyl ribosides and reduced nicotinoyl ribosides, derivatives thereof, and methods of preparation thereof	3/16/2017	6/19/2018	3/16/2037	Co-owned with The Queen's University of Belfast and exclusively licensed by ChromaDex

Patent Number	Title	Filling Date	Issued Date	Expires	Licensor
10,183,036	Use of nicotinic acid riboside or nicotinamide riboside derivatives, and reduced derivatives thereof, as NAD+ increasing precursors	4/20/2017	1/22/2019	4/20/2037	Owned by ChromaDex
10,280,190	Nicotinic acid riboside or nicotinamide riboside compositions, reduced derivatives thereof, and the use thereof to enhance skin permeation in treating skin conditions	3/16/2016	5/7/2019	5/31/2036	Co-owned with The Queen's University of Belfast and exclusively licensed by ChromaDex
10,688,118	Nicotinamide riboside compositions for topical use in treating skin conditions	10/30/2014	6/23/2020	4/6/2035	Owned by ChromaDex
10,689,411	Efficient and scalable syntheses of nicotinoyl ribosides and reduced nicotinoyl ribosides, modified derivatives thereof, phosphorylated analogs thereof, adenylyl dinucleotide conjugates thereof, and novel crystalline forms thereof	11/10/2017	6/23/2020	11/10/2037	Co-owned with The Queen's University of Belfast and exclusively licensed by ChromaDex
10,815,262	Methods of preparing nicotinamide riboside and derivatives thereof	2/27/2018	10/27/2020	7/24/2034	Licensed from The Queen's University of Belfast
10,857,172	Use of nicotinamide riboside, nicotinic acid riboside, and nicotinamide mononucleotide, reduced nicotinyl compounds, and nicotinoyl compound derivatives in infant formula for healthy development	4/14/2017	12/8/2020	4/14/2037	Owned by ChromaDex
10,934,322	B-vitamin and amino acid conjugates of nicotinoyl ribosides and reduced nicotinoyl ribosides, derivatives thereof, and methods of preparation thereof	5/11/2018	3/2/2021	3/16/2037	Co-owned with The Queen's University of Belfast and exclusively licensed by ChromaDex
11,033,568	Nicotinamide riboside compositions for topical use in treating skin conditions	6/3/2020	6/15/2021	10/30/2034	Owned by ChromaDex
11,071,747	Use of NAD precursors for breast enhancement	11/29/2017	7/27/2021	11/29/2037	Licensed from University of Iowa
11,214,589	Crystalline forms of nicotinoyl ribosides and derivatives thereof, and methods of preparation thereof	12/10/2019	1/4/2022	8/16/2040	Owned by ChromaDex
11,242,364	Efficient and scalable syntheses of nicotinoyl ribosides and reduced nicotinoyl ribosides, modified derivatives thereof, phosphorylated analogs thereof, adenylyl dinucleotide conjugates thereof, and novel crystalline forms thereof	5/18/2021	2/8/2022	11/10/2037	Co-owned with The Queen's University of Belfast and exclusively licensed by ChromaDex
11,274,117	Efficient and scalable syntheses of nicotinoyl ribosides and reduced nicotinoyl ribosides, modified derivatives thereof, phosphorylated analogs thereof, adenylyl dinucleotide conjugates thereof, and novel crystalline forms thereof	4/30/2021	3/15/2022	11/10/2037	Co-owned with The Queen's University of Belfast and exclusively licensed by ChromaDex
11,345,720	Efficient and scalable syntheses of nicotinoyl ribosides and reduced nicotinoyl ribosides, modified derivatives thereof, phosphorylated analogs thereof, adenylyl dinucleotide conjugates thereof, and novel crystalline forms thereof	12/15/2021	5/31/2022	11/10/2037	Co-owned with The Queen's University of Belfast and exclusively licensed by ChromaDex
11,524,022	Use of nicotinamide riboside, nicotinic acid riboside, and nicotinamide mononucleotide, reduced nicotinyl compounds, and nicotinoyl compound derivatives in infant formula for healthy development	4/14/2017	12/13/2022	4/14/2037	Owned by ChromaDex
11,571,413	Nicotinamide riboside treatments of domesticated meat animals	6/26/2020	2/7/2023	9/27/2039	Licensed from Kansas State University
11,584,770	Methods of preparing nicotinamide riboside and derivatives thereof	5/4/2022	2/21/2023	7/24/2034	Licensed from Queen's University Belfast

Manufacturing, Sources and Availability of Raw Materials

Our finished products are manufactured by third-party FDA-regulated contract manufacturers in the United States with some raw materials sourced internationally. Each contract manufacturer upholds the standards imposed by the International Organization for Standardization as well as the high quality standards we require. We utilize third-party manufacturers to produce NR, encapsulate and bottle NR sold as a dietary supplement and produce and supply other ingredients, products, and services. In most cases, our contract manufacturers purchase raw materials based on our specifications; however, we may also license particular raw material ingredients and supply our own source to the manufacturer.

Following the receipt of products or product components from third-party manufacturers, in addition to in-house testing performed by the contract manufacturer, we perform independent analysis and testing to ensure conformance to our strict specifications. We continuously monitor and manage supplier performance through a corrective action program developed by us. We believe these manufacturing relationships can minimize our capital investment, help control costs, and allow us to compete with larger volume manufacturers of dietary supplements, phytochemicals and ingredients. From time to time, if our capacity permits and when demand or quality requirements make it appropriate to do so, we manufacture certain products or product components internally.

W.R. Grace & Co. -Conn. (Grace) is our exclusive manufacturer for the supply of NR. Effective as of December 14, 2022, we entered into an Eighth Amendment (Eighth Amendment) to the Manufacturing and Supply Agreement (such agreement as amended, the "Grace Manufacturing Agreement"), originally effective in January 2016 with Grace. Beginning January 2019, Grace was issued patents related to the manufacturing of the crystalline form of NR. Pursuant to the Eighth Amendment, we are committed to purchase approximately $18.0 million of total inventory during fiscal year 2023, which is our only future purchase commitment with Grace. The Grace Manufacturing Agreement will expire on December 31, 2023, subject to further renewal of the agreement to be negotiated by the parties.

We believe that we have identified reliable sources and suppliers of ingredients, chemicals, phytochemicals and reference materials that will provide products in compliance with our guidelines.

Environmental Compliance

We incur various expenses in complying with Good Manufacturing Practices and safe handling and disposal of materials used in our research and manufacturing activities. For the years ended December 31, 2022 and 2021, these expenses totaled approximately $2.1 million and $1.7 million, respectively. We do not anticipate incurring significant additional expense in our compliance with federal, state and local environmental laws and regulations.

Backlog Orders

For our consumer products segment where we ship products internationally to distributors, we may have a backlog from time to time as the production of Tru Niagen® finished bottles require up to three months lead time by our third-party contract manufacturers. As of December 31, 2022 we did not have any significant backlog orders from the distributors that have not been shipped. For products that are directly shipped to consumers, we have minimal backlog orders as we carry sufficient inventory on hand to ship upon the receipt of order.

For our ingredients segment, we also have minimal backlog orders as we carry sufficient inventory on hand for most of the products we offer and we ship upon the receipt of customer's order.

For our analytical reference standards and services segment, we normally have a small backlog of orders. These orders amount to approximately $20,000 or less. As we list over 1,750 phytochemicals and 400 botanical reference materials in our catalog, we may not always have the items in stock at the time of customers' orders. These backlog orders are normally fulfilled within two to six weeks.

Culture and Workforce

We are a company of curious, talented, and passionate people who are devoted to health, well-being, and improving the way people age. We embrace collaboration and creativity and encourage the iteration of ideas to address complex challenges in all aspects of our business.

We believe our people are critical for our success. We are dedicated to providing an environment where ChromaDex employees can have fulfilling careers, and be happy, healthy and productive. We offer attractive wage and benefit packages to take care of the needs of our employees and their families. Our competitive compensation and dynamic culture help us to attract and retain top candidates. We continue to invest in recruiting and rewarding talented people.

ChromaDex and its employees are dedicated to diversity, inclusion, and fairness. We celebrate personal authenticity and expression as a catalyst to advance human health and innovation. We support healthy, open dialogue and we communicate information about the company through multiple internal channels to our employees. As of December 31, 2022, ChromaDex had 113 full-time employees, none of whom are unionized. We believe relations with our employees are good.

Facilities

For information on our facilities, see "Properties" in Item 2 of this Form 10-K.

Available Information

We are subject to the reporting requirements under the Securities Exchange Act of 1934, as amended (the Exchange Act). Consequently, we are required to file reports and information with the Securities and Exchange Commission (SEC), including reports on the following forms: annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. These reports, proxy and information statements and other information concerning our company may be accessed through the SEC's website at *www.sec.gov*.

You may also find on our website at *www.chromadex.com*, electronic copies of our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. Such filings are placed on our website as soon as reasonably practicable after they are filed with the SEC. All such filings are available free of charge. We also make available, free of charge, on our website our Code of Business Conduct and Ethics, and the Charters of our Audit Committee, Nominating and Corporate Governance Committee, and Compensation Committee of our Board of Directors. Information found on, or accessible through, our website is not a part of, and is not incorporated into, this Annual Report on Form 10-K.

Item 1A. Risk Factors

Investing in our common stock involves a high degree of risk. Current investors and potential investors should consider carefully the risks and uncertainties described below together with all other information contained in this Form 10-K before making investment decisions with respect to our common stock. If any of the following risks occur, our business, financial condition, results of operations and our future growth prospects would likely be materially and adversely affected. Under these circumstances, the trading price and value of our common stock could decline, resulting in a loss of all or part of your investment. The risks and uncertainties described in this Form 10-K are not the only ones facing our Company. Additional risks and uncertainties of which we are not presently aware, or that we currently consider immaterial, may also affect our business operations.

Summary of Risk Factors

We are providing the following summary of the risk factors contained in this Annual Report on Form 10-K to enhance the readability and accessibility of our risk factor disclosures. This summary does not address all of the risks that we face. We encourage our stockholders to carefully review the risk factors contained in this Annual Report on Form 10-K in their entirety for additional information regarding the risks and uncertainties that could cause our actual results to vary materially from recent results or from our anticipated future results.

Risks Related to our Company and Business:

- We have a history of operating losses, may need additional financing to meet our future long-term capital requirements and may be unable to raise sufficient capital on favorable terms or at all.
- Global, market and economic conditions may negatively impact our business, financial condition and share price.
- Interruptions in our relationships or declines in our business with major customers could materially harm our business and financial results.
- Our future success largely depends on sales of our Tru Niagen® product.
- The success of our consumer product and ingredient business is linked to the size and growth rate of the vitamin, mineral and dietary supplement market and an adverse change in the size or growth rate of that market could have a material adverse effect on us.
- The future growth and profitability of our consumer product business will depend in large part upon the effectiveness and efficiency of our marketing efforts and our ability to select effective markets and media in which to market and advertise.
- Many of our competitors are larger and have greater financial and other resources than we do.

Risks Related to our Operations:

- Our operating results may fluctuate significantly as a result of a variety of factors, many of which are outside of our control.
- If we are unable to maintain sales, marketing and distribution capabilities or maintain arrangements with third parties to sell, market and distribute our products, our business may be harmed.
- Our business could be negatively impacted by cyber security incidents or threats, including without limitation a material interruption to our operations including our clinical trials, harm to our reputation, significant fines, penalties and liabilities, regulatory investigations or actions, breach or triggering of data protection laws, privacy policies and data protection obligations, or a loss of revenue, customers or sales.

Risks Related to our Products:

- Unfavorable publicity or consumer perception of our products and any similar products distributed by other companies could have a material adverse effect on our business.
- We may incur material product liability claims or class action litigation, which could increase our costs and adversely affect our reputation, revenues and operating income.
- We rely on single or a limited number of third-party suppliers for the raw materials required to produce our products.
- We utilize ingredients and components for our products from foreign suppliers, and may be negatively affected by the risks associated with international trade and importation issues.

Risks Related to our Intellectual Property:

- Our ability to protect our intellectual property and proprietary technology through patents and other means is uncertain and may be inadequate, which may have a material and adverse effect on us.
- Our patents and licenses may be subject to challenge on validity grounds, and our patent applications may be rejected.
- We may become subject to claims of infringement or misappropriation of the intellectual property rights of others, which could prohibit us from developing our products, require us to obtain licenses from third parties or to develop non-infringing alternatives and subject us to substantial monetary damages.
- We are currently engaged in substantial and complex litigation with Elysium Health, Inc. and Elysium Health LLC (collectively, "Elysium"), the outcome of which could materially harm our business and financial results.

Risks Related to Regulatory Approval of our Products and Other Government Regulations:

- Changes in government regulation or in practices relating to the pharmaceutical, dietary supplement, food and cosmetic industry could decrease the need for the services we provide.
- Compliance with stringent and changing global privacy and data security laws and regulations could result in additional costs and liabilities to us or inhibit our ability to collect and, if applicable, process data globally, and the failure or perceived failure to comply with such laws and regulations could have a material adverse effect on our business, financial condition or results of operations.

Risks Related to the Securities Markets and Ownership of our Equity Securities:

- The market price of our common stock may be volatile and adversely affected by several factors.
- We have not paid cash dividends in the past and do not expect to pay cash dividends in the foreseeable future. Any return on investment may be limited to the value of our common stock.
- We have a significant number of outstanding options and unvested restricted stock units. Future sales of these shares could adversely affect the market price of our common stock.
- We have a limited operating history in China and we face risks with respect to conducting business in connection with our joint venture in China due to certain legal, political, economic and social uncertainties relating to China.
- The COVID-19 pandemic has adversely affected, and may continue to pose risks to, our business, results of operations, financial condition and cash flows, and other epidemics or outbreaks of infectious diseases may have a similar impact.

General Risks:

- We may become involved in securities class action litigation that could divert management's attention and harm our business.
- Our failure to establish and maintain effective internal control over financial reporting could result in material misstatements in our financial statements, result in our failure to meet our reporting obligations and cause investors to lose confidence in our reported financial information, which in turn could cause the trading price of our common stock to decline.

Risks Related to our Company and Business

We have a history of operating losses, may need additional financing to meet our future long-term capital requirements and may be unable to raise sufficient capital on favorable terms or at all.

We have a history of losses and may continue to incur operating and net losses for the foreseeable future. We incurred net losses of approximately $16.5 million and $27.1 million for the years ended December 31, 2022 and 2021, respectively. As of December 31, 2022, our accumulated deficit was approximately $185.5 million. We have not achieved profitability on an annual basis. Our net losses and negative cash flow have had, and will continue to have, an adverse effect on our stockholders' equity and working capital, and if we are not able to achieve and sustain profitability in the near future or at all our stock price may be depressed. We expect to continue to incur increasing expenses as we develop our sales, marketing distribution and other commercial infrastructure and continue to develop and commercializing our products, including the cost of obtaining and maintaining regulatory approvals.

As of December 31, 2022, our cash and cash equivalents totaled approximately $20.4 million of which $20.3 million was unrestricted, and we had no borrowings outstanding under our line of credit up to $10.0 million, subject to certain terms and conditions, with Western Alliance Bank. In the fourth quarter of 2022, we closed two separate securities transactions and received proceeds of approximately $7.7 million, net of offering costs of $0.4 million. However, we may require additional funds, either through additional equity or debt financings, including pursuant to the At Market Issuance Sales Agreement, dated as of June 12, 2020, with B. Riley FBR, Inc. and Raymond James & Associates, Inc. (ATM Facility), or collaborative agreements or from other sources. We have no commitments to obtain such additional financing, and we may not be able to obtain any such additional financing on terms favorable to us, or at all. Further, in recent years as a result of the COVID-19 pandemic, global instability and other factors, the global credit and financial markets have experienced extreme volatility, including diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, high inflation, higher interest rates, increases in unemployment rates and uncertainty about economic stability. There can be no assurance that further deterioration in credit and financial markets and confidence in economic conditions will not occur. If equity and credit markets deteriorate, it may make any necessary debt or equity financing more difficult to obtain, more costly and/or more dilutive. If adequate financing is not available, the Company will further delay, postpone or terminate product and service expansion and curtail certain selling, general and administrative operations. The inability to raise additional financing may have a material adverse effect on the future performance of the Company.

Global, market and economic conditions may negatively impact our business, financial condition and share price.

Concerns over inflation, geopolitical issues, the U.S. financial markets, higher interest rates, foreign exchange rates, capital and exchange controls, unstable global credit markets and financial conditions and the COVID-19 pandemic, have led to periods of significant economic instability, declines in consumer confidence and discretionary spending, diminished expectations for the global economy and expectations of slower global economic growth going forward, and increased unemployment rates. Our general business strategy may be adversely affected by any such economic downturns, volatile business environments and continued unstable or unpredictable economic and market conditions. If these conditions continue to deteriorate or do not improve, it may make any necessary debt or equity financing more difficult to complete, more costly and more dilutive. In addition, there is a risk that one or more of our current or future service providers, manufacturers, suppliers and other partners could be negatively affected by difficult economic times, which could adversely affect our ability to attain our operating goals on schedule and on budget or meet our business and financial objectives.

In addition, we face several risks associated with international business and are subject to global events beyond our control, including war, public health crises, such as pandemics and epidemics, trade disputes, economic sanctions, trade wars and their collateral impacts and other international events. Any of these changes could have a material adverse effect on our reputation, business, financial condition or results of operations. There may be changes to our business if there is instability, disruption or destruction in a significant geographic region, regardless of cause, including war, terrorism, riot, civil insurrection or social unrest; and natural or man-made disasters, including famine, flood, fire, earthquake, storm or disease. In February 2022, armed conflict escalated between Russia and Ukraine. The sanctions announced by the U.S. and other countries, following Russia's invasion of Ukraine against Russia to date include restrictions on selling or importing goods, services or technology in or from affected regions and travel bans and asset freezes impacting connected individuals and political, military, business and financial organizations in Russia. The U.S. and other countries could impose wider sanctions and take other actions should the conflict further escalate. It is not possible to predict the broader consequences of this conflict, which could include further sanctions, embargoes, regional instability, geopolitical shifts and adverse effects on macroeconomic conditions, currency exchange rates and financial markets, all of which could impact our business, financial condition and results of operations.

Interruptions in our relationships or declines in our business with major customers could materially harm our business and financial results.

A.S. Watson Group, a related party, accounted for approximately 13.9% of our sales during the year ended December 31, 2022. Any interruption in our relationship or decline in our business with this customer or other customers upon whom we become highly dependent could cause harm to our business. Factors that could influence our relationship with our customers upon whom we may become highly dependent include:

- our ability to maintain our products at prices and quality that are competitive with those of our competitors, and the potential for new competitors or more aggressive actions by our existing competitors;
- our ability to maintain quality levels for our products sufficient to meet the expectations of our customers;
- our ability to produce, ship and deliver a sufficient quantity of our products in a timely manner to meet the needs of our customers;
- our ability to continue to develop and launch new products that our customers feel meet their needs and requirements, with respect to cost, timeliness, features, performance and other factors;
- our ability to provide timely, responsive and accurate customer support to our customers; and
- the ability of our customers to effectively deliver, market and increase sales of their own products based on ours.

Our future success largely depends on sales of our Tru Niagen® product.

As a consumer-focused company, we expect to generate a significant percentage of our future revenue from sales of our Tru Niagen® product. As a result, the market acceptance of Tru Niagen® is critical to our continued success, and if we are unable to expand market acceptance and increase consumer awareness of Tru Niagen® our business, results of operations, financial condition, liquidity and growth prospects would be materially adversely affected.

The success of our consumer product and ingredient business is linked to the size and growth rate of the vitamin, mineral and dietary supplement market and an adverse change in the size or growth rate of that market could have a material adverse effect on us.

An adverse change in the size or growth rate of the vitamin, mineral and dietary supplement market could have a material adverse effect on our business. Underlying market conditions are subject to change based on economic conditions, consumer preferences and other factors that are beyond our control, including media attention and scientific research, which may be positive or negative.

The future growth and profitability of our consumer product business will depend in large part upon the effectiveness and efficiency of our marketing efforts and our ability to select effective markets and media in which to market and advertise.

Our consumer products business success depends on our ability to attract and retain customers, which significantly depends on our marketing practices. Our future growth and profitability will depend in large part upon the effectiveness and efficiency of our marketing efforts, including our ability to:

- create greater awareness of our brand;
- identify the most effective and efficient levels of spending in each market, media and specific media vehicle;
- determine the appropriate creative messages and media mix for advertising, marketing and promotional expenditures;
- effectively manage marketing costs (including creative and media) to maintain acceptable customer acquisition costs;
- acquire cost-effective television advertising;
- select the most effective markets, media and specific media vehicles in which to market and advertise; and
- convert consumer inquiries into actual orders.

Many of our competitors are larger and have greater financial and other resources than we do.

Our products compete and will compete with other similar products produced by our competitors. These competitive products could be marketed by well-established, successful companies that possess greater financial, marketing, distributional, personnel and other resources than we possess. Using these resources, these companies can implement extensive advertising and promotional campaigns, both generally and in response to specific marketing efforts by competitors, and enter into new markets more rapidly to introduce new products. In certain instances, competitors with greater financial resources also may be able to enter a market in direct competition with us, offering attractive marketing tools to encourage the sale of products that compete with our products or present cost features that consumers may find attractive.

Our material cash requirements will depend on many factors.

Our material cash requirements will depend on many factors, including:

- the revenues generated by sales of our products;
- the costs associated with expanding our sales and marketing efforts, including efforts to hire independent agents and sales representatives;
- our business costs, including increased costs as a result of inflation;
- the expenses we incur in developing and commercializing our products, including the cost of obtaining and maintaining regulatory approvals; and
- unanticipated general and administrative expenses.

Because of these factors, we may seek to raise additional capital within the next twelve months both to meet our projected operating plans after the next twelve months and to fund our longer term strategic objectives. Additional capital may come from public and private equity or debt offerings, borrowings under lines of credit or other sources. These additional funds may not be available on favorable terms, or at all. There can be no assurance we will be successful in raising these additional funds. Furthermore, if we issue equity or debt securities to raise additional funds, our existing stockholders may experience dilution and the new equity or debt securities we issue may have rights, preferences and privileges senior to those of our existing stockholders. In addition, if we raise additional funds through collaboration, licensing or other similar arrangements, it may be necessary to relinquish valuable rights to our products or proprietary technologies, or grant licenses on terms that are not favorable to us. If we cannot raise funds on acceptable terms, we may not be able to develop or enhance our products, obtain the required regulatory clearances or approvals, execute our business plan, take advantage of future opportunities, or respond to competitive pressures or unanticipated customer requirements. Any of these events could adversely affect our ability to achieve our development and commercialization goals, which could have a material and adverse effect on our business, results of operations and financial condition.

Decline in the state of the global economy and financial market conditions could adversely affect our ability to conduct business and our results of operations.

Global economic and financial market conditions, including disruptions in the credit markets and the impact of the global economic deterioration may materially impact our customers and other parties with whom we do business. For example, the COVID-19 pandemic, global instability and other factors have caused the global credit and financial markets to experience extreme volatility, including diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability. These conditions could negatively affect future sales of our consumer products and ingredient lines as consumers may consider the purchase of nutritional products discretionary. Decline in general economic and financial market conditions could materially adversely affect our financial condition and results of operations. Specifically, the impact of these volatile and negative conditions may include decreased demand for our products and services, a decrease in our ability to accurately forecast future product trends and demand, and a negative impact on our ability to timely collect receivables from our customers. The foregoing economic conditions may lead to increased levels of bankruptcies, restructurings and liquidations for our customers, scaling back of research and development expenditures, delays in planned projects and shifts in business strategies for many of our customers. Such events could, in turn, adversely affect our business through loss of sales.

Changes in our business strategy, including entering new consumer product markets, restructuring our businesses or other factors may increase our costs or otherwise affect the profitability of our businesses.

As changes in our business environment occur we may adjust our business strategies to meet these changes or we may otherwise decide to restructure our operations or businesses or assets. In addition, external events including changing technology, changing consumer patterns and changes in macroeconomic conditions, including inflationary pressures, may impair the value of our assets and increase our costs. When these changes or events occur, we may incur costs to change our business strategy and may need to write down the value of assets. In any of these events, our costs may increase, we may have significant charges associated with the write-down of assets or returns on new investments may be lower than prior to the change in strategy or restructuring. For example, we may not be successful in developing our consumer product business for sales of Tru Niagen® products, and our sales may decrease despite us incurring increased costs related to marketing such products.

We face significant competition, including changes in pricing.

The markets for our products and services are both competitive and price sensitive. Many of our competitors have significant financial, operations, sales and marketing resources and experience in research and development. Competitors could develop new technologies that compete with our products and services or even render our products obsolete. If a competitor develops superior technology or cost-effective alternatives to our products and services, our business could be seriously harmed.

The markets for some of our products are also subject to specific competitive risks because these markets are highly price competitive. Our competitors have competed in the past by lowering prices on certain products. If they do so again, we may be forced to respond by lowering our prices. This would reduce sales revenues and increase losses. Failure to anticipate and respond to price competition may also impact sales and aggravate losses. Our commercial opportunity could be reduced if our competitors develop and commercialize products that are more effective or convenient than our products. Our competitors also may obtain regulatory approval for their products in markets we have not yet entered or before we are able to obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter that market.

We believe that customers in our markets display a significant amount of loyalty to their supplier of a particular product. To the extent we are not the first to develop, offer and/or supply new products, customers may buy from our competitors or make materials themselves, causing our competitive position to suffer.

Litigation may harm our business.

Substantial, complex or extended litigation could cause us to incur significant costs and distract our management. For example, lawsuits by employees, stockholders, collaborators, distributors, customers, competitors or others could be very costly and substantially disrupt our business. Disputes from time to time with such companies, organizations or individuals are not uncommon, and we cannot assure you that we will always be able to resolve such disputes on terms favorable to us. As further described in Note 17, *Commitments and Contingencies — Contingencies* in the Notes to the Consolidated Financial Statements, included in Part II, Item 8 of this Annual Report on Form 10-K, we are currently involved in substantial and complex litigation. Unexpected results could cause us to have financial exposure in these matters in excess of recorded reserves and insurance coverage, requiring us to provide additional reserves to address these liabilities, therefore impacting profits.

Our sales and results of operations for our analytical reference standards and services segment depend on our customers' research and development efforts and their ability to obtain funding for these efforts.

Our analytical reference standards and services segment customers include researchers at pharmaceutical and biotechnology companies, chemical and related companies, academic institutions, government laboratories and private foundations. Fluctuations in the research and development budgets of these researchers and their organizations could have a significant effect on the demand for our products. Our customers determine their research and development budgets based on several factors, including the need to develop new products, the availability of governmental and other funding, competition and the general availability of resources. As we continue to expand our international operations, we expect research and development spending levels in markets outside of the United States will become increasingly important to us.

Research and development budgets fluctuate due to changes in available resources, spending priorities, general economic conditions, institutional and governmental budgetary limitations and mergers of pharmaceutical and biotechnology companies. Our business could be harmed by any significant decrease in life science and high technology research and development expenditures by our customers. In particular, a small portion of our sales has been to researchers whose funding is dependent on grants from government agencies such as the United States National Institute of Health, the National Science Foundation, the National Cancer Institute and similar agencies or organizations. Government funding of research and development is subject to the political process, which is often unpredictable. Other departments, such as Homeland Security or Defense, or general efforts to reduce the United States federal budget deficit could be viewed by the government as a higher priority. Any shift away from funding of life science and high technology research and development or delays surrounding the approval of governmental budget proposals may cause our customers to delay or forego purchases of our products and services, which could seriously damage our business.

Some of our customers receive funds from approved grants at a particular time of year, many times set by government budget cycles. In the past, such grants have been frozen for extended periods or have otherwise become unavailable to various institutions without notice. The timing of the receipt of grant funds may affect the timing of purchase decisions by our customers and, as a result, cause fluctuations in our sales and operating results.

Risks Related to our Operations

Our operating results may fluctuate significantly as a result of a variety of factors, many of which are outside of our control.

We are subject to the following factors, among others, that may negatively affect our operating results:

- the announcement or introduction of new products by our competitors;
- our ability to upgrade and develop our systems and infrastructure to accommodate growth;
- the decision by significant customers to reduce purchases;
- increased costs of our raw materials or the development, sales and distribution of our products;
- disputes and litigation;
- our ability to attract and retain key personnel in a timely and cost-effective manner;
- technical difficulties;
- the amount and timing of operating costs and capital expenditures relating to the expansion of our business, operations and infrastructure;
- regulation by federal, state or local governments; and
- general economic conditions as well as economic conditions specific to the nutraceutical industry.

As a result of our limited operating history and the nature of the markets in which we compete, it is extremely difficult for us to make accurate forecasts. We have based our current and future expense levels largely on our investment plans and estimates of future events although certain of our expense levels are, to a large extent, fixed. Assuming our products reach the market, we may be unable to adjust spending in a timely manner to compensate for any unexpected revenue shortfall. Accordingly, any significant shortfall in revenues relative to our planned expenditures would have an immediate adverse effect on our business, results of operations and financial condition. Further, as a strategic response to changes in the competitive environment, we may from time to time make certain pricing, service or marketing decisions that could have a material and adverse effect on our business, results of operations and financial condition. Due to the foregoing factors, our revenues and operating results are and will remain difficult to forecast.

If we are unable to maintain sales, marketing and distribution capabilities or maintain arrangements with third parties to sell, market and distribute our products, our business may be harmed.

To achieve commercial success for our products, we must sell our product lines and/or technologies at favorable prices. In addition to being expensive, maintaining such a sales force is time-consuming. Qualified direct sales personnel with experience in the natural products industry are in high demand, and there can be no assurance that we will be able to hire or retain an effective direct sales team. Similarly, qualified independent sales representatives both within and outside the United States are in high demand, and we may not be able to build an effective network for the distribution of our product through such representatives. There can be no assurance that we will be able to enter into contracts with representatives on terms acceptable to us. Furthermore, there can be no assurance that we will be able to build an alternate distribution framework should we attempt to do so.

We may also need to contract with third parties in order to market our products. To the extent that we enter into arrangements with third parties to perform marketing and distribution services, our product revenue could be lower and our costs higher than if we directly marketed our products. Furthermore, to the extent that we enter into co-promotion or other marketing and sales arrangements with other companies, any revenue received will depend on the skills and efforts of others, and we do not know whether these efforts will be successful. If we are unable to establish and maintain adequate sales, marketing and distribution capabilities, independently or with others, we will not be able to generate product revenue, and may not become profitable.

Our business could be negatively impacted by cyber security threats, including without limitation a material interruption to our operations, harm to our reputation, significant fines, penalties and liabilities, breach or triggering of data protection laws, privacy policies and data protection obligations, or a loss of customers or sales.

In the ordinary course of our business, we may collect, process, store and transmit proprietary, confidential and sensitive information, including personal information (including health information), intellectual property, trade secrets, and proprietary business information owned or controlled by ourselves or other parties. We use our data centers and our networks, and those of third parties, to store and access our proprietary business and other sensitive information. We and the third parties upon which we rely may face various cyber security threats, which are prevalent and continue to increase, including, without limitation, cyber security attacks to our information technology infrastructure and attempts by others to gain access to our proprietary or sensitive information and other similar threats. We rely upon third parties service providers and technologies to operate critical business systems to process confidential and personal information in a variety of contexts, including, without limitation, third-party providers of cloud-based infrastructure, employee email, and other functions. Our ability to monitor these third-party providers information security practices is limited, and these third-parties may not have adequate information security measures in place. Ransomware attacks, including those from organized criminal threat actors, nation-states and nation-state supported actors, are becoming increasingly prevalent and can lead to significant interruptions, delays, or outages in our operations, loss of data, loss of income, significant extra expenses to restore data or systems, reputational loss and the diversion of funds. Similarly, supply-chain attacks have increased in frequency and severity, and we cannot guarantee that third-parties and infrastructure in our supply chain or our third-party partners' supply-chains have not been compromised or that they do not contain exploitable defects or bugs that could result in a breach of or disruption to our information technology systems (including our products/services) or the third-party information technology systems that support us and our services. There may be additional cyber security threats as most of our employees work from home, utilizing network connections outside of the Company premises. Any of the previously identified or similar threats could cause a security incident or other interruption and could result in unauthorized, unlawful, or accidental acquisition, modification, destruction, loss, alteration, encryption, disclosure of, or access to data. A security incident or other interruption could disrupt our ability (and that of third parties upon whom we rely) to provide our products and services. Despite our efforts to identify and remediate vulnerabilities, if any, in our information technology systems (including our products), our efforts may not be successful. Further, we may experience delays in developing and deploying remedial measures designed to address any such identified vulnerabilities.

An actual or perceived cyber security incident could result in disrupted operations, including suspension of our clinical trial activities, lost opportunities, misstated financial data, liability for stolen assets or information, theft of our intellectual property, loss of data and other personally identifiable or sensitive information, increased costs arising from the implementation of additional security protective measures, litigation, reputational damage, government enforcement actions that could include investigations, fines, penalties, audits and inspections, additional reporting requirements and/or oversight, temporary or permanent bans on all or some processing of personal data (which could impact clinical trials), interruptions in our operations (including availability of data) financial loss, and other similar harms. Further, individuals, clinical trial participants or other relevant stakeholders could sue us for our actual or perceived failure to comply with our security obligations, including, without limitation, in class action litigation. We may expend significant resources, fundamentally change our business activities and practices, or modify our operations, including our clinical trial activities, or information technology in an effort to protect against security incidents and to mitigate, detect, and remediate actual and potential vulnerabilities.

Additionally, some applicable federal, state and foreign laws may require companies to notify individuals of security breaches involving particular personally identifiable information, which could result from breaches experienced by us or by our vendors, contractors, or organizations with which we have relationships. Notifications and follow-up actions related to a security breach are costly, and the disclosures or the failure to comply with such requirements could lead to adverse consequences and could impact our reputation or cause us to incur significant costs, including legal expenses and remediation costs.

Any remedial costs or other liabilities related to security incidents may not be fully insured or indemnified by other means. Our contracts may not contain limitations of liability; however, even where they do, there can be no assurance that limitations of liability in our contracts are sufficient to protect us from liabilities, damages, or claims related to our data privacy and security obligations. Although we maintain cyber insurance, we cannot be sure that our insurance coverage will be adequate or sufficient of protect us from or to mitigate liabilities arising out of our privacy and security practices, that such coverage will continue to be available on commercially reasonable terms or at all, or that such coverage will pay future claims.

We may need to increase the size of our organization, and we can provide no assurance that we will successfully expand operations or manage growth effectively.

Our increase in the scope and the scale of our product launches, including entrance into new markets, has resulted in significantly higher operating expenses for increased personnel and fees for regulatory approvals, among other expenses. As a result, we anticipate that our operating expenses will continue to increase. Expansion of our operations may also cause a significant demand on our management, finances and other resources. Our ability to manage the anticipated future growth, should it occur, will depend upon a significant expansion of our accounting and other internal management systems and the implementation and subsequent improvement of a variety of systems, procedures and controls. There can be no assurance that significant problems in these areas will not occur. Any failure to expand these areas and implement and improve such systems, procedures and controls in an efficient manner at a pace consistent with our business could have a material adverse effect on our business, financial condition and results of operations. There can be no assurance that our attempts to expand our marketing, sales, manufacturing and customer support efforts will be successful or will result in additional sales or profitability in any future period. As a result of the expansion of our operations and the anticipated increase in our operating expenses, as well as the difficulty in forecasting revenue levels, we expect to continue to experience significant fluctuations in our results of operations.

The insurance industry has become more selective in offering some types of coverage and we may not be able to obtain insurance coverage in the future.

The insurance industry has become more selective in offering some types of insurance in recent years, such as product liability, product recall, property and directors' and officers' liability insurance. Our current insurance program is consistent with both our past level of coverage and our risk management policies. However, we cannot assure you that we will be able to obtain comparable insurance coverage on favorable terms, or at all, in the future. Certain of our customers as well as prospective customers require that we maintain minimum levels of coverage for our products. Lack of coverage or coverage below these minimum required levels could cause these customers to materially change business terms or to cease doing business with us entirely.

We may bear financial risk if we underprice our contracts or overrun cost estimates.

In cases where our contracts are structured as fixed price or fee-for-service with a cap, we bear the financial risk if we initially underprice our contracts or otherwise overrun our cost estimates. Such underpricing or significant cost overruns could have a material adverse effect on our business, results of operations, financial condition and cash flows.

We depend on key personnel, the loss of any of which could negatively affect our business.

We depend greatly on the services of Robert Fried, Brianna Gerber and Heather Van Blarcom who are our Chief Executive Officer, Chief Financial Officer and Senior Vice President of Legal and Corporate Secretary, respectively. We also depend greatly on other key employees, including key scientific and marketing personnel. In general, only highly qualified and trained scientists have the necessary skills to develop our products and provide our services. Only marketing personnel with specific experience and knowledge in health care are able to effectively market our products. In addition, some of our manufacturing, quality control, safety and compliance, information technology, sales and e-commerce related positions are highly technical as well. We face intense competition for these professionals from our competitors, customers, marketing partners and other companies throughout the industries in which we compete. Our success will depend, in part, upon our ability to attract and retain additional skilled personnel, which will require substantial additional funds. There can be no assurance that we will be able to find and attract additional qualified employees or retain any such personnel. Our inability to hire qualified personnel, the loss of services of our key personnel, or the loss of services of executive officers or key employees that may be hired in the future may have a material and adverse effect on our business.

We may not be successful in acquiring complementary businesses or products on favorable terms or entry into joint venture or similar arrangements.

As part of our business strategy, we intend to consider acquisitions of similar or complementary businesses or products. No assurance can be given that we will be successful in identifying attractive acquisition candidates or completing acquisitions, joint ventures or other arrangements on favorable terms. In addition, any future acquisitions will be accompanied by the risks commonly associated with acquisitions. These risks include potential exposure to unknown liabilities of acquired companies or to acquisition costs and expenses, the difficulty and expense of integrating the operations and personnel of the acquired companies, the potential disruption to the business of the combined company and potential diversion of our management's time and attention, the impairment of relationships with and the possible loss of key employees and clients as a result of the changes in management, the incurrence of amortization expenses and write-downs and dilution to the shareholders of the combined company if the acquisition is made for stock of the combined company. In addition, successful completion of an acquisition may depend on consents from third parties, including regulatory authorities and private parties, which consents are beyond our control. If we enter into future joint ventures or other collaborative arrangements, disruptions in our relationships with our collaborators could also impact the success of our joint venture, and the anticipated benefits may not materialize. There can be no assurance that products, technologies or businesses of acquired companies will be effectively assimilated into the business or product offerings of the combined company or will have a positive effect on the combined company's revenues or earnings. Further, the combined company may incur significant expense to complete acquisitions and to support the acquired products and businesses. Any such acquisitions may be funded with cash, debt or equity, which could have the effect of diluting or otherwise adversely affecting the holdings or the rights of our existing stockholders.

If we experience a significant disruption in our information technology systems or if we fail to implement new systems and software successfully, our business could be adversely affected.

We depend on information systems throughout our company, as well as those of our contractors, consultants, vendors and other third parties, to control our manufacturing processes, process orders, manage inventory, process and bill shipments and collect cash from our customers, respond to customer inquiries, contribute to our overall internal control processes, maintain records of our property, plant and equipment, and record and pay amounts due vendors and other creditors. Most of our employees have been working remotely from home and we have depended on communication tools and remote connections to our information technology systems to conduct business virtually. If we were to experience a prolonged disruption in our information systems that involve interactions amongst employees as well as with customers and suppliers, it could result in the loss of sales and customers and/or increased costs, which could adversely affect our overall business operation.

We are subject to financial and operating covenants in our business financing agreement with Western Alliance Bank, as amended (Credit Agreement) and any failure to comply with such covenants, or obtain waivers in the event of non-compliance, could limit our borrowing availability under the Credit Agreement, resulting in our being unable to borrow under the Credit Agreement and materially adversely impact our liquidity. In addition, our operations may not provide sufficient cash to meet the repayment obligations of debt incurred under the Credit Agreement.

The Credit Agreement contains affirmative and restrictive covenants, including covenants regarding delivery of financial statements, maintenance of inventory, payment of taxes, maintenance of insurance, dispositions of property, business combinations or acquisitions and incurrence of additional indebtedness, among other customary covenants, in each case subject to limited exceptions.

There can be no assurance that we will be able to comply with the financial and other covenants in the Credit Agreement. Our failure to comply with these covenants could cause us to be unable to borrow under the Credit Agreement and may constitute an event of default which, if not cured or waived, could result in the acceleration of the maturity of any indebtedness then outstanding under the Credit Agreement, which would require us to pay all amounts then outstanding. If we are unable to repay those amounts, Western Alliance Bank could proceed against the collateral granted to them to secure that debt, which would seriously harm our business. Such an event could materially adversely affect our financial condition and liquidity. Additionally, such events of non-compliance could impact the terms of any additional borrowings and/or any credit renewal terms. Any failure to comply with such covenants may be a disclosable event and may be perceived negatively. Such perception could adversely affect the market price for our common stock and our ability to obtain financing in the future.

Risks Related to Our Products

Unfavorable publicity or consumer perception of our products and any similar products distributed by other companies could have a material adverse effect on our business.

We believe the nutritional supplement market is highly dependent upon consumer perception regarding the safety, efficacy and quality of nutritional supplements generally, as well as of products distributed specifically by us. Consumer perception of our products can be significantly influenced by scientific research or findings, regulatory investigations, litigation, national media attention, social media and other publicity regarding the consumption of nutritional supplements. We cannot assure you that future scientific research, findings, regulatory proceedings, litigation, media attention or other research findings or publicity will be favorable to the nutritional supplement market or any product, or consistent with earlier publicity. Future research reports, findings, regulatory proceedings, litigation, media attention or other publicity that are perceived as less favorable than, or that question, such earlier research reports, findings or publicity could have a material adverse effect on the demand for our products and consequently on our business, results of operations, financial condition and cash flows.

Our dependence upon consumer perceptions means that adverse scientific research reports, findings, regulatory proceedings, litigation, media attention or other publicity, if accurate or with merit, could have a material adverse effect on the demand for our products, the availability and pricing of our ingredients, and our business, results of operations, financial condition and cash flows. Further, adverse public reports or other media attention regarding the safety, efficacy and quality of nutritional supplements in general, or our products specifically, or associating the consumption of nutritional supplements with illness, could have such a material adverse effect. Even media attention that is immaterial or inaccurate can have an impact on our sales or financial results if widely disseminated to our customers. Any such adverse public reports or other media attention could arise even if the adverse effects associated with such products resulted from consumers' failure to consume such products appropriately or as directed and the content of such public reports and other media attention may be beyond our control.

We may incur material product liability claims or class action litigation, which could increase our costs and adversely affect our reputation, revenues and operating income.

As a consumer product and ingredient supplier we market and manufacture products designed for human and animal consumption. We are subject to product liability claims if the use of our products is alleged to have resulted in injury. Our products consist of ingredients classified as dietary supplements, or natural health products, and, in most cases, are not subject to pre-market regulatory approval in the United States. Some of our products contain innovative ingredients that do not have long histories of human consumption. Previously unknown adverse reactions resulting from human consumption of these ingredients could occur. In addition, the products we sell are produced by third-party manufacturers. As a marketer of products manufactured by third parties, we also may be liable for various product liability claims for products we do not manufacture. We have, and may in the future, be subject to various product liability claims, including, among others, that our products include inadequate instructions for use or inadequate warnings concerning possible side effects and interactions with other substances. A product liability claim or class action litigation against us could result in increased costs and could adversely affect our reputation with our customers, which, in turn, could have a materially adverse effect on our business, results of operations, financial condition and cash flows.

We rely on single or a limited number of third-party suppliers for the raw materials required to produce our products.

Our dependence on a limited number of third-party suppliers or on a single supplier, and the challenges we may face in obtaining adequate supplies of raw materials, involve several risks, including limited control over pricing, availability, health epidemics affecting the region of such suppliers (including the coronavirus), quality and delivery schedules. We cannot be certain that our current suppliers will continue to provide us with the quantities of these raw materials that we require or satisfy our anticipated specifications and quality requirements. Due to COVID-19 and other worldwide macroeconomic conditions such as, but not limited to, geopolitical conflicts and unrest, labor shortages, port congestion, and government restrictions there may be delays in shipments from our suppliers. Any supply interruption in limited or sole sourced raw materials could materially harm our ability to manufacture our products until a new source of supply, if any, could be identified and qualified. We may be unable to find a sufficient alternative supply channel in a reasonable time or on commercially reasonable terms. Any performance failure on the part of our suppliers could delay the development and commercialization of our products, or interrupt production of then existing products that are already marketed, which would have a material adverse effect on our business. For example, W.R. Grace & Co.-Conn. (Grace) is the exclusive manufacturer to us for the supply of NR. There is no guarantee that we will be able to continue to contract with Grace for the supply of NR, or that such terms will be favorable to us.

We utilize ingredients and components for our products from foreign suppliers, and may be negatively affected by the risks associated with international trade and importation issues.

We utilize ingredients and components for a number of our products from suppliers outside of the United States. Accordingly, the acquisition of these ingredients is subject to the risks generally associated with importing raw materials, including, among other factors, delays in shipments, changes in economic and political conditions, supply chain disruptions, quality assurance, health epidemics affecting the region of such suppliers, including COVID-19, global instability, nonconformity to specifications or laws and regulations, tariffs, trade and/or labor disputes and foreign currency fluctuations. While we have a supplier certification program and audit and inspect our suppliers' facilities as necessary both in the United States and internationally, we cannot assure you that raw materials received from suppliers outside of the United States will conform to all specifications, laws and regulations. There have in the past been quality and safety issues in our industry with certain items imported from overseas. We may incur additional expenses and experience shipment delays due to preventative measures adopted by the U.S. governments, our suppliers and our company.

We may never develop any additional products to commercialize.

We have invested a substantial amount of our time and resources in developing various new products. Commercialization of these products will require additional development, clinical evaluation, regulatory approval, significant marketing efforts and substantial additional investment before they can provide us with any revenue. Despite our efforts, these products may not become commercially successful products for a number of reasons, including but not limited to:

- we may not be able to obtain regulatory approvals for our products, or the approved indication may be narrower than we seek;
- our products may not prove to be safe and effective in clinical trials;
- we may experience delays in our development program;
- any products that are approved may not be accepted in the marketplace;
- we may not have adequate financial or other resources to complete the development or to commence the commercialization of our products or will not have adequate financial or other resources to achieve significant commercialization of our products;
- we may not be able to manufacture any of our products in commercial quantities or at an acceptable cost;
- rapid technological change may make our products obsolete;
- we may be unable to effectively protect our intellectual property rights or we may become subject to claims that our activities have infringed the intellectual property rights of others; and
- we may be unable to obtain or defend patent rights for our products.

We may not be able to partner with others for technological capabilities and new products and services.

Our ability to remain competitive may depend, in part, on our ability to continue to seek partners that can offer technological improvements and improve existing products and services that are offered to our customers. We are committed to attempting to keep pace with technological change, to stay abreast of technology changes and to look for partners that will develop new products and services for our customer base. We cannot assure prospective investors that we will be successful in finding partners or be able to continue to incorporate new developments in technology, to improve existing products and services, or to develop successful new products and services, nor can we be certain that newly developed products and services will perform satisfactorily or be widely accepted in the marketplace or that the costs involved in these efforts will not be substantial.

If we fail to maintain adequate quality standards for our products and services, our business may be adversely affected and our reputation harmed.

Dietary supplement, nutraceutical, food and beverage, functional food, analytical laboratories, pharmaceutical and cosmetic customers are often subject to rigorous quality standards to obtain and maintain regulatory approval of their products and the manufacturing processes that generate them. A failure to maintain, or, in some instances, upgrade our quality standards to meet our customers' needs, could cause damage to our reputation and potentially result in substantial sales losses.

If we experience product recalls, we may incur significant and unexpected costs, and our business reputation could be adversely affected.

We may be exposed to product recalls and adverse public relations if our products are alleged to be mislabeled or to cause injury or illness, or if we are alleged to have violated governmental regulations. A product recall could result in substantial and unexpected expenditures, which would reduce operating profit and cash flow. In addition, a product recall may require significant management attention. Product recalls may hurt the value of our brands and lead to decreased demand for our products. Product recalls also may lead to increased scrutiny by federal, state or international regulatory agencies of our operations and increased litigation and could have a material adverse effect on our business, results of operations, financial condition and cash flows.

Demand for our products and services are subject to the commercial success of our customers' products, which may vary for reasons outside our control.

Even if we are successful in securing utilization of our products in a customer's manufacturing process, sales of many of our products and services remain dependent on the timing and volume of the customer's production, over which we have no control. The demand for our products depends on regulatory approvals and/or notifications and frequently depends on the commercial success of the customer's supported product. Regulatory processes are complex, lengthy, expensive, and can often take years to complete.

Risks Related to our Intellectual Property

Our ability to protect our intellectual property and proprietary technology through patents and other means is uncertain and may be inadequate, which may have a material and adverse effect on us.

Our success depends significantly on our ability to protect our proprietary rights to the technologies used in our products. We rely on patent protection, as well as a combination of copyright, trade secret and trademark laws and nondisclosure, confidentiality and other contractual restrictions to protect our proprietary technology, including our licensed technology. However, these legal means afford only limited protection and may not adequately protect our rights or permit us to gain or keep any competitive advantage. For example, our pending United States and foreign patent applications may not issue as patents in a form that will be advantageous to us or may issue and be subsequently successfully challenged by others and invalidated. In addition, our pending patent applications include claims to material aspects of our products and procedures that are not currently protected by issued patents. Both the patent application process and the process of managing patent disputes can be time consuming and expensive. Competitors may be able to design around our patents or develop products which provide outcomes which are comparable or even superior to ours. Steps that we have taken to protect our intellectual property and proprietary technology, including entering into confidentiality agreements and intellectual property assignment agreements with some of our officers, employees, consultants and advisors, may not provide us with meaningful protection for our trade secrets or other proprietary information in the event of unauthorized use or disclosure or other breaches of the agreements. Furthermore, the laws of foreign countries may not protect our intellectual property rights to the same extent as do the laws of the United States.

In the event a competitor infringes our licensed or pending patent or other intellectual property rights, enforcing those rights may be costly, uncertain, difficult and time consuming. Even if successful, litigation to enforce our intellectual property rights or to defend our patents against challenge could be expensive and time consuming and could divert our management's attention. We may not have sufficient resources to enforce our intellectual property rights or to defend our patents rights against a challenge. The failure to obtain patents and/or protect our intellectual property rights could have a material and adverse effect on our business, results of operations and financial condition.

Our patents and licenses may be subject to challenge on validity grounds, and our patent applications may be rejected.

We rely on our patents, patent applications, licenses and other intellectual property rights to give us a competitive advantage. Whether a patent is valid, or whether a patent application should be granted, is a complex matter of science and law, and therefore we cannot be certain that, if challenged, our patents, patent applications and/or other intellectual property rights would be upheld nor can we be certain we will prevail in an appeal. If one or more of those patents, patent applications, licenses and other intellectual property rights are invalidated, rejected or found unenforceable and we are unable to reverse that finding through an appeal, that could reduce or eliminate any competitive advantage we might otherwise have had.

We may become subject to claims of infringement or misappropriation of the intellectual property rights of others, which could prohibit us from developing our products, require us to obtain licenses from third parties or to develop non-infringing alternatives and subject us to substantial monetary damages.

Third parties could, in the future, assert infringement or misappropriation claims against us with respect to products we develop. Whether a product infringes a patent or misappropriates other intellectual property involves complex legal and factual issues, the determination of which is often uncertain. Therefore, we cannot be certain that we have not infringed the intellectual property rights of others. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for use related to the use or manufacture of our products, and our potential competitors may assert that some aspect of our product infringes their patents. Because patent applications may take years to issue, there also may be applications now pending of which we are unaware that may later result in issued patents upon which our products could infringe. There also may be existing patents or pending patent applications of which we are unaware upon which our products may inadvertently infringe.

Any infringement or misappropriation claim could cause us to incur significant costs, place significant strain on our financial resources, divert management's attention from our business and harm our reputation. If the relevant patents in such claim were upheld as valid and enforceable and we were found to infringe them, we could be prohibited from manufacturing or selling any product that is found to infringe unless we could obtain licenses to use the technology covered by the patent or are able to design around the patent. We may be unable to obtain such a license on terms acceptable to us, if at all, and we may not be able to redesign our products to avoid infringement, which could materially impact our revenue. A court could also order us to pay compensatory damages for such infringement, plus prejudgment interest and could, in addition, treble the compensatory damages and award attorney fees. These damages could be substantial and could harm our reputation, business, financial condition and operating results. A court also could enter orders that temporarily, preliminarily or permanently enjoin us and our customers from making, using, or selling products, and could enter an order mandating that we undertake certain remedial activities. Depending on the nature of the relief ordered by the court, we could become liable for additional damages to third parties.

We are currently engaged in substantial and complex litigation with Elysium Health, Inc. and Elysium Health LLC (collectively, "Elysium"), the outcome of which could materially harm our business and financial results.

The litigation includes multiple complaints and counterclaims by us and Elysium in venues in California and New York, as well as a patent infringement complaint filed by the Company and Trustees of Dartmouth College. For further details on this litigation, please refer to Note 17, Commitments and Contingencies — Legal Proceedings in the Notes to the Consolidated Financial Statements, included in Item 8 of Part II of this Annual Report on Form 10-K.

The litigation is substantial and complex, and it has caused and could continue to cause us to incur significant costs, as well as distract our management over an extended period. The litigation may substantially disrupt our business and we cannot assure you that we will be able to resolve the litigation on terms favorable to us. If we are unsuccessful in resolving the litigation on favorable terms to us, we may be forced to pay compensatory and punitive damages and restitution for any royalty payments that we received from Elysium, which payments could materially harm our business, or be subject to other remedies, including injunctive relief. We cannot predict the outcome of our litigation with Elysium, which could have any of the results described above or other results that could materially adversely affect our business.

The prosecution and enforcement of patents licensed to us by third parties are not within our control. Without these technologies, our products may not be successful and our business would be harmed if the patents were infringed on or misappropriated without action by such third parties.

We have obtained licenses from third parties for patents and patent application rights related to ingredients and/or the products we are developing, allowing us to use intellectual property rights owned by or licensed to these third parties. We do not control the maintenance, prosecution, enforcement or strategy for many of these patents or patent application rights and as such are dependent in part on the owners of the intellectual property rights to maintain their viability. If any third-party licensor is unable to successfully maintain, prosecute or enforce the licensed patents and/or patent application rights related to our products, we may become subject to infringement or misappropriate claims or lose our competitive advantage. Without access to these technologies or suitable design-around or alternative technology options, our ability to conduct our business could be impaired significantly.

We may be subject to damages resulting from claims that we, our employees, or our independent contractors have wrongfully used or disclosed alleged trade secrets of others.

Some of our employees were previously employed at other dietary supplement, nutraceutical, food and beverage, functional food, analytical laboratories, pharmaceutical and cosmetic companies. We may also hire additional employees who are currently employed at other such companies, including our competitors. Additionally, consultants or other independent agents with which we may contract may be or have been in a contractual arrangement with one or more of our competitors. We may be subject to claims that these employees or independent contractors have used or disclosed such other party's trade secrets or other proprietary information. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to our management. If we fail to defend such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. A loss of key personnel or their work product could hamper or prevent our ability to market existing or new products, which could severely harm our business.

Risks Related to Regulatory Approval of Our Products and Other Government Regulations

Changes in government regulation or in practices relating to the pharmaceutical, dietary supplement, food and cosmetic industry could decrease the need for the services we provide.

Governmental agencies throughout the world, including in the United States, strictly regulate the pharmaceutical, dietary supplement, food and cosmetic industries. Changes in regulation, such as a relaxation in regulatory requirements or the introduction of simplified drug approval procedures, or an increase in regulatory requirements that we have difficulty satisfying or that make our services less competitive, could eliminate or substantially reduce the demand for our services. Also, if the government makes efforts to contain drug costs and pharmaceutical and biotechnology company profits from new drugs, or if health insurers were to change their practices with respect to reimbursements for pharmaceutical products, our customers may spend less, or reduce their spending on research and development.

Compliance with stringent and changing global privacy and data security laws and regulations could result in additional costs and liabilities to us or inhibit our ability to collect and, if applicable, process data globally, and the failure or perceived failure to comply with such laws and regulations could have a material adverse effect on our business, financial condition or results of operations.

We collect, receive, store, process, use, generate, transfer, disclose, make accessible, protect and share personal information and other sensitive information, including but not limited to proprietary and confidential business information, trade secrets, intellectual property, information collected about patients in connection with clinical trials and sensitive third-party information necessary to operate our business, for legal and marketing purposes. Accordingly, we are, or may become, subject to numerous federal, state, local, and foreign data privacy and security laws, regulations, guidance and industry standards as well as external and internal privacy and security policies, contracts and other obligations that apply to the processing of personal data by us and on our behalf. The legal framework for the collection, use, safeguarding, sharing, transfer and other processing of information worldwide is rapidly evolving and may remain unsettled for the foreseeable future.

Outside the United States, an increasing number of laws, regulations, and industry standards apply to data privacy and security. For example, the European Union's General Data Protection Regulation (GDPR) and the United Kingdom's GDPR (UK GDPR) imposes strict obligations on the processing of personal data, including, without limitation, and personal health data. The GDPR and UK GDPR set out extensive compliance requirements, including providing detailed disclosures about how personal data is collected and processed, demonstrating that an appropriate legal basis is in place or otherwise exists to justify data processing activities; granting new rights for data subjects in regard to their personal data, as well as enhancing pre-existing rights (e.g., data subject access requests); requiring the appointment of a data protection officer in certain circumstances; mandating the appointment of representatives in the United Kingdom and/or the EEA in certain circumstances; introducing the obligation to notify data protection regulators or supervisory authorities (and in certain cases, affected individuals) of significant data breaches; imposing limitations on retention of personal data; maintaining a record of data processing; and complying with the principle of accountability and the obligation to demonstrate compliance through policies, procedures, training and audit. The processing of sensitive personal data, such as health information, impose heightened compliance burdens under the GDPR and the UK Data Protection Act and is a topic of active interest among foreign regulators. Moreover, the GDPR and the UK Data Protection Act increase obligations with respect to clinical trials conducted in the EU and the UK by expanding the definition of personal data to include coded data and requiring changes to informed consent practices and more detailed notices for clinical trial participants and investigators.

Legal developments in Europe have created complexity and uncertainty regarding transfers of personal data from the European Economic Area, or EEA, to the United States. On July 16, 2020, in a case known as Schrems II, the Court of Justice of the European Union, or CJEU, invalidated the EU-US Privacy Shield Framework under which personal data could be transferred from the EEA to U.S. entities who had self-certified under the Privacy Shield scheme. While the CJEU upheld the adequacy of the Standard Contractual Clauses (a standard form of contract approved by the European Commission as an adequate personal data transfer mechanism, and potential alternative to the Privacy Shield), it made clear that reliance on them alone may not necessarily be sufficient in all circumstances. Use of the standard contractual clauses must now be assessed on a case-by-case basis taking into account the legal regime applicable in the destination country, in particular applicable surveillance laws and rights of individuals and additional measures and/or contractual provisions may need to be put in place. Additionally, new Standard Contractual Clauses that repealed the Standard Contractual Clauses adopted under the Data Protection Directive were adopted on June 4, 2021 by the European Commission. We thus are still in the process of updating all our contracts entailing the transfer of personal data outside of the European Economic Area with this new Standard Contractual Clauses. As supervisory authorities issue further guidance on personal data export mechanisms, including on the new Standard Contractual Clauses, and/or start taking enforcement action, we could suffer additional costs, complaints and/or regulatory investigations or fines, and/or if we or third parties we work with are otherwise unable to transfer personal data between and among countries and regions in which clinical trials of our products are conducted, it could affect our business. The President of the United States and the President of the European Commission announced on March 25, 2022 that they had reached an agreement in principle for a Trans-Atlantic Data Privacy Framework, which would allow personal data to flow freely and safely between the EU and participating U.S. companies. On October 7, 2022, the President of the United States signed an Executive Order directing the steps that the United States will take to implement the U.S. commitments under the European Union-U.S. Data Privacy Framework (EU-U.S. DPF). The Executive Order includes the adoption, by the United States, of a new set of rules and binding safeguards to limit access to data by U.S. intelligence authorities and procedures to ensure effective oversight of new privacy and civil liberties standards, as well as the implementation of a new two-tier redress system to investigate and resolve complaints by European citizens on access of data by U.S. Intelligence authorities. The Executive Order further calls on the Privacy and Civil Liberties Oversight Board to review Intelligence Community policies and procedures to ensure that they are consistent with the Executive Order and to conduct an annual review of the redress process. In connection with the signing of this Executive Order and the directives contained therein, the European Commission has the basis to adopt an adequacy decision, which involves a proposal from the European Commission, an opinion of the European Data Protection Board, an approval from representatives of EU countries, and the adoption of the decision by the European Commission. Accordingly, the new Trans-Atlantic Data Privacy Framework may not be adopted in a near future and thus, the transfer of personal data from the EU to the United States still entail in-depth legal analysis and heavy paperwork requirements until then.

Relatedly, following the United Kingdom's withdrawal from the EEA and the EU, we also have to comply with the UK-specific requirements related to data protection, including with respect to transfer of personal data outside of the UK, which increases our regulatory compliance burden. The UK updated its transfer mechanism and we will need to update all of our contracts entailing the transfer of personal data outside of the United Kingdom with this new UK-specific transfer tools.

If we cannot implement a valid compliance mechanism for cross-border data transfers, we may face increased exposure to regulatory actions, substantial fines, and injunctions against processing or transferring personal data from Europe or elsewhere. The inability to import personal data to the United States could significantly and negatively impact our business operations, including by limiting our ability to collaborate with parties that are subject to European and other data privacy and security laws; or requiring us to increase our personal data processing capabilities and infrastructure in Europe and/or elsewhere at significant expense.

Additionally, in the United States, federal, state, and local governments have enacted numerous data privacy and security laws, including data breach notification laws, personal data privacy laws, and consumer protection laws. The California Consumer Privacy Act of 2018 (CCPA) imposes obligations including, but not limited to, providing specific disclosures in privacy notices and affording California residents certain rights related to their personal data with statutory fines for noncompliance. The California Privacy Rights Act of 2020 (CPRA), effective January 1, 2023, will among other changes, establish a new California Privacy Protection Agency to implement and enforce the CPRA, which could increase the risk of an enforcement action. Other states have enacted data privacy laws. For example, Virginia passed the Consumer Data Protection Act, Colorado passed the Colorado Privacy Act, Connecticut passed the Connecticut Data Privacy Act and Utah passed the Utah Consumer Privacy Act all four of which differ from the CPRA and become effective in 2023. Each of these state laws adds potential compliance and risk for us with respect to data necessary to operate our business.

A United States federal privacy bill advanced to the U.S. House of Representatives on July 20, 2022, which has been amended as of December 30, 2022, and recommended for passage as law, would establish new requirements for how companies handle personal data, including information that identifies or is reasonably linked to an individual, such as our consumers. If this bill becomes law, we may be required to implement certain security practices to protect and secure personal data against unauthorized access, and we may be subject to further requirements for complying with this requirement if the FTC issues related regulations. Additionally, if we become subject to new data privacy laws, at the state level, the risk of enforcement action against us could increase because we may become subject to additional obligations, and the number of individuals or entities that can initiate actions against us may increase (including individuals, via a private right of action, and state actors).Other data privacy and security laws have been proposed at the federal, state, and local levels in recent years, which could further complicate compliance efforts.

Our obligations related to data privacy and security are quickly changing in an increasingly stringent fashion, creating some uncertainty as to the effective future legal framework. Additionally, these obligations may be subject to differing applications and interpretations, which may be inconsistent or in conflict among jurisdictions. Preparing for and complying with these obligations requires us to devote significant resources (including, without limitation, financial and time-related resources). These obligations may necessitate changes to our information technologies, systems, and practices and to those of any third parties that process personal data on our behalf. In addition, these obligations may require us to change our business model. Collectively, these laws may increase our compliance costs and potential liability. Although we endeavor to comply with our published policies, other documentation, and all applicable privacy and security laws, we may at times fail to do so or may be perceived to have failed to do so. Moreover, despite our efforts, our personnel or third parties upon whom we rely may fail to comply with such obligations, which could negatively impact our business operations and compliance posture. For example, any failure by a third-party processor to comply with applicable law, regulations, or contractual obligations could result in adverse effects, including inability to operate our business and proceedings against us by governmental entities or others. If we fail, or are perceived to have failed, to address or comply with obligations related to data privacy and security, we could face government enforcement actions that could include investigations, fines, penalties, audits and inspections; additional reporting requirements and/or oversight; temporary or permanent bans on all or some processing of personal data; orders to destroy or not use personal data; and imprisonment of company officials. Further, individuals or other relevant stakeholders could sue us for our actual or perceived failure to comply with our data privacy and security obligations, including, without limitation, in class action litigation. Any of these events could have a material adverse effect on our reputation, business, or financial condition, and could lead to a loss of actual or prospective customers, collaborators or partners; result in an inability to process personal data or to operate in certain jurisdictions; limit our ability to develop or commercialize our products; or require us to revise or restructure our operations. Moreover, such suits, even if we are not found liable, could be expensive and time-consuming to defend and could result in adverse publicity that could harm our business or have other material adverse effects. Additionally, we expect that there will continue to be new proposed laws and regulations concerning data privacy and security, and we cannot yet determine the impact such future laws, regulations and standards may have on our business.

We are subject to regulation by various federal, state and foreign agencies that require us to comply with a wide variety of regulations, including those regarding the manufacture of products, advertising and product label claims, the distribution of our products and environmental matters. Failure to comply with these regulations could subject us to fines, penalties and additional costs.

Some of our operations are subject to regulation by various United States federal agencies and similar state and international agencies, including the Department of Commerce, the FDA, the FTC, the Department of Transportation and the Department of Agriculture. These regulations govern a wide variety of product activities, from design and development to labeling, manufacturing, handling, sales and distribution of products. If we fail to comply with any of these regulations, we may be subject to fines or penalties, have to recall products and/or cease their manufacture and distribution, which would increase our costs and reduce our sales.

We are also subject to various federal, state, local and international laws and regulations that govern the handling, transportation, manufacture, use and sale of substances that are or could be classified as toxic or hazardous substances. Some risk of environmental damage is inherent in our operations and the products we manufacture, sell, or distribute. In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. Current or future environmental laws and regulations may impair our research, development or production efforts. In addition, failure to comply with these laws and regulations may result in substantial fines, penalties or other sanctions. Any failure by us to comply with the applicable government regulations could also result in product recalls or impositions of fines and restrictions on our ability to carry on with or expand in a portion or possibly all of our operations. If we fail to comply with any or all of these regulations, we may be subject to fines or penalties, have to recall products and/or cease their manufacture and distribution, which would increase our costs and reduce our sales.

Government regulations of our customer's business are extensive and are constantly changing. Changes in these regulations can significantly affect customer demand for our products and services.

The process by which our customers' industries are regulated is controlled by government agencies and depending on the market segment can be very expensive, time consuming, and uncertain. Changes in regulations or the enforcement practices of current regulations could have a negative impact on our customers and, in turn, our business. At this time, it is unknown how the FDA will interpret and to what extent it will enforce Good Manufacturing Practices, and other regulations that will likely affect many of our customers. These uncertainties may have a material impact on our results of operations, as lack of enforcement or an interpretation of the regulations that lessens the burden of compliance for the dietary supplement marketplace may cause a reduced demand for our products and services.

If we should in the future become required to obtain regulatory approval to market and sell our goods we will not be able to generate any revenues until such approval is received.

The nutraceutical industry is subject to stringent regulation by a wide range of authorities. While we believe that, given our present business, we are not currently required to obtain regulatory approval to market our goods because, among other things, we do not (i) produce or market any clinical devices or other products, or (ii) sell any medical products or services to the customer, we cannot predict whether regulatory clearance will be required in the future and, if so, whether such clearance will at such time be obtained for any products that we are developing or may attempt to develop. Should such regulatory approval in the future be required, our goods may be suspended or may not be able to be marketed and sold in the United States until we have completed the regulatory clearance process as and if implemented by the FDA. Satisfaction of regulatory requirements typically takes many years, is dependent upon the type, complexity and novelty of the product or service and would require the expenditure of substantial resources.

If regulatory clearance of a good that we propose to market and sell is granted, this clearance may be limited to those particular states and conditions for which the good is demonstrated to be safe and effective, which would limit our ability to generate revenue. We cannot ensure that any good that we develop will meet all of the applicable regulatory requirements needed to receive marketing clearance. Failure to obtain regulatory approval will prevent commercialization of our goods where such clearance is necessary. There can be no assurance that we will obtain regulatory approval of our proposed goods that may require it.

Risks Related to the Securities Markets and Ownership of our Equity Securities

The market price of our common stock may be volatile and adversely affected by several factors.

The market price of our common stock could fluctuate significantly in response to various factors and events, including, but not limited to:

- our ability to develop and commercialize our products;
- our ability to integrate operations, technology, products and services;
- our ability to execute our business plan;
- our operating results are below expectations;
- our issuance of additional securities, including debt or equity or a combination thereof,;
- announcements of technological innovations or new products by us or our competitors;
- acceptance of and demand for our products by consumers;
- media coverage or social media attention regarding our industry or us;
- litigation, arbitration, or other adverse non-judicial proceedings;
- disputes with or our inability to collect from significant customers;
- loss of any strategic relationship;
- industry developments, including, without limitation, changes in healthcare policies or practices;
- economic and other external factors, including effects of the COVID-19 pandemic, inflationary pressures or higher interest rates;
- reductions in purchases from our large customers;
- sales of our common stock by us, our insiders or other stockholders;
- short positions, hedging, or other transactions in our securities;
- period-to-period fluctuations in our financial results; and
- whether an active trading market in our common stock develops and is maintained.

In addition, the securities markets have from time to time experienced significant price and volume fluctuations that are unrelated to the operating performance of particular companies. These market fluctuations may also materially and adversely affect the market price of our common stock.

We have not paid cash dividends in the past and do not expect to pay cash dividends in the foreseeable future. Any return on investment may be limited to the value of our common stock.

We have never paid cash dividends on our capital stock and do not anticipate paying cash dividends on our capital stock in the foreseeable future. The payment of dividends on our capital stock will depend on our earnings, financial condition and other business and economic factors affecting us at such time as the board of directors may consider relevant. If we do not pay dividends, our common stock may be less valuable because a return on your investment will only occur if the common stock price appreciates.

We have a significant number of outstanding options and unvested restricted stock units. Future sales of these shares could adversely affect the market price of our common stock.

As of December 31, 2022, we had outstanding options for an aggregate of approximately 10.4 million shares of common stock at a weighted average exercise price of $4.21 per share and approximately 0.7 million of unvested restricted stock units. The holders may sell many of these shares in the public markets from time to time, without limitations on the timing, amount or method of sale. As and when our stock price rises, if at all, more outstanding options will be in-the-money and the holders may exercise their options and sell a large number of shares. This could cause the market price of our common stock to decline.

We have a limited operating history in China, and we face risks with respect to conducting business in connection with our joint venture in China due to certain legal, political, economic and social uncertainties relating to China.

During fiscal year 2022, we entered into an agreement to form a joint venture to expand the Company's market strategy to include opportunities in Mainland China and its territories, excluding Hong Kong, Macau and Taiwan. Operating activity under the joint venture was not material during the year ended December 31, 2022. Our participation in the joint venture in China is subject to general, as well as industry-specific, economic, political and legal developments and risks in China. Disruptions in our relationships with our collaborators could also impact the success of our joint venture, and the anticipated benefits may not materialize. The Chinese government exercises significant control over the Chinese economy, including but not limited to, controlling capital investments, allocating resources, setting monetary policy, controlling and monitoring foreign exchange rates, implementing and overseeing tax regulations, providing preferential treatment to certain industry segments or companies and issuing necessary licenses to conduct business. In addition, we could face additional risks resulting from changes in China's data privacy and cybersecurity requirements. Accordingly, any adverse change in the Chinese economy, the Chinese legal system or Chinese governmental, economic or other policies could have a material adverse effect on our joint venture in China and our prospects generally.

We face additional risks in China due to China's historically limited recognition and enforcement of contractual and intellectual property rights. We may experience difficulty enforcing our intellectual property rights in China. Unauthorized use of our technologies and intellectual property rights by partners or competitors may dilute or undermine the strength of our brands. If we cannot adequately monitor the use of our technologies and products or enforce our intellectual property rights in China or contractual restrictions relating to use of our intellectual property by Chinese companies, our revenue could be adversely affected.

Our joint venture will be subject to laws and regulations applicable to foreign investment in China. There are uncertainties regarding the interpretation and enforcement of laws, rules and policies in China. Because many laws and regulations are relatively new, the interpretations of many laws, regulations and rules are not always uniform. Moreover, the interpretation of statutes and regulations may be subject to government policies reflecting domestic political agendas. Enforcement of existing laws or contracts based on existing law may be uncertain and sporadic. As a result of the foregoing, it may be difficult for us to obtain swift or equitable enforcement of laws ostensibly designed to protect companies like ours, which could have a material adverse effect on our business and results of operations. There is no guarantee that we will be able to successfully launch our joint venture.

The COVID-19 pandemic has adversely affected, and may continue to pose risks to, our business, results of operations, financial condition and cash flows, and other epidemics or outbreaks of infectious diseases may have a similar impact.

The COVID-19 pandemic has previously adversely affected portions of our business and could have a material adverse effect on our financial condition and results of operations. Authorities in jurisdictions where we operate, or in which our suppliers, customers, or others operate, have imposed, and businesses and individuals have implemented, varied measures to try to manage or contain the virus or treat its impact, such as travel bans and restrictions, quarantines, shelter-in-place/stay-at-home and social distancing orders, shutdowns, and vaccine requirements. These measures have impacted and may further impact our workforce and operations, the operations and demands of our customers, and those of our respective suppliers and partners. Restrictions on our operations or workforce, similar limitations for our suppliers, and transportation restrictions or disruptions can limit our ability to meet customer demand and could have a material adverse effect on our financial condition and results of operations. We have experienced, and may in the future experience, delays due to global components and packaging shortages for our consumer products across our supply chain which can result in delayed, reduced, or cancelled orders and which may adversely affect our results of operations.

The pandemic caused us to modify our business practices, including with respect to flexible work and social distancing measures. These and other measures introduce additional operational risks, including cybersecurity risks, and have affected the way we conduct our day-to-day activities, which could have a material adverse effect on our operations. The pandemic has also previously resulted in substantial economic uncertainty, volatility and instability in the credit and financial markets. This economic environment may result in reduced consumer and investor confidence and reduced business and consumer spending. The result of which could adversely affect our results of operations by limiting our ability to secure future financing and reduce our sales, margins and/or net income. Further, any reduced demand for our products due to potential declines in consumer spending could lead to declines in our production volumes which may negatively impact any economies of scale we previously benefited from. The degree to which COVID-19 impacts our results will depend on future developments, and there is no certainty that measures we have taken or will take will be sufficient to mitigate the risks posed by the virus. Additional impacts and risks may arise that we or our customers, suppliers, and other partners are not aware of or able to respond to effectively, and which may adversely affect us. The impact of COVID-19 or outbreak of any other epidemic or infectious disease can also exacerbate other risks discussed in these risk factors and throughout this report.

Our ability to use our net operating loss (NOL) carryforwards and certain other tax attributes may be limited.

Our federal net operating losses (NOLs) generated in taxable years beginning on or prior to December 31, 2017 could expire unused. Under current law, federal NOLs incurred in taxable years beginning after December 31, 2017, may be carried forward indefinitely, but the deductibility of such federal NOLs in tax years beginning after December 31, 2020, is limited to 80% of taxable income. It is uncertain if and to what extent various states will conform to federal tax laws. In addition, under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, and corresponding provisions of state law, if a corporation undergoes an "ownership change," which is generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period, the corporation's ability to use its pre-change NOL carryforwards and other pre-change tax attributes (such as research tax credits) to offset its post-change income or taxes may be limited. We may experience ownership changes in the future as a result of subsequent shifts in our stock ownership, some of which may be outside of our control. As a result, if we earn net taxable income, our ability to use our pre-ownership change NOL carryforwards to offset U.S. federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to us. In addition, at the state level, there may be periods during which the use of NOLs is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed.

Our bylaws, as amended (Bylaws) provide that the Court of Chancery of the State of Delaware is the exclusive forum for certain disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our Bylaws provide that the Court of Chancery of the State of Delaware will be the sole and exclusive forum for the following types of actions or proceedings under Delaware statutory or common law: (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors or officers to our company or our stockholders, (iii) any action asserting a claim against our company arising pursuant to any provision of the Delaware General Corporation Law or our amended and restated certificate of incorporation or Bylaws, or (iv) any action asserting a claim against our company governed by the internal affairs doctrine.

This choice of forum provision may limit a stockholder's ability to bring certain claims in a judicial forum that it finds favorable for disputes with us or any of our directors, officers, other employees or stockholders, which may discourage lawsuits with respect to such claims, although our stockholders will not be deemed to have waived our compliance with federal securities laws and the rules and regulations thereunder. While the Delaware courts have determined that such choice of forum provisions are facially valid and several state trial courts have enforced such provisions, there is no guarantee that courts of appeal will affirm the enforceability of such provisions and a stockholder may nevertheless seek to bring a claim in a venue other than that designated in the exclusive forum provision. If a court were to find this choice of forum provision to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect our business and financial condition.

General Risks

We may become involved in securities class action litigation that could divert management's attention and harm our business.

The stock market in general, and the stocks of early-stage companies in particular, have experienced extreme price and volume fluctuations. These fluctuations have often been unrelated or disproportionate to the operating performance of the companies involved. If these fluctuations occur in the future, the market price of our shares could fall regardless of our operating performance. In the past, following periods of volatility in the market price of a particular company's securities, securities class action litigation has often been brought against that company. If the market price or volume of our shares suffers extreme fluctuations, then we may become involved in this type of litigation, which would be expensive and divert management's attention and resources from managing our business.

As a public company, we may also from time to time make forward-looking statements about future operating results and provide some financial guidance to the public markets. Projections may not be made in a timely manner, or we might fail to reach expected performance levels and could materially affect the price of our shares. Any failure to meet published forward-looking statements that adversely affect the stock price could result in losses to investors, stockholder lawsuits or other litigation, sanctions or restrictions issued by the Securities and Exchange Commission.

Our failure to establish and maintain effective internal control over financial reporting could result in material misstatements in our financial statements, our failure to meet our reporting obligations and cause investors to lose confidence in our reported financial information, which in turn could cause the trading price of our common stock to decline.

Maintaining effective internal control over financial reporting is necessary for us to produce reliable and timely financial statements and disclosures. If we identify material weaknesses in our internal controls and/or fail to establish and maintain effective controls and procedures and internal control over financial reporting it could result in material misstatements in our financial statements and/or a failure to meet our reporting and financial obligations, each of which could have a material adverse effect on our financial condition and the trading price of our common stock. The SEC has proposed new rules regarding climate change and cybersecurity that, if adopted, require significant new disclosure obligations of us and require us to update and develop our controls to accommodate these new obligations.

Changes in tax laws or regulations that are applied adversely to us or our customers may have a material adverse effect on our business, cash flow, financial condition or results of operations.

New income, sales, use or other tax laws, statutes, rules, regulations or ordinances could be enacted at any time, which could adversely affect our business operations and financial performance. Further, existing tax laws, statutes, rules, regulations or ordinances could be interpreted, changed, modified or applied adversely to us. For example, the Biden administration and Congress have proposed various U.S. federal tax law changes, which if enacted could have a material impact on our business, cash flows, financial condition or results of operations. In addition, it is uncertain if and to what extent various states will conform to federal tax laws. Future tax reform legislation could have a material impact on the value of our deferred tax assets, could result in significant one-time charges, and could increase our future U.S. tax expense.

Our shares of common stock may be thinly traded, so you may be unable to sell at or near ask prices or at all.

We cannot predict the extent to which an active public market for our common stock will develop or be sustained. This situation may be attributable to a number of factors, including the fact that we are a small company that is relatively unknown to stock analysts, stock brokers, institutional investors and others in the investment community who generate or influence sales volume, and that even if we came to the attention of such persons, they tend to be risk averse and would be reluctant to follow an unproven company such as ours or purchase or recommend the purchase of our shares until such time as we have become more seasoned and viable. As a consequence, there may be periods of several days or weeks when trading activity in our shares is minimal or non-existent, as compared to a seasoned issuer which has a large and steady volume of trading activity that will generally support continuous sales without an adverse effect on share price. We cannot assure you that a broader or more active public trading market for our common stock will develop or be sustained, or that current trading levels will be sustained or not diminish.

Stockholders may experience significant dilution if future equity offerings are used to fund operations or acquire complementary businesses.

If future operations or acquisitions are financed through the issuance of additional equity securities, stockholders could experience significant dilution. Securities issued in connection with future financing activities or potential acquisitions may have rights and preferences senior to the rights and preferences of our common stock. In addition, the issuance of shares of our common stock upon the exercise of outstanding options or warrants may result in dilution to our stockholders.

Environmental, social and governance matters may impact our business and reputation.

Companies across many industries are facing increased scrutiny, including by consumers, investors, employees and other stakeholders, as well as by governmental and non-governmental organizations surrounding environmental, social and governance (ESG) practices. This increased scrutiny and changing expectations with respect to the Company's ESG practices as well as new rules and regulations may result in additional costs or risks. The SEC has proposed new rules regarding climate change that, if adopted, require significant new disclosure obligations of us and require us to update and develop our controls to accommodate these new obligations. Standards and research regarding ESG practices could change as a result of these rules. If we are unable to satisfy such new criteria, investors may conclude that our policies with respect to corporate responsibility are inadequate. We risk damage to our brand and reputation in the event that our corporate responsibility procedures or standards do not meet the standards set by various constituencies, which could lead to the loss of existing or potential customers and reduced sales. There can be no assurance that investors or other constituents will not publicly advocate for us to not make corporate governance changes or engage in corporate actions and responding to challenges could be costly and time consuming.

Developing and achieving ESG initiatives may result in increased costs in our supply chain, fulfillment, and/or corporate business operations, and could deviate from our initial estimates and have a material adverse effect on our business and financial condition. Furthermore, if our competitors' corporate responsibility performance is perceived to be greater than ours, potential or current investors may elect to invest with our competitors instead. Investor advocacy groups, certain institutional investors, investment funds and other influential investors are increasingly focused on ESG practices and in recent years have placed increasing importance on the non-financial impacts of their investments. Topics taken into account in such assessments include, among others, the company's efforts and impacts on climate change and human rights, ethics and compliance with law and the role of the Company's board of directors in supervising various sustainability issues. In light of investors' and other stakeholders' increased focus on ESG matters, there can be no certainty that we will manage such issues successfully, or that we will successfully meet our investors' or society's ESG expectations. While our mission is to promote healthy aging, if our ESG practices do not meet investor or other industry stakeholder expectations, which continue to evolve, we may incur additional costs and our brand's ability to attract and retain qualified employees and business may be harmed.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

As of December 31, 2022, we lease (i) approximately 10,000 square feet of office space in Los Angeles, California with four years remaining on the lease, (ii) approximately 20,000 square feet of space for a research and development laboratory in Longmont, Colorado with three years remaining on the lease, and (iii) approximately 8,000 square feet of office space in Tustin, California with six years remaining on the lease. We do not own any real estate. The below table illustrates the use of each property by our business segments.

Business Segment	Property Used
Consumer Products	All properties
Ingredients	All properties
Analytical Reference Standards and Services	Longmont, CO

For the year ended December 31, 2022, our total annual rent expense was approximately $1,281,000.

Item 3. Legal Proceedings

The information set forth under the heading "Legal Proceedings" in Note 17, Commitments and Contingencies, in Notes to the Consolidated Financial Statements in Item 8 of Part II of this Form 10-K, is incorporated herein by reference. For additional discussion of certain risks associated with legal proceedings, see Item 1A, Risk Factors.

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

Since April 25, 2016, our common stock has been traded on The Nasdaq Capital Market (NASDAQ) under the symbol "CDXC." On March 6, 2023, the closing sale price was $1.62.

Holders of Our Common Stock

As of March 6, 2023, we had approximately 40 registered holders of record of our common stock, which does not include stockholders who hold shares in street name or stockholders whose shares may be held in trust by other entities.

Dividend Policy

We have not declared or paid any cash dividends on our common stock during either of the two most recent fiscal years and have no current intention to pay any cash dividends. Our ability to pay cash dividends is governed by applicable provisions of Delaware law and is subject to the discretion of our Board of Directors.

Recent Sales of Unregistered Securities

On September 30, 2022, we entered into a Securities Purchase Agreement with Pioneer Step Holdings Limited (Pioneer Step), Champion River Ventures Limited (Champion) and Robert Fried (collectively, the "Purchasers") pursuant to which we agreed to sell and issue approximately 2.5 million shares of common stock at a price of $1.25 per share (the "Financing"). Champion is indirectly owned by Li Ka-Shing and Pioneer Step is indirectly owned by Solina Chau, and each of Mr. Ka-Shing and Ms. Chau own through affiliated entities more than 5% of the Company's common stock. Pursuant to previous agreements, each of Pioneer Step and Champion have appointed a member of our Board. Mr. Fried is our Chief Executive Officer. The transaction and related agreements were approved by the Audit Committee of the Board in accordance with our Related-Persons Transaction Policy. On October 7, 2022, we closed the Financing and received proceeds of approximately $2.9 million, net of offering costs of $0.2 million.

On October 10, 2022, we entered into a Securities Purchase Agreement with Société des Produits Nestlé SA, a société anonyme organized under the laws of Switzerland (NHSc), as successor-in-interest to NESTEC Ltd., pursuant to which NHSc agreed to purchase 3.8 million shares of common stock at a price of $1.31 which is equal to the volume weighted average price of the Company's common stock for the ten trading days preceding October 10, 2022 (the "Securities Purchase Agreement"). On October 17, 2022, we closed the Securities Purchase Agreement and received proceeds of approximately $4.8 million, net of offering costs of $0.2 million.

Item 6. Reserved

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion and analysis of financial condition and results of operations should be read in conjunction with the consolidated financial statements and accompanying notes included elsewhere this Form 10-K. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of various factors, including those discussed below and elsewhere in this Annual Report on Form 10-K. We encourage you to review the risks and uncertainties described in Part I. Item 1A. Risk Factors and Cautionary Notice Regarding Forward-Looking Statements.

Overview

ChromaDex Corporation and its wholly owned subsidiaries, ChromaDex, Inc., ChromaDex International, Inc., ChromaDex Analytics, Inc., ChromaDex Asia Limited, Asia Pacific Scientific, Inc., ChromaDex Europa B.V. and ChromaDex Sağlik Ürünleri Anonim Şirketi (collectively, "ChromaDex", the "Company" or, in the first person as "we" "us" and "our") are a global bioscience company dedicated to healthy aging. The ChromaDex team, which includes world-renowned scientists, is pioneering research on nicotinamide adenine dinucleotide (NAD+), an essential coenzyme that is a key regulator of cellular metabolism and is found in every cell of the human body. NAD+ levels in humans have been shown to decline with age, among other factors, and may be increased through supplementation with NAD+ precursors.

ChromaDex is the innovator behind the NAD+ precursor nicotinamide riboside (NR), commercialized as the flagship ingredient Niagen®. Nicotinamide riboside and other NAD+ precursors are protected by ChromaDex's patent and/or licensed rights portfolio. The Company delivers Niagen® as the sole active ingredient in its consumer product Tru Niagen®. The Company further develops and commercializes proprietary-based ingredient technologies and supplies these ingredients as raw materials to the manufacturers of consumer products. Additionally, the Company offers natural product fine chemicals, known as phytochemicals, and related research and development services.

Our operations are subject to regulation by various state and federal agencies. Dietary supplements are subject to FDA, FTC and U.S. Department of Agriculture regulations relating to composition, labeling and advertising claims. These regulations may in some cases, particularly with respect to those applicable to new ingredients, require a notification that must be submitted to the FDA along with evidence of safety and similar regulations exist related to food additives.

The discussion and analysis of our financial condition and results of operations are based on the ChromaDex financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles (GAAP). The preparation of these financial statements requires making estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenues, if any, and expenses during the reporting periods. On an ongoing basis, we evaluate such estimates and judgments, including those described in greater detail below. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Recent Activities

Securities Purchase Agreement and Registration Rights Agreement - Related Parties

On September 30, 2022, we entered into a Securities Purchase Agreement with Pioneer Step Holdings Limited (Pioneer Step), Champion River Ventures Limited (Champion) and Robert Fried (collectively, the "Purchasers") pursuant to which we agreed to sell and issue approximately 2.5 million shares of common stock at a price of $1.25 per share (the "Financing"). Champion is indirectly owned by Li Ka-Shing and Pioneer Step is indirectly owned by Solina Chau, and each of Mr. Ka-Shing and Ms. Chau own through affiliated entities more than 5% of the Company's common stock. Pursuant to previous agreements, each of Pioneer Step and Champion have appointed a member of our Board. Mr. Fried is our Chief Executive Officer. The transaction and related agreements were approved by the Audit Committee of the Board in accordance with our Related-Persons Transaction Policy. On October 7, 2022, we closed the Financing and received proceeds of approximately $2.9 million, net of offering costs of $0.2 million.

In connection with the Financing, on September 30, 2022, we also entered into a Registration Rights Agreement with the Purchasers (the "Registration Rights Agreement"), pursuant to which we agreed to (i) file one or more registration statements with the SEC to cover the resale of the shares of Common Stock issued to the Purchasers, (ii) use reasonable best efforts to have all such registration statements declared effective within the timeframes set forth in the Registration Rights Agreement, and (iii) use commercially reasonable efforts to keep such registration statements effective during the timeframes set forth in the Registration Rights Agreement. We filed a Registration Statement registering the resale of the shares of Common Stock in November 2022. In the event that such registration statement subsequently becomes unavailable, or the Purchasers are unable to sell the shares of Common Stock issued pursuant to the Financing due to failure by us to satisfy the current public information requirement of Rule 144 under the Securities Act, we would be required to pay liquidated damages to the Purchasers equal to 1.0% of the aggregate purchase price per month for each default (up to a maximum of 5.0% of such aggregate purchase price)

Joint Venture

On September 30, 2022, Asia Pacific Scientific, Inc., an indirect wholly owned subsidiary of the Company, and Hong Kong (China) Taikuk Group Ltd (Taikuk) entered into a shareholders agreement pursuant to which, among other details, Taikuk will receive an 11% non-voting equity interest in ChromaDex Asia Pacific Ventures Limited, a subsidiary of Asia Pacific Scientific, Inc. (the "Joint Venture" or "JV"). We indirectly own an 89% equity interest (and all of the voting interests) in the JV and have the right to elect all three directors of the JV. The purpose of the JV is to commercialize Tru Niagen® and other products containing nicotinamide riboside to be developed by us (the "Products") in Mainland China and its territories, excluding Hong Kong, Macau and Taiwan (the "Territory").

Prior to being able to commercialize the Products in the Territory, the JV will have to obtain all applicable regulatory approvals, including "Blue Hat" or health food registration with the Peoples Republic of China State Administration for Market Regulation for Products in our name or our designee (collectively, the "Blue Hat Registration"). For further discussion, see Note 12, *Joint Venture*.

Supply Agreement and Securities Purchase Agreement - NHSc

On October 10, 2022, we along with Société des Produits Nestlé SA, a société anonyme organized under the laws of Switzerland (NHSc), as successor-in-interest to NESTEC Ltd., entered into an amended and restated supply agreement (the "Supply Agreement"), which amends and restates the supply agreement, dated December 19, 2018, entered into by the Company and NESTEC Ltd. Pursuant to the Supply Agreement, NHSc and its affiliates will exclusively purchase nicotinamide riboside chloride (NRCL) from us and NHSc and its affiliates will have the non-exclusive right to manufacture, market, distribute, and sell products using NRCL for human use in the (i) medical nutritional, (ii) functional food and beverage and (iii) multi-ingredient dietary supplements categories sold under one of the NHSc brands (the "Approved Products") world-wide, but excluding certain countries and ingredient combinations. For further discussion, see Note 14, *NHSc Revenue*.

In connection with the entry into the Supply Agreement, we entered into a Securities Purchase Agreement with NHSc, pursuant to which NHSc agreed to purchase 3.8 million shares of common stock at a price of $1.31 which is equal to the volume weighted average price of our common stock for the ten trading days preceding October 10, 2022 (the "Securities Purchase Agreement"). On October 17, 2022, we closed the Securities Purchase Agreement and received proceeds of approximately $4.8 million, net of offering costs of $0.2 million.

Purchase Commitment

Effective as of December 14, 2022, we entered into an Eighth Amendment (Eighth Amendment) to the Manufacturing and Supply Agreement (such agreement as amended, the "Grace Manufacturing Agreement"), originally effective in January 2016 with W.R. Grace & Co. –Conn. (Grace). Beginning in January 2019, Grace was issued patents related to the manufacturing of the crystalline form of NR (Grace Patents). Pursuant to the Eighth Amendment, we are committed to purchase approximately $18.0 million of total inventory during fiscal year 2023, which is our only future purchase commitment with Grace. The Grace Manufacturing Agreement will expire on December 31, 2023, subject to further renewal of the agreement to be negotiated by the parties.

Impact of COVID-19

The worldwide outbreak of COVID-19 continues to drive global uncertainty and disruption, which has created headwinds for our business. Authorities have imposed, and businesses and individuals have implemented, numerous measures to try to contain the virus or treat its impact, such as travel bans and restrictions, remote working policies, quarantines, and store closures and reduced operating hours, among other measures. These measures have impacted and may further impact our workforce and operations and those of our respective suppliers and partners.

Our primary focus throughout the COVID-19 pandemic has remained ensuring the health and safety of our employees through office closures or implementing enhanced safety protocols to ensure the well-being of our employees. We have successfully adapted and have been able to conduct business virtually. Today, many of our employees continue to work remotely efficiently and we plan to continue to offer this flexible work environment.

Under the Coronavirus Aid, Relief, and Economic Security Act the employee retention tax credit (ERTC) was established and subsequently amended by other Acts. During the third quarter of 2022, we evaluated our eligibility for the ERTC and determined that we qualified in all three quarters of 2020 and the first three quarters in 2021. As a result, during August 2022, we filed a claim for the ERTC. During 2022, we recognized approximately $2.1 million in Other income - Employee Retention Tax Credit in our Consolidated Statements of Operations to reflect the ERTC. As of December 31, 2022, we have received $0.6 million of the ERTC claimed. Subsequent to December 31, 2022, the Company received an additional $0.8 million related to the ERTC. For further discussion, see Note 18, *Employee Retention Tax Credit*.

The degree to which COVID-19 impacts our results will depend on future developments, which are uncertain and cannot be predicted, including the duration and severity of the pandemic; surges related to new variants; the actions taken to contain the virus or treat its impact; other actions taken by governments, businesses, and individuals in response to the virus and resulting economic disruption; and how quickly and to what extent normal economic and operating conditions can resume. Additional impacts and risks may arise that we are not aware of or able to respond to effectively. We are similarly unable to predict the extent of the impact of the pandemic on our customers, suppliers, and other partners, but a material effect on these parties could also materially adversely affect us. The impact of COVID-19 can also exacerbate other risks discussed in Part II, Item 1A Risk Factors and throughout this report.

Supply chain disruptions, inflation and changing prices

We have in the past experienced, and could in the future experience, global supply chain delays including challenges with transportation, logistics and production lead-times, as well as labor shortages and cost inflation. Supply chain delays, among other factors such as store closures, impacted sales to our partners in international markets during the year ended December 31, 2022. While these headwinds appear to have mostly subsided for our partners, they could still affect future sales. We continue to collaborate with these partners and strive to maintain adequate safety stocks to sustain growth and prevent disruptions caused by supply chain delays. We believe we have adequate inventory on hand to fulfill current demands.

We have also experienced inflation in labor, raw materials, transportation and other costs. Inflation can have a long-term impact as increasing costs may affect our ability to maintain satisfactory margins. We may be unsuccessful in passing these increases on to our customers or finding other mitigating solutions. Furthermore, increases in inflation may not be matched by growth in consumer income, which could have a negative impact on customer spending. If customer sales diminish, we may be required to scale back production volumes which could negatively impact any economies of scale we have previously benefited from. We have also seen changing prices due to other macroeconomic factors including rising interest rates, fluctuations in currency exchange rates and geopolitical uncertainties such as those surrounding Russia's invasion of Ukraine. We will continue to monitor changing prices and inflationary pressures closely as conditions may become more challenging due to ongoing and uncertain economic factors.

Results of Operations

Our results of operations for the years ended December 31, 2022 and 2021 are as follows:

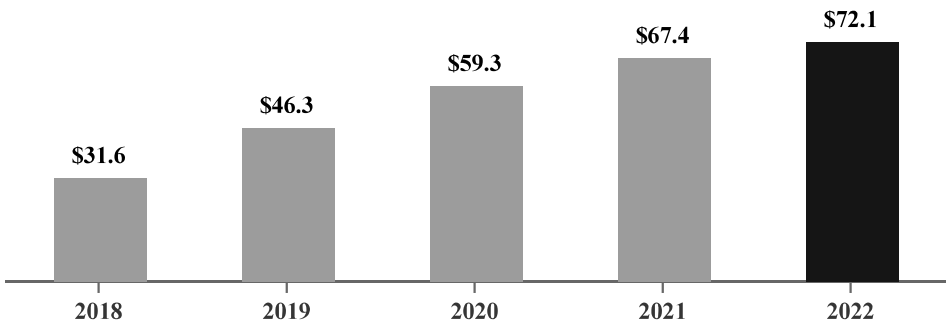
	Year Ended December 31,	
(In thousands)	**2022**	**2021**
Sales	**$ 72,050**	$ 67,449
Cost of sales	**29,253**	25,959
Gross profit	**42,797**	41,490
Operating expenses		
Sales and marketing	**28,313**	28,352
Research and development	**4,826**	3,832
General and administrative	**28,286**	36,379
Nonoperating expenses:		
Other income, net - Employee Retention Tax Credit	**2,085**	—
Interest income (expense), net	**3**	(55)
Net loss	**$ (16,540)**	$ (27,128)

Our loss per share applicable to common stockholders for the years indicated is calculated as follows:

	Year Ended December 31,	
(In thousands, except per share data)	**2022**	**2021**
Net loss	**$ (16,540)**	$ (27,128)
Basic and diluted loss per common share	**$ (0.24)**	$ (0.40)
Basic and diluted weighted average common shares outstanding (1):	**69,729**	67,185
Potentially dilutive securities (2):		
Stock options	**10,438**	10,536
Restricted stock units	**650**	115

(1) Includes approximately 0.2 million nonvested shares of restricted stock for the year ended December 31, 2022 and December 31, 2021 which are participating securities that feature voting and dividend rights.
(2) Excluded from the computation of loss per share as their impact is antidilutive.

Net Sales. Net sales consist of gross sales less discounts and returns. Our total net sales grew from $31.6 million in 2018 to $72.1 million in 2022, representing a 18% compound annual growth rate.



Total net sales by reportable segment for the years ended December 31, 2022 and 2021 are as follows:

	Year Ended December 31,		
(In thousands)	**2022**	**2021**	**Change**
Net sales:			
Consumer Products	**$ 60,110**	$ 56,705	6 %
Ingredients	**8,736**	7,407	18
Analytical reference standards and services	**3,204**	3,337	(4)
Total net sales	**$ 72,050**	$ 67,449	7 %

In 2022, our total net sales increased by 7%, up $4.6 million, from 2021.

- In 2022, Tru Niagen® sales continued to see steady e-commerce growth with $3.4 million, or 8%, higher sales compared to 2021 paired with $0.7 million in increased sales to A.S. Watson's. This growth was partially offset by declines of $0.7 million in business-to-business sales to our distributor partners. Our distributor partners have experienced lower growth during fiscal year 2022 due to COVID-19 headwinds and other macroeconomic factors. We remain committed to working with these partners to collectively maximize sales while simultaneously continuing to grow our e-commerce channels.
- In 2022, our ingredients segment experienced a $1.3 million, or 18%, increase in overall net sales compared to 2021. The increase in sales during 2022 was largely driven by the amended and restated supply agreement with Nestlé (NHSc) including a $2.0 million upfront minimum purchase in the fourth quarter of 2022. In the future, we anticipate NHSc may purchase Niagen® in smaller batch quantities. The NHSc purchase was partially offset by a decline in sales of other, non-Niagen®, ingredients.
- Net sales for our analytical reference standards and services segment moderately decreased during 2022 compared to 2021 primarily due to a decline in demand for research and development services in 2022.

Cost of Sales. Costs of sales include raw materials, labor, overhead and delivery costs. The following table sets forth our total cost of sales by reportable segment:

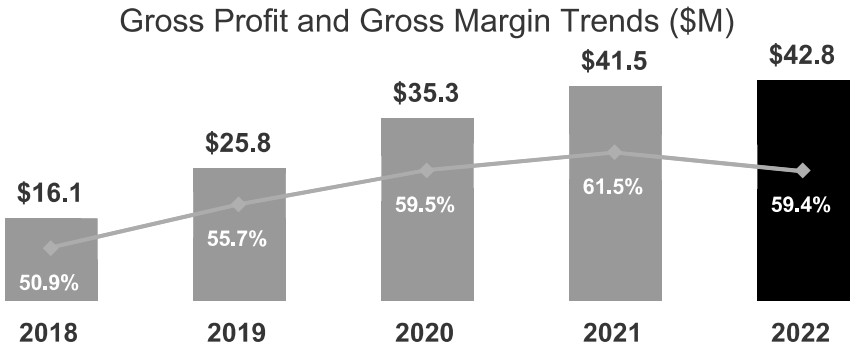
	Year Ended December 31,				
	2022		2021		Change
(In thousands)	Amount	% of net sales	Amount	% of net sales	% of net sales
Cost of sales:					
Consumer Products	**$ 21,726**	**36 %**	$ 19,864	35 %	1 %
Ingredients	**4,465**	**51**	3,233	44	7
Analytical reference standards and services	**3,062**	**96**	2,862	86	10
Total cost of sales	**$ 29,253**	**41 %**	$ 25,959	38 %	3 %

Total cost of sales, as a percentage of net sales, increased 3% in 2022 compared to 2021. Changes in cost of sales, as a percentage of net sales, were primarily driven by the following:

During 2022, we continued to explore cost saving processes and opportunities and benefit from favorable product mix.

- Cost of sales, as a percentage of net sales, for the consumer products segment remained substantially similar with only a 1% increase in 2022 compared to 2021. The minor increase is attributable to increases in our supply chain headcount, including overall wage inflation, and other inflationary pressures, partially offset by a shift in our business mix as we experienced elevated e-commerce sales which provide higher gross margins during the year ended December 31, 2022 compared to the same period in 2021.
- Cost of sales, as a percentage of net sales, for the ingredients segment increased by 7% in 2022 compared to 2021. The increase is primarily a result of increases in supply chain headcount, including overall wage inflation, paired with higher costs of raw materials and customer mix.
- Cost of sales, as a percentage of net sales, for the analytical reference standards and services segment increased 10% in 2022 compared to the same period in 2021. Cost of sales for our analytical reference standards and services segment are largely driven by fixed supply chain overhead costs which do not increase in proportion to sales. Additionally, during fiscal year 2022, we increased our supply chain headcount to scale the business based on strong growth in 2021 and were impacted by overall wage inflation, increasing these overheads costs. Accordingly, due to the increased head count for supply chain labor paired with a decrease in sales during 2022, we experienced lower labor and overhead utilization rates resulting in higher cost of sales, as a percentage of net sales, compared to 2021.

Gross Profit. Gross profit is net sales less the cost of sales and is affected by a number of factors including business and product mix, competitive pricing and costs of products, labor, overhead, services and delivery. Since 2018, total gross profit grew from $16.1 million to $42.8 million in 2022, representing a 22% compound annual growth rate. For fiscal year 2022 gross profit increased $1.3 million, or 3%, compared to 2021. Our overall gross margin percentage remained strong at 59.4% for fiscal year 2022, however it declined 210 basis points compared to 2021 largely due to increases in supply chain headcount to scale the business, including higher wages, and other inflationary pressures.



The following table sets forth our total gross profit by reportable segment:

	Year Ended December 31,		
(In thousands)	**2022**	**2021**	**Change**
Gross profit:			
Consumer Products	**$ 38,384**	$ 36,841	4 %
Ingredients	**4,271**	4,174	2
Analytical reference standards and services	**142**	475	(70)
Total gross profit	**$ 42,797**	$ 41,490	3 %

For details supporting year-over-year changes in gross profit refer to the discussions above surrounding changes in our net sales and cost of sales for each segment.

Operating Expenses - Sales and Marketing. Sales and marketing expense consists of salaries, advertising, public relations and marketing expenses. Sales and marketing expense by reportable segment is as follows:

	Year Ended December 31,				
	2022		**2021**		**Change**
(In thousands)	**Amount**	**% of net sales**	**Amount**	**% of net sales**	**% of net sales**
Sales and marketing expenses:					
Consumer Products	**$ 27,661**	**46 %**	$ 27,821	49 %	(3)%
Ingredients	**51**	**1**	46	1	—
Analytical reference standards and services	**601**	**19**	485	15	4
Total sales and marketing expenses	**$ 28,313**	**39 %**	$ 28,352	42 %	(3)%

- We continue to focus our primary marketing efforts on our consumer products segment to increase consumer awareness of Tru Niagen®. In 2022, we pivoted our marketing efforts to focus on the most efficient distribution channels and marketing campaigns which resulted in lower selling and marketing expenses as a percentage of net sales by 3%.
- For the ingredients segment, sales and marketing expenses were substantially similar totaling $51,000 in 2022 and $46,000 in 2021 with approximately no change when compared as a percentage of net sales.
- For the analytical reference standards and services segment, sales and marketing expenses increased by approximately $0.1 million in 2022 compared to 2021 as costs were impacted by overall wage inflation.

Operating Expenses - Research and Development. Research and development (R&D) expense consists primarily of clinical trials, product development and process development expenses. Research and development expenses by reportable segment are as follows:

	Year Ended December 31,		
(In thousands)	**2022**	**2021**	**Change**
R&D expenses:			
Consumer Products	**$ 4,214**	$ 3,427	23 %
Ingredients	**612**	405	51
Total R&D expenses	**$ 4,826**	$ 3,832	26 %

- We allocate R&D expenses related to our Niagen® branded ingredient to the consumer products and ingredients segment, based on revenues recorded. Overall, R&D expenses increased approximately $1.0 million in 2022 compared to 2021 largely due to increased headcount, share-based compensation and timing of projects.

Operating Expenses - General and Administrative. General and administrative expense consists of general company administration, legal, royalties, information technology, accounting and executive management expenses. General and administrative expense is not allocated by segment and is instead classified under our Corporate and Other category. General and administrative expense for the periods indicated is as follows:

	Year Ended December 31,		
(In thousands)	**2022**	**2021**	**Change**
General and administrative	**$ 28,286**	$ 36,379	(22)%

The decline in general and administrative expense for 2022, compared to 2021, of $8.1 million was driven by lower legal expense of $9.9 million which was partially offset by higher severance and restructuring expense of $0.7 million paired with investments in technology, overall wage inflation and higher royalties expense. For additional details regarding our litigation see Note 17, *Commitments and Contingencies, Legal Proceedings* in the Notes to the Consolidated Financial Statements, included in Part II, Item 8 of this Form 10-K.

Nonoperating - Interest Expense, net. Interest expense, net consists of interest earned from bank deposit accounts less interest expenses from the line of credit arrangement and finance leases. Interest expense, net totaled approximately $3,000 and $55,000 for the years ended December 31, 2022 and 2021, respectively.

Depreciation and Amortization. Depreciation expense was approximately $0.9 million for both of the years ended December 31, 2022 and 2021. We depreciate our assets on a straight-line basis, based on the estimated useful lives of the respective assets.

Amortization expense of intangible assets was approximately $0.2 million for each of the years ended December 31, 2022 and 2021. We amortize intangible assets using a straight-line method, generally over 10 years. For licensed patent rights, the useful lives are 10 years or the remaining term of the patents underlying licensing rights, whichever is shorter. The useful life of subsequent milestone payments that are capitalized match the remaining useful life of the initial licensing payment that was originally capitalized. Amortization expense of right-of-use assets for the year ended December 31, 2022 was approximately $0.8 million as compared to $0.5 million for the year ended December 31, 2021.

Income Taxes. Deferred tax assets are reduced by a valuation allowance when, in the opinion of management, it is more likely than not that some portion or all of the deferred tax assets will not be realized. At December 31, 2022 and 2021, we maintained a full valuation allowance against the entire deferred income tax balance which resulted in an effective tax rate of approximately 0% for both of the years ended December 31, 2022 and 2021. As defined in ASC 740, Income Taxes, future realization of the tax benefit will depend on the existence of sufficient taxable income, including the expectation of continued future taxable income.

Net cash used in operating activities. Cash used in operating activities is net loss adjusted for certain non-cash items and changes in operating assets and liabilities. Net cash used in operating activities was approximately $15.1 million and $24.2 million in 2022 and 2021, respectively. The decrease in cash used during the year ended December 31, 2022 compared to 2021 was primarily driven by improvements in our net loss of $8.5 million excluding Other income from the Employee Retention Tax Credit of $2.1 million.

We expect our operating cash flows to fluctuate significantly in future periods as a result of fluctuations in our operating results, shipment timetables, trade receivable collections, inventory management, and the timing of our payments, among other factors.

Net cash used in investing activities. Investing cash flows consist primarily of capital expenditures and investment activities. Net cash used in investing activities was approximately $0.3 million and $0.4 million in 2022 and 2021, respectively. The slight decrease in cash used during the year ended December 31, 2022 compared to 2021 was primarily due to fewer purchases of leasehold improvements and equipment in 2022.

Net cash provided by financing activities. Financing cash flows consist primarily of proceeds from issuance of our common stock, exercise of stock options through employee equity incentive plans and repayment of short-term and long-term debt. Net cash provided by financing activities was approximately $7.7 million and $36.1 million in 2022 and 2021, respectively. The decrease in cash provided during the year ended December 31, 2022 compared to 2021 was primarily due to decreased proceeds from issuance of our common stock of $19.0 million and no proceeds related to the exercise of employee stock options resulting in a decrease of $9.5 million.

Trade Receivables. As of December 31, 2022, we had approximately $8.5 million in trade receivables as compared to approximately $5.2 million as of December 31, 2021. The increase in 2022 is driven by the timing of customer orders and collections, including the upfront minimum purchase by NHSc during the fourth quarter of 2022.

Inventories. As of December 31, 2022, we had approximately $14.7 million in inventory, compared to approximately $13.6 million as of December 31, 2021. As of December 31, 2022, our inventory consisted of approximately $10.9 million of consumer products, $3.3 million of bulk ingredients and $0.5 million of reference standards. Consumer products inventory consists of Tru Niagen® branded finished bottles of dietary supplement products and related work-in-process inventory. Bulk ingredients are proprietary compounds sold to customers in larger quantities, typically in kilograms. These ingredients are used by our customers in the dietary supplement, food and beverage industries to manufacture their final products. Reference standards are small quantities of plant-based compounds typically used to research an array of potential attributes or for quality control purposes. The Company currently lists over 1,750 phytochemicals and 400 botanical reference materials in our catalog and holds a lot of these as inventory in small quantities, mostly in grams and milligrams.

The Company regularly reviews inventories on hand and reduces the carrying value for slow-moving and obsolete inventory, inventory not meeting quality standards and inventory subject to expiration. The reduction of the carrying value for slow-moving and obsolete inventory is based on current estimates of future product demand, market conditions and related management judgment. Any significant unanticipated changes in future product demand or market conditions that vary from current expectations could have an impact on the value of inventories.

We strive to optimize our supply chain as we constantly search for better and more reliable sources and suppliers. By doing so, we believe we can lower the costs of our inventory and yield higher gross profit. In addition, we are working with our suppliers and partners to develop more efficient manufacturing methods in an effort to lower the costs of our inventory.

Accounts Payable. As of December 31, 2022, we had $9.7 million in accounts payable compared to approximately $10.4 million as of December 31, 2021 driven by the timing of purchases and payments to our vendors.

Liquidity and Capital Resources

For the year ended December 31, 2022, we incurred losses from operations of approximately $16.5 million. Net cash used in operating activities for the year ended December 31, 2022 was approximately $15.1 million. The losses and the uses of cash are primarily attributable to expenses associated with the development and expansion of our operations, as well as legal expenditures. These operations have been financed through capital contributions, primarily through the issuance of common stock in private placements, and cash generated from net sales.

As of December 31, 2022, we had purchase obligations of approximately $18.0 million related to inventory purchase commitments and approximately $4.9 million related to future minimum lease obligations to be paid over one year and six years, respectively. As of December 31, 2022 and 2021, we had no material off-balance sheet arrangements. We have an available line of credit with Western Alliance Bank for up to $10.0 million, subject to certain terms and conditions which as of December 31, 2022 allows for $6.1 million of borrowing. As of December 31, 2022, unrestricted cash and cash equivalents totaled approximately $20.3 million and we had no borrowings outstanding under our line of credit. We anticipate that our current unrestricted cash and cash equivalents and cash to be generated from net sales will be sufficient to meet our projected operating plans through at least the next twelve months from the issuance date of these financial statements. We may, however, seek additional capital within the next twelve months, both to meet our projected operating plans after the next twelve months and/or to fund our longer term strategic objectives.

In June 2020, we filed a $125 million registration statement on Form S-3 with the Commission, utilizing a “shelf” registration process. Under this shelf registration process, we may sell securities from time to time, including up to $50 million pursuant to the At Market Issuance Sales Agreement, dated as of June 12, 2020, with B. Riley FBR, Inc. and Raymond James & Associates, Inc. (ATM Facility). As of December 31, 2022, approximately $47.8 million remains available under the ATM Facility. Our potential use of the ATM facility is subject to the satisfaction of various conditions in the ATM Facility agreement as well as market conditions. As a result, our ability to rely on the ATM Facility to raise liquidity is limited to a material extent.

Our Board of Directors periodically reviews our material cash requirements in light of our proposed business plan. Our future capital requirements will remain dependent upon a variety of factors, including cash flow from operations, the ability to increase sales, increasing our gross profits from current levels, reducing sales and administrative expenses as a percentage of net sales, continued development of customer relationships, and our ability to market our new products successfully. However, based on our results from operations, we may determine that we need additional financing to implement our business plan. Additional capital may come from other public and/or private stock or debt offerings, borrowings under lines of credit or other sources. These additional funds may not be available on favorable terms, or at all. Further, if we issue equity or debt securities to raise additional funds, our existing stockholders may experience dilution and the new equity or debt securities we issue may have rights, preferences and privileges senior to those of our existing stockholders. In addition, if we raise additional funds through collaboration, licensing or other similar arrangements, it may be necessary to relinquish valuable rights to our products or proprietary technologies, or to grant licenses on terms that are not favorable to us. If we cannot raise funds on acceptable terms, we may not be able to develop or enhance our products, obtain required regulatory clearances or approvals, achieve long term strategic objectives, capitalize on future opportunities, or respond to competitive pressures or unanticipated customer requirements. Any of these events could adversely affect our ability to achieve our development and commercialization goals, which could have a material and adverse effect on our business, results of operations and financial condition. Further, the global credit and financial markets have experienced extreme volatility, including diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability. There can be no assurance that further deterioration in credit and financial markets and confidence in economic conditions will not occur. If equity and credit markets deteriorate, it may make any necessary debt or equity financing more difficult to obtain, more costly and/or more dilutive.

Dividend Policy

We have not declared or paid any cash dividends on our common stock. We presently intend to retain earnings for use in our operations and to finance our business. Any change in our dividend policy is within the discretion of our board of directors and will depend, among other things, on our earnings, debt service and capital requirements, restrictions in financing agreements, if any, business conditions, legal restrictions and other factors that our board of directors deems relevant.

Critical Accounting Estimates

The discussion and analysis of our financial condition and results of operations are based on our financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosures. On an ongoing basis, we evaluate these estimates, including those related to the valuation of share-based payments and deferred revenue recognition. We base our estimates on historical experience and other various assumptions that are believed 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. For a summary of our significant accounting policies, including the accounting policy discussed below, see Note 2 of the Financial Statements, set forth in Item 8 of this Form 10-K.

***Revenue recognition*:** Beginning in fiscal year 2018, we adopted Financial Accounting Standards Board (FASB) Topic 606 - Revenue for Contracts from Customers which amended revenue recognition principles and provides a single, comprehensive set of criteria for revenue recognition within and across all industries.

The revenue standard provides a five-step framework for recognizing revenue as control of promised goods or services is transferred to a customer at an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. To determine revenue recognition for arrangements that are within the scope of the revenue standard, we perform the following five step analyses: (i) identify the contract; (ii) identify the performance obligations; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) we satisfy a performance obligation. We recognize sales and the related cost of sales when the performance obligations are satisfied. The performance obligations are typically satisfied upon shipment of physical goods or as the services are performed over time. Discounts, returns and allowances related to sales, including an estimated reserve for the returns and allowances, are recorded as reduction of revenue.

Whenever we determine that goods or services promised in a contract should be accounted for as a combined performance obligation over time, we determine the period over which the performance obligations will be performed and revenue will be recognized. If we determine that the performance obligation is satisfied over time, any upfront payment received is initially recorded as deferred revenue on our consolidated balance sheets.

Revenue is then recognized utilizing the output method based on an estimated rate to allocate the transaction price for this performance obligation as products or services are supplied over the duration of the contract. We believe this most appropriately depicts our performance towards complete satisfaction of the performance obligation to our customer. Certain judgments affect the application of our revenue recognition policy. For example, when utilizing the output method, we estimate total delivery volume based on our current operating plan, forecast inputs received from the customer for expected purchases, minimum purchase commitments by the customer and historical experience with similar customer contracts. Accordingly, we may recognize a different amount of deferred revenue over the next 12-month period if our plan changes in the future or if our customer informs us of changes to their expected purchases. As of December 31, 2022 and 2021, we held deferred revenue balances of $4.0 million and $4.3 million, respectively.

We may periodically enter into bill-and-hold arrangements upon request by certain customers according to the terms in the contract. Under the terms, the customer makes a fixed commitment to purchase our goods, however the customer delays the physical transfer of the goods until a later date. In such instances, revenue is recognized when a customer obtains control of the promised goods and we have satisfied all of our performance obligations. We consider indicators of the transfer of control, which include, but are not limited to, the following: (i) we have a present right to payment for the asset, (ii) the customer has legal title to the asset, (iii) we have transferred physical possession of the asset, (iv) the customer has the significant risks and rewards of ownership of the asset and (v) the customer has accepted the asset.

In addition, all of the following criteria in a bill-and-hold arrangement must be met to further indicate a customer has obtained control of the goods: (i) the reason for the bill-and-hold arrangement must be substantive, (ii) the requested goods must be identified separately as belonging to the customer, (iii) the requested goods must be ready for physical transfer to the customer, and (iv) we cannot have the ability to use the goods or direct the goods to another customer. Revenue under bill-and-hold arrangements was $1.7 million for the year ended December 31, 2022. There was no revenue under bill-and-hold arrangements for the year ended December 31, 2021.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Not applicable

Item 8. Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors of
ChromaDex Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of ChromaDex Corporation and Subsidiaries (the "Company") as of December 31, 2022 and 2021, the related consolidated statements of operations, changes in stockholders' equity and cash flows for each of the two years in the period ended December 31, 2022, 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 as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2022, in conformity with accounting principles generally accepted in the United States of America.

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 audits 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.

Critical Audit Matters

Critical audit matters are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. We determined that there are no critical audit matters.

/s/ Marcum LLP

Marcum LLP

We have served as the Company's auditor since 2013.

New York, NY
March 8, 2023

ChromaDex Corporation and Subsidiaries
Consolidated Balance Sheets

	December 31,	
	2022	**2021**
(In thousands, except par values, unless otherwise indicated)		
Assets		
Current assets		
Cash and cash equivalents, including restricted cash of $0.2 million for both periods presented	**$ 20,441**	$ 28,219
Trade receivables, net of allowances of $122 and $65, respectively; Including receivables from Related Party of $3.1 million and $2.1 million, respectively.	**8,482**	5,226
Inventories	**14,677**	13,601
Prepaid expenses and other assets	**2,967**	1,859
Total current assets	**46,567**	48,905
Leasehold improvements and equipment, net	**2,799**	3,003
Intangible assets, net	**671**	857
Right-of-use assets	**3,523**	4,352
Other long-term assets	**497**	723
Total assets	**$ 54,057**	$ 57,840
Liabilities and Stockholders' Equity		
Current liabilities		
Accounts payable	**$ 9,679**	$ 10,423
Accrued expenses	**7,337**	6,481
Current maturities of operating lease obligations	**680**	528
Current maturities of finance lease obligations	**16**	20
Customer deposits	**157**	161
Total current liabilities	**17,869**	17,613
Deferred revenue	**3,955**	4,346
Operating lease obligations, less current maturities	**3,539**	4,154
Finance lease obligations, less current maturities	**22**	—
Total liabilities	**25,385**	26,113
Commitments and Contingencies (Notes 10 and 17)		
Stockholders' Equity		
Common stock, $0.001 par value; authorized 150,000 shares; 74,567 shares and 68,126 shares issued and outstanding at December 31, 2022 and December 31, 2021, respectively.	**74**	68
Additional paid-in capital	**214,094**	200,614
Accumulated deficit	**(185,493)**	(168,953)
Cumulative translation adjustments	**(3)**	(2)
Total stockholders' equity	**28,672**	31,727
Total liabilities and stockholders' equity	**$ 54,057**	$ 57,840

See accompanying notes to consolidated financial statements.

ChromaDex Corporation and Subsidiaries
Consolidated Statements of Operations

	Year Ended December 31,	
	2022	**2021**
(In thousands, except per share data)		
Sales, net	**$ 72,050**	$ 67,449
Cost of sales	**29,253**	25,959
Gross profit	**42,797**	41,490
Operating expenses:		
Sales and marketing	**28,313**	28,352
Research and development	**4,826**	3,832
General and administrative	**28,286**	36,379
Total operating expenses	**61,425**	68,563
Operating loss	**(18,628)**	(27,073)
Nonoperating expenses:		
Other income, net - Employee Retention Tax Credit	**2,085**	**—**
Interest income (expense), net	**3**	(55)
Net loss	**$ (16,540)**	$ (27,128)
Basic and diluted loss per common share	**$ (0.24)**	$ (0.40)
Basic and diluted weighted average common shares outstanding	**69,729**	67,185

See accompanying notes to consolidated financial statements.

ChromaDex Corporation and Subsidiaries
Consolidated Statement of Stockholders' Equity
(In thousands, unless otherwise indicated)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Cumulative Translation Adjustments	Total Stockholders' Equity
	Shares	Amount				
Balance, January 1, 2021	61,881	$ 62	$ 158,190	$ (141,825)	$ (3)	$ 16,424
Issuance of common stock, net of offering costs of $0.4 million	4,059	4	26,736			26,740
Exercise of stock options	2,186	2	9,493	—	—	9,495
Share-based compensation	—	—	6,195	—	—	6,195
Translation adjustment	—	—	—	—	1	1
Net loss	—	—	—	(27,128)		(27,128)
Balance, December 31, 2021	**68,126**	**$ 68**	**$ 200,614**	**$ (168,953)**	**$ (2)**	**$ 31,727**
Issuance of common stock, net of offering costs of $0.4 million	6,297	6	7,741	—	—	7,747
Issuance of restricted stock	144	—	—	—	—	—
Share-based compensation	—	—	5,739	—	—	5,739
Translation adjustment	—	—	—	—	(1)	(1)
Net loss	—	—	—	(16,540)	—	(16,540)
Balance, December 31, 2022	**74,567**	**$ 74**	**$ 214,094**	**$ (185,493)**	**$ (3)**	**$ 28,672**

See accompanying notes to consolidated financial statements.

ChromaDex Corporation and Subsidiaries
Consolidated Statements of Cash Flows
(In thousands, unless otherwise indicated)

	Year Ended December 31,	
	2022	**2021**
Cash Flows From Operating Activities		
Net loss	**$ (16,540)**	$ (27,128)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation of leasehold improvements and equipment	**869**	890
Amortization of intangibles	**186**	225
Amortization of right of use assets	**829**	511
Share-based compensation expense	**5,739**	6,195
Loss on disposal of leasehold improvements and equipment	**7**	—
Provision for doubtful trade receivables	**63**	46
Non-cash financing costs	**67**	108
Changes in operating assets and liabilities:		
Trade receivables	**(3,319)**	(2,578)
Inventories	**(1,076)**	(1,918)
Implementation costs for cloud computing arrangement	**(304)**	(278)
Prepaid expenses and other assets	**(872)**	(810)
Accounts payable	**(744)**	978
Accrued expenses	**856**	348
Deferred revenue	**(391)**	(95)
Customer deposits and other	**(5)**	(116)
Operating lease liabilities	**(463)**	(541)
Net cash used in operating activities	**(15,098)**	(24,163)
Cash Flows From Investing Activities		
Purchases of leasehold improvements and equipment	**(334)**	(409)
Net cash used in investing activities	**(334)**	(409)
Cash Flows From Financing Activities		
Proceeds from issuance of common stock, net	**7,747**	26,740
Proceeds from exercise of stock options	**—**	9,495
Payment of debt issuance costs	**(77)**	(110)
Principal payments on finance leases	**(16)**	(31)
Net cash provided by financing activities	**7,654**	36,094
Net (decrease) increase in cash and cash equivalents	**(7,778)**	11,522
Cash and cash equivalents, including restricted cash of $0.2 million for both 2022 and 2021 - beginning of year	**28,219**	16,697
Cash and cash equivalents, including restricted cash of $0.2 million for both 2022 and 2021 - end of year	**$ 20,441**	$ 28,219
Supplemental Disclosures of Cash Flow Information		
Cash payments for interest on finance leases	**$ 1**	$ 1
Cash payments for principal on operating lease liabilities	**$ 507**	$ 541
Supplemental Schedule of Noncash Operating Activity		
Right-of-use assets and operating lease obligations incurred for entering into lease amendment	**$ —**	$ 3,637
Supplemental Schedule of Noncash Investing Activity		
Financing lease obligation incurred for computer equipment and software	**$ 34**	$ —

See accompanying notes to consolidated financial statements.

Note 1. Nature of Business

ChromaDex Corporation and its wholly owned subsidiaries, ChromaDex, Inc., ChromaDex International, Inc., ChromaDex Analytics, Inc., ChromaDex Asia Limited, Asia Pacific Scientific, Inc., ChromaDex Europa B.V. and ChromaDex Sağlik Ürünleri Anonim Şirketi (collectively, "ChromaDex" or the "Company") are a global bioscience company dedicated to healthy aging. The ChromaDex team, which includes world-renowned scientists, is pioneering research on nicotinamide adenine dinucleotide (NAD+), an essential coenzyme that is a key regulator of cellular metabolism and is found in every cell of the human body. NAD+ levels in humans have been shown to decline with age, among other factors, and may be increased through supplementation with NAD+ precursors.

ChromaDex is the innovator behind the NAD+ precursor nicotinamide riboside (NR), commercialized as the flagship ingredient Niagen®. Nicotinamide riboside and other NAD+ precursors are protected by ChromaDex's patent and/or licensed rights portfolio. The Company delivers Niagen® as the sole active ingredient in its consumer product Tru Niagen®. The Company further develops and commercializes proprietary-based ingredient technologies and supplies these ingredients as raw materials to the manufacturers of consumer products. Additionally, the Company offers natural product fine chemicals, known as phytochemicals, and related research and development services.

Note 2. Summary of Significant Accounting Policies

Basis of Presentation: The financial statements and accompanying notes have been prepared on a consolidated basis and reflect the consolidated financial position of the Company and its wholly owned subsidiaries. All significant intercompany balances and transactions have been eliminated from these financial statements.

Use of Accounting Estimates: The preparation of financial statements requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates.

Revenue Recognition: The Company recognizes sales and the related cost of sales when the performance obligations are satisfied. The performance obligations are typically satisfied upon shipment of physical goods or as the services are performed over time. In addition to the satisfaction of the performance obligations, the following conditions are required for revenue recognition: an arrangement exists, there is a fixed price, and collectability is reasonably assured. Discounts, returns and allowances related to sales, including an estimated reserve for the returns and allowances, are recorded as reduction of revenue.

Whenever the Company determines that goods or services promised in a contract should be accounted for as a combined performance obligation over time, the Company determines the period over which the performance obligations will be performed and revenue will be recognized. If the Company determines that the performance obligation is satisfied over time, any upfront payment received is initially recorded as deferred revenue on its consolidated balance sheets.

Revenue is then recognized utilizing the output method based on an estimated rate to allocate the transaction price for this performance obligation as products are supplied over the duration of the contract. Certain judgments affect the application of the Company's revenue recognition policy. For example, when utilizing the output method, the Company estimates total delivery volume based on the Company's current operating plan, forecast inputs for expected purchases received from the customer, minimum purchase commitments by the customer and historical experience with similar customer contracts. Accordingly, the Company may recognize a different amount of deferred revenue over the next 12-month period if the Company's plan changes in the future or if the customer informs the Company of changes to their expected purchases. As of December 31, 2022 and 2021, the Company held deferred revenue balances of $4.0 million and $4.3 million, respectively.

The Company may periodically enter into bill-and-hold arrangements upon request by certain customers according to the terms in the contract. Under the terms, the customer makes a fixed commitment to purchase the Company's goods, however the customer delays the physical transfer of the goods until a later date. In such instances, revenue is recognized when a customer obtains control of the promised goods and the Company has satisfied all of its performance obligations. The Company considers indicators of the transfer of control, which include, but are not limited to, the following: (i) the Company has a present right to payment for the asset, (ii) the customer has legal title to the asset, (iii) the Company has transferred physical possession of the asset, (iv) the customer has the significant risks and rewards of ownership of the asset and (v) the customer has accepted the asset.

In addition, all of the following criteria in a bill-and-hold arrangement must be met to further indicate a customer has obtained control of the goods: (i) the reason for the bill-and-hold arrangement must be substantive, (ii) the requested goods must be identified separately as belonging to the customer, (iii) the requested goods must be ready for physical transfer to the customer, and (iv) the Company cannot have the ability to use the goods or direct the goods to another customer. Revenue under bill-and-hold arrangements totaled $1.7 million for the year ended December 31, 2022. The company recognized no revenue under bill-and-hold arrangements during the year ended December 31, 2021.

Net sales include the revenue related to shipping and handling charges billed to customers. The related costs associated with shipping and handling is included as a component of cost of goods sold.

Shipping and handling fees billed to customers included in net sales for the periods indicated are as follows:

	Year Ended December 31,	
(In thousands)	**2022**	**2021**
Shipping and handling fees billed	$ 428	$ 336

Taxes collected from customers and remitted to governmental authorities are excluded from revenue, which is presented on a net basis in the statement of operations.

Cash, Cash Equivalents and Restricted Cash: All highly liquid interest-bearing investments with short-terms are classified as cash equivalents. The Company's investments primarily include investments in money market funds managed by banks with maturities of three months or less when purchased. The carrying value of these cash equivalents approximate their fair value.

The Company classifies cash as restricted if the withdrawal or usage is restricted for more than three months. For each of the years ended December 31, 2022 and 2021, there was $0.2 million restricted cash held as collateral associated with letters of credit for the Company's office space in Los Angeles, California. The Los Angeles, California office lease currently expires in March 2027.

Trade Receivables, net: Trade receivables are carried at original invoice amount less an estimate made for doubtful receivables based on monthly and quarterly reviews of all outstanding amounts. Management determines the allowance for doubtful accounts by identifying troubled accounts and using historical experience applied to an aging of accounts. Trade receivables are written off when deemed uncollectible. Recoveries of trade receivables previously written off are recorded when received.

Credit Risk: Financial instruments that potentially expose the Company to concentration of credit risk consist primarily of cash and cash equivalents and trade receivables. Cash and cash equivalents, consist of bank deposits or highly liquid investment-grade debt instruments with an original maturity of three months or less when purchased pursuant to the Company's investment policy. The Company maintains several bank accounts for its operations primarily at three financial institutions in the U.S. and one financial institution in Hong Kong. The Company's U.S. bank accounts are insured by the Federal Deposit Insurance Corporation (FDIC) up to $250,000 at each institution. Management believes the Company is not exposed to significant credit risk due to the financial position of the depository institutions in which these deposits are held. The Company's trade receivables are derived from sales to its customers. The Company assesses credit risk of its customers through quantitative and qualitative analysis. From this analysis, the Company establishes credit limits and manages the risk exposure. The Company, however, may from time-to-time incur credit losses due to bankruptcy or other failures from its customers to pay.

Inventories: Inventories are comprised of work-in-process and finished goods. Inventories are stated at the lower of cost, determined by the first-in, first-out method, or net realizable value. The inventory on the balance sheet is recorded net of valuation allowances. Labor and overhead has been added to inventory that was manufactured or characterized by the Company. The Company's normal operating cycle for reference standards is currently longer than one year. The Company regularly reviews inventories on hand and reduces the carrying value for slow-moving and obsolete inventory, inventory not meeting quality standards and inventory subject to expiration. The reduction of the carrying value for slow-moving and obsolete inventory is based on current estimates of future product demand, market conditions and related management judgment. Any significant unanticipated changes in future product demand or market conditions that vary from current expectations could have an impact on the value of inventories.

Intangible assets: Intangible assets include licensing rights and are accounted for based on the fair value of consideration given or the fair value of the net assets acquired, whichever is more reliable. Intangible assets with finite useful lives are amortized using the straight-line method over a period of 10 years, or, for licensed patent rights, the remaining term of the patents underlying licensing rights (considered to be the remaining useful life of the license), whichever is shorter. The useful lives of subsequent milestone payments that are capitalized are the remaining useful life of the initial licensing payment that was capitalized.

Leasehold Improvements and Equipment, net: Leasehold improvements and equipment are comprised of leasehold improvements, laboratory equipment, furniture and fixtures, computer equipment, construction in progress and implementations costs for cloud computing arrangements. Leasehold improvements and equipment are carried at cost and depreciated on the straight-line method over the lesser of the estimated useful life of each asset or lease term. Implementation costs related to a cloud computing arrangement are deferred or expensed as incurred, in accordance with the Accounting Standards Update (ASU) 2018-15. Depreciation on equipment under finance lease is included with depreciation on owned assets. Maintenance and repairs are charged to operating expenses as incurred. Improvements and betterments, which extend the lives of the assets, are capitalized.

Long-lived assets are reviewed for impairment on a periodic basis and when changes in circumstances indicate the possibility that the carrying amount may not be recoverable. Long-lived assets are grouped at the lowest level for which identifiable cash flows are largely independent of the cash flows of other assets. If the forecast of undiscounted future cash flows is less than the carrying amount of the assets, an impairment charge would be recognized to reduce the carrying value of the assets to fair value. If a possible impairment is identified, the asset group's fair value is measured relying primarily on a discounted cash flow methodology.

Customer Deposits: Customer deposits represent cash received from customers in advance of product shipment or delivery of services.

Income Taxes: Deferred taxes are provided on a liability method whereby deferred tax assets are recognized for deductible temporary differences and operating loss and tax credit carryforwards and deferred liabilities are recognized for taxable temporary differences. Temporary differences are the differences between the reported amounts of assets and liabilities and their tax bases. Deferred tax assets are reduced by a valuation allowance when, in the opinion of management, 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.

The Company has not recorded a reserve for any tax positions for which the ultimate deductibility is highly certain but for which there is uncertainty about the timing of such deductibility. The Company files tax returns in all appropriate jurisdictions, which include a U.S. federal tax return and various state tax returns. Open tax years for these jurisdictions are 2019 to 2022, which statutes expire in 2023 to 2026, respectively. When and if applicable, potential interest and penalty costs are accrued as incurred, with expenses recognized in general and administrative expenses in the statements of operations. As of December 31, 2022, the Company has no liability for unrecognized tax benefits.

Research and Development Costs: Research and development costs consist of direct and indirect costs associated with clinical trials, product development and process development expenses. These costs are expensed as incurred.

Advertising: The Company expenses the production costs of advertising the first time the advertising takes place. Advertising expense for the years ended December 31, 2022 and 2021 were approximately $11.4 million and $12.5 million, respectively.

Share-based Compensation: The Company grants equity awards to recipients through its 2017 Equity Incentive Plan, as amended (the "2017 Plan"), which was approved by stockholders and the Board of Directors. Under the 2017 Plan, the Board of Directors may grant restricted stock or stock options to employees and non-employees. The accounting treatment for share-based payments to employees and non-employees is substantially equivalent. The Company accounts for all share-based compensation costs under the fair value method.

The fair value of the Company's stock options is estimated at the date of grant using the Black-Scholes option valuation model. For the expected term, the Company uses SEC Staff Accounting Bulletin No. 107 simplified method for "plain vanilla" options with following characteristics: (i) the share options are granted at the market price on the grant date; (ii) exercisability is conditional on performing service through the vesting date on most options; (iii) if an employee terminates service prior to vesting, the employee would forfeit the share options; (iv) if an employee terminates service after vesting, the employee would have 30 to 90 days to exercise the share options; and (v) the share options are nontransferable and nonhedgeable. The volatility assumption is based on the historical volatility of the Company's common stock with an equivalent remaining expected term. The dividend yield assumption is based on the Company's history and expectation of future dividend payouts on the common stock. The risk-free interest rate is based on the implied yield available on U.S. treasury zero-coupon issues with an equivalent remaining expected term.

Market conditions that affect vesting of stock options are considered in the grant-date fair value. The issues surrounding the valuation for such awards can be complex and consideration needs to be given for how the market condition should be incorporated into the valuation of the award. The Company considers using other valuation techniques, such as Monte Carlo simulations based on a lattice approach, to value awards with market conditions.

The fair-value of restricted stock unit awards is determined at the grant date and is based on the market price on the grant date.

For option grants and restricted stock unit awards without performance conditions, the Company recognizes compensation expense over the requisite vesting period ratably, recognizing expense for each tranche of each grant starting on the grant date. For stock options that have both service and performance conditions, the Company recognizes compensation expense using the graded attribution method. Compensation expense for stock options with performance conditions is recognized only for those awards expected to vest. The Company recognizes forfeitures when they occur.

Fair Value Measurement: The Company follows the provisions of the accounting standard which defines fair value, establishes a framework for measuring fair value and enhances fair value measurement disclosure. Fair value measurements are based on a three-tier hierarchy that prioritizes the use of observable inputs and minimizes the use on unobservable inputs. These tiers include:

Level 1: Quoted prices (unadjusted) in active markets that are accessible at the measurement date for assets or liabilities. The fair value hierarchy gives the highest priority to Level 1 inputs.
Level 2: Observable prices that are based on inputs not quoted on active markets, but corroborated by market data.
Level 3: Unobservable inputs are used when little or no market data is available. The fair value hierarchy gives the lowest priority to Level 3 inputs.

As of December 31, 2022 and 2021, the Company did not have any Level 2 or Level 3 assets or liabilities.

Financial instruments: The estimated fair value of financial instruments has been determined based on the Company's assessment of available market information and appropriate valuation methodologies. The fair value of the Company's financial instruments that are included in current assets and current liabilities approximates their carrying value due to their short-term nature. The carrying amounts reported in the balance sheet for capital lease obligations are present values of the obligations, excluding the interest portion.

Accounting Standards Recently Issued but Not Yet Adopted by the Company: In June 2016, the Financial Accounting Standards Board issued Accounting Standards Update (ASU) 2016-13, Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments. The standard's main goal is to improve financial reporting by requiring earlier recognition of credit losses on financing receivables and other financial assets in scope. The new guidance represents significant changes to accounting for credit losses: (i) full lifetime expected credit losses will be recognized upon initial recognition of an asset in scope; (ii) the current incurred loss impairment model that recognizes losses when a probable threshold is met will be replaced with the expected credit loss impairment method without recognition threshold; and (iii) the expected credit losses estimate will be based upon historical information, current conditions, and reasonable and supportable forecasts. ASU 2016-13 introduces two distinctive credit loss impairment models: (i) current expected credit loss impairment model (Subtopic 326-20) applicable to financial assets measured at amortized cost; and (ii) available-for-sale debt securities impairment model (Subtopic 326-30). ASU 2016-13 is effective for public entities for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. Public entities that qualify as a smaller reporting company can elect to defer compliance effective for fiscal years beginning after December 15, 2022. The Company is currently evaluating the impact of ASU 2016-13 and anticipates there will be no material impact on the Company's financial position, results of operations and liquidity.

Note 3. Liquidity

Evaluation of Ability to Maintain Current Level of Operations

In connection with the preparation of these financial statements for the year ended December 31, 2022, management evaluated whether there were conditions and events, considered in the aggregate, that raised substantial doubt about the Company's ability to meet its obligations as they became due over the next twelve months from the date of issuance of these financial statements for the fourth quarter of 2022. Management assessed that there were such conditions and events, including a history of recurring operating losses, negative cash flows from operating activities and inflationary pressures and the continued impact of the COVID-19 pandemic. For the year ended December 31, 2022, the Company incurred a net loss of approximately $16.5 million and used net cash in operating activities of $15.1 million. As of December 31, 2022, the Company had unrestricted cash and cash equivalents of $20.3 million which consists of bank deposits or highly liquid investment-grade debt instruments with an original maturity of three months or less.

Management evaluated these conditions and anticipates that its current unrestricted cash and cash equivalents and cash to be generated from net sales will be sufficient to meet its financial obligations as they become due over at least the next twelve months from the issuance date of these financial statements. The Company may, however, seek additional capital within the next twelve months, both to fund its projected operating plans after the next twelve months and/or to fund the Company's longer-term strategic objectives.

The Company has an available line of credit with Western Alliance Bank for up to $10.0 million, subject to certain terms and conditions which as of December 31, 2022 allows for $6.1 million of borrowing. There are no outstanding borrowings as of December 31, 2022. In June 2020, the Company filed a $125 million registration statement on Form S-3 with the SEC, utilizing a "shelf" registration process. Under this shelf registration process, the Company may sell securities from time to time, including up to $50.0 million pursuant to the At Market Issuance Sales Agreement, dated as of June 12, 2020, with B. Riley FBR, Inc. and Raymond James & Associates, Inc. (ATM Facility). As of December 31, 2022, approximately $47.8 million remains available under the ATM Facility. The Company's potential use of the ATM facility is subject to the satisfaction of various conditions in the ATM Facility agreement as well as market conditions. As a result, the Company's ability to rely on the ATM Facility to raise liquidity is limited to a material extent.

Note 4. Loss Per Share Applicable to Common Stockholders

The following table sets forth the computations of loss per share amounts applicable to common stockholders for the periods indicated.

	Year Ended December 31,	
(In thousands, except per share data)	**2022**	**2021**
Net loss	**$ (16,540)**	$ (27,128)
Basic and diluted loss per common share	**$ (0.24)**	$ (0.40)
Basic and diluted weighted average common shares outstanding (1):	**69,729**	67,185
Potentially dilutive securities (2):		
Stock options	**10,438**	10,536
Restricted stock units	**650**	115

(1) Includes approximately 0.2 million nonvested shares of restricted stock for the years ended December 31, 2022 and 2021 which are participating securities that feature voting and dividend rights.
(2) Excluded from the computation of loss per share as their impact is antidilutive.

Note 5. Business Segments and Geographical Distribution

The Company has the following three reportable segments for the years ended December 31, 2022 and 2021:

- *Consumer Products segment:* provides finished dietary supplement products that contain the Company's proprietary ingredients directly to consumers as well as to distributors;
- *Ingredients segment*: develops and commercializes proprietary-based ingredient technologies and supplies these ingredients as raw materials to the manufacturers of consumer products; and
- *Analytical Reference Standards and Services segment:* offers the supply of phytochemical reference standards and other research and development services.

The Company's reportable segments are significant operating segments that offer differentiated services. This structure reflects the Company's current operational and financial management and provides the best structure to maximize the Company's objectives and investment strategy, while maintaining financial discipline. The Company's Chief Executive Officer, who is its chief operating decision maker (CODM), reviews financial information for each operating segment to evaluate performance and allocate resources. The Company evaluates performance and allocates resources based on reviewing gross margin by reportable segment. The Company's CODM does not review assets by segment in his evaluation and therefore assets by segment are not disclosed below. There are no intersegment sales that require elimination. The "Corporate and other" classification includes corporate items not allocated by the Company to each reportable segment.

The following tables set forth financial information by segment:

Year Ended December 31, 2022 *(In thousands)*	**Consumer Products segment**	**Ingredients segment**	**Analytical Reference Standards and Services segment**	**Corporate and other**	**Total**
Net sales	$ 60,110	$ 8,736	$ 3,204	$ —	$ 72,050
Cost of sales	21,726	4,465	3,062	—	29,253
Gross profit	38,384	4,271	142	—	42,797
Operating expenses:					
Sales and marketing	27,661	51	601	—	28,313
Research and development	4,214	612	—	—	4,826
General and administrative	—	—	—	28,286	28,286
Operating expenses	31,875	663	601	28,286	61,425
Operating income (loss)	$ 6,509	$ 3,608	$ (459)	$ (28,286)	$ (18,628)

Year Ended December 31, 2021 *(In thousands)*	**Consumer Products segment**	**Ingredients segment**	**Analytical Reference Standards and Services segment**	**Corporate and other**	**Total**
Net sales	$ 56,705	$ 7,407	$ 3,337	$ —	$ 67,449
Cost of sales	19,864	3,233	2,862	—	25,959
Gross profit	36,841	4,174	475	—	41,490
Operating expenses:					
Sales and marketing	27,821	46	485	—	28,352
Research and development	3,427	405	—	—	3,832
General and administrative	—	—	—	36,379	36,379
Operating expenses	31,248	451	485	36,379	68,563
Operating income (loss)	$ 5,593	$ 3,723	$ (10)	$ (36,379)	$ (27,073)

Disaggregation of revenue

The Company disaggregates its revenue from contracts with customers by type of goods or services for each of its segments, as the Company believes it best depicts how the nature, amount, timing and uncertainty of its revenue and cash flows are affected by economic factors. Disaggregated revenues are as follows:

Year Ended December 31, 2022 *(In thousands)*	**Consumer Products Segment**	**Ingredients Segment**	**Analytical Reference Standards and Services Segment**	**Total**
Tru Niagen®, Consumer Product	$ 60,110	$ —	$ —	$ 60,110
Niagen® Ingredient	—	8,280	—	8,280
Subtotal Niagen® Related	60,110	8,280	—	68,390
Other Ingredients	—	456	—	456
Reference Standards	—	—	3,081	3,081
Consulting and Other	—	—	123	123
Subtotal Other Goods and Services	—	456	3,204	3,660
Total Net Sales	$ 60,110	$ 8,736	$ 3,204	$ 72,050

Year Ended December 31, 2021 *(In thousands)*	**Consumer Products Segment**	**Ingredients Segment**	**Analytical Reference Standards and Services Segment**	**Total**
Tru Niagen®, Consumer Product	$ 56,705	$ —	$ —	$ 56,705
Niagen® Ingredient	—	6,700	—	6,700
Subtotal Niagen® Related	56,705	6,700	—	63,405
Other Ingredients	—	707	—	707
Reference Standards	—	—	3,061	3,061
Consulting and Other	—	—	276	276
Subtotal Other Goods and Services	—	707	3,337	4,044
Total Net Sales	$ 56,705	$ 7,407	$ 3,337	$ 67,449

Net sales from international sources*

	Year Ended December 31,	
(In millions)	**2022**	**2021**
Consumer Products Segment	$ 18.4	$ 18.0
Ingredients Segment	2.1	$ 0.7
Analytical Reference Standards and Services Segment	1.3	$ 1.1
Total net sales from international sources	$ 21.8	$ 19.8

*International sources include Europe, North America, South America, Asia and Oceania.

Long-lived assets

The Company's long-lived assets are located within the United States.

Disclosure of major customers

Major customers are defined as customers whose sales or accounts receivables individually consist of more than 10% of total sales or total trade receivables, respectively. Percentage of revenues from major customers of the Company's consumer products segment for the periods indicated were as follows:

	Year Ended December 31,	
Major Customers	**2022**	**2021**
A.S. Watson Group - Related Party	13.9 %	13.8 %

The percentage of the amounts due from major customers to total accounts receivable, net for the periods indicated were as follows:

	At December 31,	
Major Customers	**2022**	**2021**
A.S. Watson Group - Related Party	36.6 %	39.6 %
Nestlé (NHSc)	23.6 %	*
Life Extension	*	22.1 %
Persona	*	10.3 %

* Represents less than 10%

Disclosure of major vendor

The Company's major vendor who accounted for more than 10% of the Company's total accounts payable is as follows:

	At December 31,	
Major Vendor	**2022**	**2021**
Vendor A	50.1 %	32.1 %

Note 6. Related Party Transactions

A.S. Watson Group is a related party through common ownership of an enterprise that beneficially owns more than 10% of the common stock of the Company. The sale of consumer products and corresponding trade receivables to related parties during the periods indicated are as follows:

	Net Sales		Trade Receivable as of	
	Year Ended December 31,		December 31,	
	2022	**2021**	**2022**	**2021**
A.S. Watson Group	$10.0 million	$9.3 million	$3.1 million	$2.1 million

Note 7. Inventories

The Company's major classes of inventory and corresponding balances for the periods indicated are as follows:

	December 31,	
(In thousands)	**2022**	**2021**
Consumer Products - Finished goods	**$ 7,901**	$ 6,823
Consumer Products - Work-in-process	**2,992**	4,131
Bulk ingredients	**3,284**	2,131
Reference standards	**500**	516
Inventories	**$ 14,677**	$ 13,601

Note 8. Intangible Assets, Net

Intangible assets for the periods indicated consisted of the following:

		December 31,	
(In thousands, except years)	Weighted Average Life (Years)	**2022**	**2021**
Healthspan Research LLC Acquisition	10	**$ 1,346**	$ 1,346
License agreements and other	9	**1,643**	1,643
Less: Accumulated amortization		**(2,318)**	(2,132)
Intangible assets, net		**$ 671**	$ 857

For the years ended December 31, 2022 and 2021, amortization expense was approximately $186,000 and $225,000, respectively.

Estimated amortization expense for each of the years ending December 31 is as follows:

(In thousands)

Year	**Amount**
2023	$ 158
2024	154
2025	151
2026	151
2027	42
Thereafter	15
	$ 671

Note 9. Leasehold Improvements and Equipment, Net

Leasehold improvements and equipment for the periods indicated consisted of the following:

	December 31,	
(In thousands)	**2022**	**2021**
Laboratory equipment	**$ 3,268**	$ 3,281
Leasehold improvements	**2,060**	2,387
Computer equipment	**602**	814
Implementation costs - cloud computing arrangements	**1,075**	771
Furniture and fixtures	**176**	203
Construction in progress	**172**	91
	7,353	7,547
Less: Accumulated depreciation	**(4,554)**	(4,544)
Leasehold improvements and equipment, net	**$ 2,799**	$ 3,003

Depreciation expense on leasehold improvements and equipment for the years ended December 31, 2022 and 2021 was approximately $869,000 and $890,000, respectively. Depreciation is computed using the straight-line method over the estimated useful lives of the depreciable assets (ranging from three to ten years). Leasehold improvements are amortized on a straight-line basis over the shorter of their estimated useful lives or the remaining lease term.

During the year ended December 31, 2022, the Company retired or disposed certain leasehold improvements and equipment resulting in a loss of $7,000. At the time of retirement or disposal, the related cost and accumulated depreciation were removed from the respective accounts.

Note 10. Leases

Operating Leases

As of December 31, 2022 and 2021, the Company had ROU assets of $3.5 million and $4.4 million, respectively, and corresponding operating lease liabilities of $4.2 million and $4.7 million, respectively.

The components of operating lease expense for the periods indicated are as follows:

	Year Ended December 31,	
(In thousands)	**2022**	**2021**
Operating leases		
Operating lease expense	**$ 941**	$ 625
Variable lease expense	**176**	195
Operating lease expense	**1,117**	820
Short-term lease rent expense	**164**	249
Total expense	**$ 1,281**	$ 1,069

As of December 31, 2022, the weighted average remaining lease term for operating leases is 4.5 years and the weighted average discount rate used to determine the operating lease liabilities is 5.8%.

Future minimum lease payments under operating leases as of December 31, 2022 are as follows:

(In thousands)

Year	Amount
2023	$ 843
2024	1,101
2025	1,135
2026	901
2027	491
Thereafter	387
Total	4,858
Less: Present value discount	(639)
Present value of total operating lease liabilities	4,219
Less: Current portion	(680)
Long-term obligations under operating leases	$ 3,539

Note 11. Share-Based Compensation

Equity Plans

The Company grants awards to recipients through the 2017 Equity Incentive Plan, as amended (2017 Plan), which was approved by stockholders and the Board of Directors. The 2017 Plan provided for the issuance of shares that total no more than the sum of (i) 14,500,000 new shares, (ii) approximately 384,000 unallocated shares remaining available for the grant of new awards under the Second Amended and Restated 2007 Equity Incentive Plan, (iii) any returning shares such as forfeited, cancelled, or expired shares and (iv) 500,000 shares pursuant to an inducement award. The number of shares available to be issued under the 2017 Plan will be reduced by (i) one share for each share that relates to an option or stock appreciation right award and (ii) 1.5 shares for each share which relates to an award other than a stock option or stock appreciation right award (a full-value award). As of December 31, 2022, there were approximately 4.0 million remaining shares available for issuance under this plan. Options expire 10 years from the date of grant.

General Vesting Conditions

The Company's stock options and restricted stock unit awards are generally subject to a one-year cliff vesting period after which 1/3rd of the shares vest with the remaining shares vesting ratably each month over a two-year period subject to the passage of time. Beginning in the second quarter of 2022, newly granted restricted stock units are generally subject to a three-year vesting period with 1/3rd vesting per year on the anniversary of the grant date. Certain stock option awards are market or performance based and vest based on certain triggering events established by the Compensation Committee. Certain executive and board member equity awards provide for accelerated vesting if there is a change in control or termination without cause.

Stock Options

The fair value of the Company's stock options that are not market or performance based was estimated at the date of grant using the Black-Scholes based option valuation model. The table below outlines the weighted average assumptions for options granted during the periods indicated:

	Year Ended December 31,	
Weighted Average:	**2022**	**2021**
Expected term (years)	5.8	5.8
Volatility	76.4 %	74.6 %
Risk-free rate	2.3 %	1.0 %
Dividend Yield	0 %	0 %

Service Period Based Stock Options

The majority of options granted by the Company are comprised of service based options. These options vest ratably over the requisite service period of the award.

The following table summarizes activity of service period-based stock options during the periods indicated:

(In thousands except per-share data and remaining contractual term)	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding at December 31, 2020	10,833	$ 3.96	6.8	$ 10,472
Options Granted	1,724	8.67		
Options Exercised	(2,146)	4.34		13,301
Options Forfeited / Expired	(916)	4.83		
Outstanding at December 31, 2021	9,495	$ 4.65	6.5	$ 2,452
Options Granted	2,445	2.41		
Options Exercised	—	—		—
Options Forfeited / Expired	(2,543)	4.11		
Outstanding at December 31, 2022	9,397	$ 4.21	6.2	$ 44 *
Exercisable at December 31, 2022	6,540	$ 4.46	5.0	$ — *

*The aggregate intrinsic values in the table above are based on the Company's stock price of $1.68, which is the closing price of the Company's stock on the last day of business for the year ended December 31, 2022

Performance Based Stock Options

The Company also grants stock option awards that are performance based and vest based on the achievement of certain criteria established by the Compensation Committee. The related performance criteria has passed for these performance based stock options and no further stock options are pending performance determinations. For performance criteria met, the applicable stock options vested and expense was recognized. For performance criteria not met, the compensation expense was not recognized and the applicable stock options were forfeit.

The following table summarizes activity of performance based stock options during the periods indicated:

(In thousands except per-share data and remaining contractual term)	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding at December 31, 2020	81	$ 4.34	3.1	$ 37
Options Granted	—	—		
Options Exercised	(40)	4.34		401
Options Forfeited	—	—		
Outstanding at December 31, 2021	41	$ 4.34	2.1	$ —
Options Granted	—	—		
Options Exercised	—	—		—
Options Forfeited	—	—		
Outstanding and Exercisable at December 31, 2022	41	$ 4.34	1.1	$ — *

*The aggregate intrinsic values in the table above are based on the Company's stock price of $1.68, which is the closing price of the Company's stock on the last day of business for the year ended December 31, 2022.

Market Based Stock Options

The Company grants stock option awards that are market based which have vesting conditions associated with a service condition as well as performance of the Company's stock price.

The following table summarizes activity of market based stock options during the periods indicated:

(In thousands except per-share data and remaining contractual term)	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding at December 31, 2020	1,000	$ 4.24	6.8	$ 560
Options Granted	—	—		
Options Exercised	—	—		—
Options Forfeited	—	—		
Outstanding at December 31, 2021	1,000	$ 4.24	5.8	$ —
Options Granted	—	—		
Options Exercised	—	—		—
Options Forfeited	—	—		
Outstanding and Exercisable at December 31, 2022	1,000	$ 4.24	4.8	$ — *

*The aggregate intrinsic values in the table above are based on the Company's stock price of $1.68, which is the closing price of the Company's stock on the last day of business for the year ended December 31, 2022.

Restricted Stock Units

The following table summarizes activity of restricted stock units during the periods indicated:

(In thousands except per share fair value)	Number of Units	Weighted Average Fair Value
Unvested shares at December 31, 2020	—	$ —
Granted	135	10.29
Vested	—	—
Forfeited	(20)	10.77
Unvested shares at December 31, 2021	115	$ 10.21
Granted	700	2.16
Vested	(144)	5.05
Forfeited	(21)	7.49
Unvested shares at December 31, 2022	650	$ 2.77
Expected to vest as of December 31, 2022	650	$ 2.77

Restricted Stock Awards

The following table summarizes activity of restricted stock awards during the periods indicated:

(In thousands except per share fair value)	Number of Awards	Weighted Average Fair Value
Unvested shares at December 31, 2020	183	$ 3.25
Granted	—	—
Vested	—	—
Forfeited	—	—
Unvested shares at December 31, 2021	183	$ 3.25
Granted	—	—
Vested	—	—
Forfeited	—	—
Unvested shares at December 31, 2022	183	$ 3.25
Expected to vest as of December 31, 2022	183	$ 3.25

Share-based Compensation

Share-based compensation expenses for the years ended December 31, 2022 and December 31, 2021 were as follows:

	Year Ended December 31,	
(In thousands)	**2022**	**2021**
Share-based compensation expense		
Cost of sales	**$ 276**	$ 204
Sales and marketing	**1,519**	1,689
Research and development	**973**	877
General and administrative	**2,971**	3,425
Total	**$ 5,739**	$ 6,195

On August 10, 2022, the Company entered into a separation agreement with Kevin Farr, the Company's former Chief Financial Officer. Pursuant to the terms of the agreement, Mr. Farr received an equity grant of 89,189 restricted stock units vesting fully in 90 days, accelerated vesting of 88,480 stock options that would have otherwise become vested by the one-year anniversary of the termination date and a period of three years after the termination date to exercise any vested stock options, among other terms. The related expense from these awards has been included during the year ended December 31, 2022.

In future periods, the Company expects to recognize approximately $5.4 million and $1.4 million in share-based compensation expense for unvested options and unvested restricted stock units, respectively, that were outstanding as of December 31, 2022. Future share-based compensation expense will be recognized over 1.6 and 1.7 weighted average years for unvested options and restricted stock units, respectively. The Company also has total unrecognized share-based compensation expense of $1.0 million pertaining to the Joint Venture. Such expense will only be recognized if Blue Hat Registration is achieved, the timing of which is uncertain as of December 31, 2022. See Note 12, *Joint Venture* for further discussion.

Note 12. Joint Venture

On September 30, 2022, Asia Pacific Scientific, Inc., an indirect wholly owned subsidiary of the Company, and Hong Kong (China) Taikuk Group Ltd (Taikuk) entered into a shareholders agreement (the "Shareholders Agreement") pursuant to which Taikuk has agreed to contribute $1.0 million (the "Subscription Price") in exchange for an 11% non-voting equity interest in ChromaDex Asia Pacific Ventures Limited, a subsidiary of Asia Pacific Scientific, Inc. (the "Joint Venture" or "JV"). Additionally, the Company shall pay $1.0 million in cash to Taikuk (the "Taikuk Fee") upon the closing of the Shareholders Agreement (the "Closing"). The Company and Taikuk have mutually agreed that no exchange of funds for the Taikuk Fee and Subscription Price was necessary and, accordingly, no cash has or will exchange hands related to these provisions of the Shareholders Agreement. The articles of association of the JV were amended and restated simultaneously with the Closing.

The purpose of the JV is to commercialize Tru Niagen® and other products containing nicotinamide riboside to be developed by the Company in the ordinary course (the "Products") in Mainland China and its territories, excluding Hong Kong, Macau and Taiwan (the "Territory"). The Shareholders Agreement has an initial term of 20 years, unless earlier terminated. The Company indirectly owns an 89% equity interest (and all of the voting interests) in the JV and has the right to elect all three directors of the JV.

Prior to being able to commercialize the Products in the Territory, the JV will have to obtain all applicable regulatory approvals, including "Blue Hat" or health food registration with the Peoples Republic of China State Administration for Market Regulation for Products in the name of the Company or its designee (collectively, the "Blue Hat Registration"). Upon completion of Blue Hat Registration, the Company shall make a payment of $1.0 million in cash to Taikuk (the "Blue Hat Registration Fee"). If the Blue Hat Registration is not obtained within 24 months of the Closing (which may be extended by an additional 12 months upon mutual consent of the parties), the JV may repurchase the 11% non-voting interest purchased by Taikuk for $1 (the "Right of Repurchase"). The Right of Repurchase functions as a performance vesting condition under ASC 718 and the 11% non-voting equity interest is accounted for as nonemployee share-based compensation. The equity interest will only vest if Blue Hat Registration is achieved, at which time the minority interest will be recorded. As of December 31, 2022, it is uncertain when Blue Hat Registration will be achieved. Consequently, no amounts related to the Blue Hat Registration Fee or the 11% non-voting interest have been recognized in the Consolidated Statements of Operations for the year ended December 31, 2022.

The fair value of the 11% non-voting interest and corresponding share-based compensation expense of $1.0 million was determined as of the grant date of September 30, 2022 and based on a discounted cash flow model, which utilizes Level 3, or unobservable, inputs. The most significant of these inputs were the combined weighted averages of the a) discount rate at 27.5%, b) present value of estimated future cash flows of $3.9 million and c) the present value of the terminal value at $5.6 million.

Once Blue Hat Registration is complete and certain distribution agreements relating to the commercialization of the Products in the Territory are assigned and entered into (the "Distribution Agreements"), Taikuk would be entitled to certain royalty payments based on the Company's and the JV's net revenue for sales of the Products in the Territory under the Distribution Agreements. Operating activity under the JV was not material during the year ended December 31, 2022.

Note 13. Line of Credit

On November 12, 2019, the Company entered into a business financing agreement with Western Alliance Bank (Credit Agreement), to establish a formula based revolving credit line. On December 11, 2021, the Company amended the Credit Agreement to increase the aggregate principal amount available to the Company from $7.0 million to $10.0 million subject to the terms and conditions of the agreement, as amended, and extended the maturity date to November 12, 2023. The amendment also reduced the interest rate to be calculated at a floating rate per month equal to (a) the greater of 3.25% per year (previously 4.75% per year) or (ii) the Prime Rate published by The Wall Street Journal, plus (b) 1.50 percentage points, plus an additional 5.00 percentage points during any period that an event of default has occurred and is continuing. As of December 31, 2022, the interest rate was 9.00% and the Company had no outstanding debt under this line of credit arrangement.

If the Company draws from the line of credit, the Company's obligations under the Credit Agreement are secured by a security interest in substantially all of the Company's current and future personal property assets, including intellectual property. Any borrowings, interest or other fees or obligations that the Company owes will become due and payable on the maturity date. The Credit Agreement includes quick ratio and minimum liquidity financial covenants. The Company is also subject to a number of affirmative and restrictive covenants, including covenants regarding delivery of financial statements, maintenance of inventory, payment of taxes, maintenance of insurance, dispositions of property, business combinations or acquisitions and incurrence of additional indebtedness, among other customary covenants. The Company was in compliance with all covenants as of December 31, 2022.

Debt Issuance Costs

For the years ended December 31, 2022 and 2021, the Company incurred debt issuance costs of approximately $77,000 and $110,000, respectively, in connection with this line of credit arrangement and had an unamortized balance of approximately $69,000 as of December 31, 2022. For the line of credit arrangement, the Company elected a policy to keep the debt issuance costs as an asset, regardless of whether an amount is drawn. The remaining unamortized deferred asset will be amortized over the remaining life of the line of credit arrangement.

Note 14. NHSc Revenue

On October 10, 2022, the Company and Société des Produits Nestlé SA, a société anonyme organized under the laws of Switzerland (NHSc), as successor-in-interest to NESTEC Ltd., entered into an amended and restated supply agreement (the "Supply Agreement"), which amends and restates the supply agreement, dated December 19, 2018, entered into by the Company and NESTEC Ltd. Pursuant to the Supply Agreement, NHSc and its affiliates will exclusively purchase nicotinamide riboside chloride (NRCL) from the Company and NHSc and its affiliates will have the non-exclusive right to manufacture, market, distribute, and sell products using NRCL for human use in the (i) medical nutritional, (ii) functional food and beverage and (iii) multi-ingredient dietary supplements categories sold under one of the NHSc brands (the "Approved Products") world-wide, but excluding certain countries and ingredient combinations. The term of the Supply Agreement is five years, unless earlier terminated, and is subject to automatic extensions provided certain minimum purchases by NHSc are met.

As consideration for the rights granted to NHSc under the Supply Agreement, NHSc agreed to an initial purchase commitment of NRCL equal to approximately $2.0 million. During the fourth quarter of 2022, NHSc purchased the full consideration under this commitment, of which $1.7 million relates to a bill-and-hold arrangement. The Supply Agreement also provides for NHSc to pay a royalty to the Company at tiered percentage rates in the low-single digits based on worldwide annual net sales of the Approved Products, subject to certain deductions. Furthermore, the Supply Agreement provides for NHSc to pay the Company two separate one-time milestone payments in the low seven figures depending on whether NHSc achieves certain net sales targets in any contract year. No royalty or milestone payments were received during the year ended December 31, 2022.

Under the Supply Agreement, the Company will continue to recognize the deferred revenue balance received in connection with the original Nestec Ltd. agreement utilizing the output method. Deferred revenue will be recognized by the Company based on the percentage of NRCL kilograms delivered to-date compared to the total forecasted NRCL kilograms to be delivered for the duration of the contract term including renewal options as estimated by the Company. Revenue recognized from deferred revenue and the corresponding deferred revenue balance for the years indicated is as follows:

	Year Ended December 31,		At December 31,	
(In thousands)	2022	2021	2022	2021
Revenue recognized from deferred revenue	$ 391	$ 432		
Deferred revenue balance			$ 3,955	$ 4,346

In addition, in connection with the entry into the Supply Agreement, the Company entered into a Securities Purchase Agreement with NHSc. For further discussion regarding the Securities Purchase Agreement see Note 16, *Stock Issuances*.

Note 15. Income Taxes

A reconciliation of income taxes computed at the statutory federal income tax rate to income taxes as reflected in the financial statements is summarized as follows:

	Year Ended December 31,	
	2022	2021
Federal income tax expense at statutory rate	(21.0)%	(21.0)%
State income tax, net of federal benefit	(5.5)	(4.8)
Permanent differences	3.2	(1.8)
Change in state tax rate	0.3	(0.1)
Changes of state net operating losses	(1.6)	2.8
Change in stock options and restricted stock	7.8	(4.9)
Change in valuation allowance	17.7	29.8
Other	(0.9)	—
Effective tax rate	0.0 %	0.0 %

The Company's deferred tax assets and liabilities for the periods indicated are summarized below:

	December 31,	
(In thousands)	2022	2021
Deferred tax assets:		
Net operating loss carryforward	$ 37,308	$ 36,136
Stock options and restricted stock	4,528	4,805
Interest expense	258	244
Inventory reserve	410	399
Allowance for doubtful accounts	32	17
Accrued expenses	1,654	1,073
Research and development expense	922	—
Deferred revenue	1,050	880
Leasehold improvements and equipment	60	74
Intangibles	104	95
Operating leases	185	85
	46,511	43,808
Less: Valuation allowance	(46,254)	(43,363)
Total deferred tax assets	257	445
Deferred tax liabilities:		
Prepaid expenses	(257)	(445)
Total deferred tax liabilities	(257)	(445)
Net deferred tax assets (liabilities)	$ —	$ —

As of December 31, 2022 and 2021, the Company maintained a full valuation allowance against the entire deferred income tax balance which resulted in an effective tax rate of 0% for both of the years ended December 31, 2022, and 2021. The Company increased its valuation allowance by approximately $2.9 million to $46.2 million as of December 31, 2022 from $43.3 million as of December 31, 2021. For fiscal year 2022, the Company identified no U.S. tax on global intangible low-taxed income (GILTI) due to a loss.

As of December 31, 2022, the Company's net operating loss (NOL) carryforwards for federal and state income tax purposes are approximately $141.9 million and $116.8 million, respectively, portions of which begin to expire in the years ending December 31, 2023 and 2022, respectively. During the year ended December 31, 2022, $46 thousand and $0.5 million of state NOL carryforwards expired and was written-off, respectively. The write-off of state NOL carryforwards was due to the fact the Company no longer has employees in such state. The Company's federal NOL carryforward of $101.9 million generated in tax years beginning after December 31, 2017 may be carried forward indefinitely but the deductibility of such NOL carryforwards in taxable years beginning after December 31, 2020, is limited to 80% of taxable income.

On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) was enacted in response to the COVID-19 pandemic. The CARES Act, among other provisions, increases the limitation on the allowed business interest expense deduction from 30% to 50% of adjusted taxable income for tax years beginning January 1, 2019 and 2020 and allows businesses to immediately expense the full cost of Qualified Improvement Property, retroactive to tax years beginning on or after January 1, 2018. Additionally, the CARES Act permits NOL carryforwards and carrybacks to offset 100% of taxable income for taxable years beginning before 2021. In addition, the CARES Act allows NOLs incurred in 2018, 2019, and 2020 to be carried back to each of the five preceding taxable years to generate a refund of previously paid income taxes. The CARES Act has not materially impacted the Company's income tax provision.

Under the Internal Revenue Code of 1986, as amended (the Code), certain ownership changes may subject the Company to annual limitations on the utilization of its net operating loss carryforwards. The Company determined that stock issued during fiscal year 2022 did not create a change in control under the Section 382 of the Code. The Company will continue to analyze the potential impact of any additional transactions undertaken upon the utilization of the net operating losses on a go forward basis.

The Company is currently not under examination by the Internal Revenue Service or any other major income tax jurisdiction. The Company has not identified any material uncertain tax positions requiring a reserve as of December 31, 2022 or December 31, 2021.

Note 16. Stock Issuances

On September 30, 2022, the Company entered into a Securities Purchase Agreement with Pioneer Step Holdings Limited (Pioneer Step), Champion River Ventures Limited (Champion) and Robert Fried (collectively, the "Purchasers") pursuant to which the Company agreed to sell and issue approximately 2.5 million shares of common stock at a price of $1.25 per share (the "2022 Financing"). Champion is indirectly owned by Li Ka-Shing and Pioneer Step is indirectly owned by Solina Chau, and each of Mr. Ka-Shing and Ms. Chau own through affiliated entities more than 5% of the Company's common stock. Pursuant to previous agreements, each of Pioneer Step and Champion have appointed a member of the Company's Board. Mr. Fried is the Company's Chief Executive Officer. The transaction and related agreements were approved by the Audit Committee of the Board in accordance with the Company's Related-Persons Transaction Policy. On October 7, 2022, the Company closed the 2022 Financing and received proceeds of approximately $2.9 million, net of offering costs of $0.2 million.

In connection with the 2022 Financing, on September 30, 2022, the Company also entered into a Registration Rights Agreement with the Purchasers (the "Registration Rights Agreement"), pursuant to which the Company agreed to (i) file one or more registration statements with the SEC to cover the resale of the shares of Common Stock issued to the Purchasers, (ii) use reasonable best efforts to have all such registration statements declared effective within the timeframes set forth in the Registration Rights Agreement, and (iii) use commercially reasonable efforts to keep such registration statements effective during the timeframes set forth in the Registration Rights Agreement. The Company filed a Registration Statement registering the resale of Common Stock in November 2022. In the event that such registration statement subsequently becomes unavailable, or the Purchasers are unable to sell the shares of Common Stock issued pursuant to the Financing due to failure by the Company to satisfy the current public information requirement of Rule 144 under the Securities Act, the Company would be required to pay liquidated damages to the Purchasers equal to 1.0% of the aggregate purchase price per month for each default (up to a maximum of 5.0% of such aggregate purchase price).

On October 10, 2022, in connection with the entry into the NHSc Supply Agreement, the Company also entered into a Securities Purchase Agreement with NHSc pursuant to which NHSc agreed to purchase 3.8 million shares of common stock at a price of $1.31 which is equal to the volume weighted average price of the Company's common stock for the 10 trading days preceding October 10, 2022 (the "Securities Purchase Agreement"). On October 17, 2022, the Company closed the Securities Purchase Agreement and received proceeds of approximately $4.8 million, net of offering costs of $0.2 million.

Note 17. Commitments and Contingencies

Purchase obligations

From time to time, the Company enters into purchase obligations with vendors for goods and services required in its operations, primarily consisting of inventory. Future minimum payments under inventory purchase obligations as of December 31, 2022 are as follows:

(In thousands)

Year	Amount
2023	$ 18,000
	$ 18,000

Royalty

The Company has various licensing agreements with leading research universities and other patent holders, pursuant to which the Company acquired patents related to certain products the Company offers to its customers. These agreements afford for royalty payments based on contractual minimums and expire at various dates ranging from 2025 through 2037, often correlated to the expiration date of each patent. In addition, the Company is required to pay a range of 1% to 5% of sales related to the licensed products under these agreements. Total royalty expenses including license maintenance fees for the years ended December 31, 2022 and 2021 were approximately $2.0 million and $1.8 million, respectively, under these agreements.

As of December 31, 2022, future minimum royalties including license maintenance fees for the next five years are as follows:

(In thousands)

Year	Amount
2023	$ 415
2024	426
2025	413
2026	364
2027	174
	$ 1,792

Legal proceedings

1. Elysium Health, LLC

(A) California Action

On December 29, 2016, ChromaDex filed a complaint in the United States District Court for the Central District of California, naming Elysium Health, Inc. (together with Elysium Health, LLC, “Elysium”) as defendant (Complaint). On January 25, 2017, Elysium filed an answer and counterclaims in response to the Complaint (together with the Complaint, the “California Action”). Over the course of the California Action, the parties have each filed amended pleadings several times and have each engaged in several rounds of motions to dismiss and one round of motion for judgment on the pleadings with respect to various claims. Most recently, on November 27, 2018, ChromaDex filed a fifth amended complaint that added an individual, Mark Morris, as a defendant. Elysium and Morris (Defendants) moved to dismiss on December 21, 2018. The court denied Defendants’ motion on February 4, 2019. Defendants filed their answer to ChromaDex’s fifth amended complaint on February 19, 2019. ChromaDex filed an answer to Elysium’s restated counterclaims on March 5, 2019. Discovery closed on August 9, 2019.

On August 16, 2019, the parties filed motions for partial summary judgment as to certain claims and counterclaims. The parties filed opposition briefs on August 28, 2019, and reply briefs on September 4, 2019. On October 9, 2019, among other things, the court vacated the previously scheduled trial date, ordered supplemental briefing with respect to certain issues related to summary judgment. Elysium filed its opening supplemental brief on October 30, 2019, ChromaDex filed its opening supplemental brief on November 18, 2019, and Elysium filed a reply brief on November 27, 2019, and the court heard argument on January 13, 2020. On January 16, 2020, the court granted both parties' motions for summary judgment in part and denied both in part. On ChromaDex's motion, the court granted summary judgment in favor of ChromaDex on Elysium's counterclaims for (i) breach of contract related to manufacturing NIAGEN® according to the defined standard, selling NIAGEN and ingredients that are substantially similar to pterostilbene to other customers, distributing the NIAGEN® product specifications, and failing to provide information concerning the quality and identity of NIAGEN®, and (ii) breach of the implied covenant of good faith and fair dealing. The court denied summary judgment on Elysium's counterclaims for (i) fraudulent inducement of the Trademark License and Royalty Agreement, dated February 3, 2014, by and between ChromaDex and Elysium (License Agreement), (ii) patent misuse, and (iii) unjust enrichment. On Elysium's motion, the court granted summary judgment in favor of Elysium on ChromaDex's claim for damages related to $110,000 in avoided costs arising from documents that Elysium used in violation of the Supply Agreement, dated February 3, 2014, by and between ChromaDex and Elysium, as amended (NIAGEN® Supply Agreement). The court denied summary judgment on Elysium's counterclaim for breach of contract related to certain refunds or credits to Elysium. The court also denied summary judgment on ChromaDex's breach of contract claim against Morris and claims for disgorgement of $8.3 million in Elysium's resale profits, $600,000 for a price discount received by Elysium, and $684,781 in Morris's compensation.

Following the court's January 16, 2020 order, ChromaDex's claims asserted in the California Action, among other allegations, were that (i) Elysium breached the Supply Agreement, dated June 26, 2014, by and between ChromaDex and Elysium (pTeroPure® Supply Agreement), by failing to make payments to ChromaDex for purchases of pTeroPure® and by improper disclosure of confidential ChromaDex information pursuant to the pTeroPure® Supply Agreement, (ii) Elysium breached the NIAGEN® Supply Agreement, by failing to make payments to ChromaDex for purchases of NIAGEN®, (iii) Defendants willfully and maliciously misappropriated ChromaDex trade secrets concerning its ingredient sales business under both the California Uniform Trade Secrets Act and the Federal Defend Trade Secrets Act, (iv) Morris breached two confidentiality agreements he signed by improperly stealing confidential ChromaDex documents and information, (v) Morris breached his fiduciary duty to ChromaDex by lying to and competing with ChromaDex while still employed there, and (vi) Elysium aided and abetted Morris's breach of fiduciary duty. ChromaDex sought damages and interest for Elysium's alleged breaches of the NIAGEN® Supply Agreement and pTeroPure® Supply Agreement and Morris's alleged breaches of his confidentiality agreements, compensatory damages and interest, punitive damages, injunctive relief, and attorney's fees for Defendants' alleged willful and malicious misappropriation of ChromaDex's trade secrets, and compensatory damages and interest, disgorgement of all benefits received, and punitive damages for Morris's alleged breach of his fiduciary duty and Elysium's aiding and abetting of that alleged breach.

Elysium's claims alleged in the California Action were that (i) ChromaDex breached the NIAGEN® Supply Agreement by not issuing certain refunds or credits to Elysium, (ii) ChromaDex fraudulently induced Elysium into entering into the License Agreement, (iv) ChromaDex's conduct constitutes misuse of its patent rights, and (v) ChromaDex was unjustly enriched by the royalties Elysium paid pursuant to the License Agreement. Elysium sought damages for ChromaDex's alleged breaches of the NIAGEN® Supply Agreement, and compensatory damages, punitive damages, and/or rescission of the License Agreement and restitution of any royalty payments conveyed by Elysium pursuant to the License Agreement, and a declaratory judgment that ChromaDex has engaged in patent misuse.

On January 17, 2020, Elysium moved to substitute its counsel. The same day, the court ordered hearing on that motion for January 21, 2020, and granted Elysium's motion at the hearing. On January 23, 2020, the court issued a scheduling order that, among other things, set trial on the remaining claims to begin on May 12, 2020. On March 19, 2020, in light of the global 2019 coronavirus disease (COVID-19) pandemic and ongoing private mediation efforts, the parties jointly stipulated to adjourn the trial date. The court vacated the trial date on March 20, 2020. The court held a telephonic status conference on June 9, 2020, during which the court indicated that it will reschedule the jury trial as soon as conditions permit. On November 4, 2020, the parties submitted a joint status report indicating that they will propose a new trial date as soon as the court announces that it will resume jury trials. On November 18, 2020, the court set trial to begin on September 21, 2021.

On December 11, 2020, Elysium filed a "Notice of Correction of Depositions" related to the depositions of its chief executive officer, Eric Marcotulli, and chief operating officer, Daniel Alminana, both taken in March 2019. On March 8, 2021, based in part on information that Elysium submitted under seal with that notice, ChromaDex filed a motion for sanctions or, in the alternative, reconsideration of the court's January 16, 2020 order regarding summary judgment, in which ChromaDex moved to dismiss Elysium's third, fourth, and fifth counterclaims. Elysium's opposition brief was filed on March 22, 2021. ChromaDex filed its reply brief on March 29, 2021. On April 27, 2021, the court denied ChromaDex, Inc's motion for terminating sanctions, but concluded that the evidence at issue in the motion will be admissible at trial.

The jury trial portion of the case commenced on September 21, 2021. The jury returned a verdict on September 27, 2021. The verdict found (i) Elysium liable for breaches of the NIAGEN® and pTeroPure® Supply Agreements for failing to pay for purchases of the ingredients totaling approximately $3.0 million, (ii) Mark Morris liable for breach of a confidentiality agreement, requiring him to disgorge approximately $17,307, (iii) ChromaDex liable for breaching the NIAGEN® Supply Agreement for not issuing certain refunds or credits to Elysium in the amount of $625,000, and (iv) ChromaDex liable for fraudulent inducement of the Licensing Agreement in the amount of $250,000, along with $1,025,000 in punitive damages arising from the same counterclaim. On January 17, 2022, ChromaDex filed a motion for prejudgment interest on the approximately $3.0 million in damages awarded by the jury for Elysium's breaches of the NIAGEN® and pTeroPure® Supply Agreements. Elysium's opposition brief was filed on January 24, 2022, and ChromaDex, Inc.'s reply brief was filed on January 31, 2022. On February 10, 2022, the court denied ChromaDex Inc.'s motion for prejudgment interest.

On February 18, 2022, ChromaDex, Inc. and Elysium jointly filed a notice informing the court that ChromaDex, Inc. had filed in the U.S. District Court for the Southern District of New York (SDNY Court) a motion to enforce a settlement agreement between ChromaDex, Inc. and Elysium that ChromaDex, Inc. asserts would materially affect the California Action. On April 22, 2022, ChromaDex, Inc. and Elysium jointly filed a notice informing the court that the SDNY Court had granted ChromaDex, Inc.'s motion to enforce the settlement agreement. On April 29, 2022, ChromaDex, Inc. filed a notice informing the court that the SDNY Court had dismissed the SDNY action with prejudice pursuant to the settlement agreement. On August 22, 2022, ChromaDex, Inc. filed a motion for entry of judgment pursuant to Federal Rule of Civil Procedure 54(b) on the basis that the settlement agreement was enforceable and resolved the claims and counterclaims tried to the jury in the California Action. Elysium's opposition brief was filed on August 29, 2022, and ChromaDex, Inc.'s reply brief was filed on September 2, 2022. On September 13, 2022, the court denied ChromaDex, Inc.'s motion for entry of judgment pursuant to Rule 54(b).

On September 28, 2022, ChromaDex, Inc., Elysium, and Mark Morris filed a joint stipulation requesting that the court stay the California Action pending the final resolution of ChromaDex, Inc.'s appeal in the U.S. Court of Appeals for the Federal Circuit captioned ChromaDex, Inc. v. Elysium Health, Inc., No. 2022-1116 (the "Federal Circuit Appeal"). On September 28, 2022, the court issued an order staying the California Action pending the final resolution of the Federal Circuit Appeal.

(B) Southern District of New York Action

On September 27, 2017, Elysium Health Inc. (Elysium Health) filed a complaint in the United States District Court for the Southern District of New York, against ChromaDex (Elysium SDNY Complaint). Elysium Health alleged in the Elysium SDNY Complaint that ChromaDex made false and misleading statements in a citizen petition to the Food and Drug Administration it filed on or about August 18, 2017. Among other allegations, Elysium Health averred that the citizen petition made Elysium Health's product appear dangerous, while casting ChromaDex's own product as safe. The Elysium SDNY Complaint asserted four claims for relief: (i) false advertising under the Lanham Act, 15 U.S.C. § 1125(a); (ii) trade libel; (iii) deceptive business practices under New York General Business Law § 349; and (iv) tortious interference with prospective economic relations. On October 26, 2017, ChromaDex moved to dismiss the Elysium SDNY Complaint on the grounds that, inter alia, its statements in the citizen petition are immune from liability under the Noerr-Pennington Doctrine, the litigation privilege, and New York's Anti-SLAPP statute, and that the Elysium SDNY Complaint failed to state a claim. Elysium Health opposed the motion on November 2, 2017. ChromaDex filed its reply on November 9, 2017.

On October 26, 2017, ChromaDex filed a complaint in the United States District Court for the Southern District of New York against Elysium Health (ChromaDex SDNY Complaint). ChromaDex alleges that Elysium Health made material false and misleading statements to consumers in the promotion, marketing, and sale of its health supplement product, Basis, and asserts five claims for relief: (i) false advertising under the Lanham Act, 15 U.S.C. §1125(a); (ii) unfair competition under 15 U.S.C. § 1125(a); (iii) deceptive practices under New York General Business Law § 349; (iv) deceptive practices under New York General Business Law § 350; and (v) tortious interference with prospective economic advantage. On November 16, 2017, Elysium Health moved to dismiss for failure to state a claim. ChromaDex opposed the motion on November 30, 2017 and Elysium Health filed a reply on December 7, 2017.

On November 3, 2017, the Court consolidated the Elysium SDNY Complaint and the ChromaDex SDNY Complaint actions under the caption In re Elysium Health-ChromaDex Litigation, 17-cv-7394, and stayed discovery in the consolidated action pending a Court-ordered mediation. The mediation was unsuccessful. On September 27, 2018, the Court issued a combined ruling on both parties' motions to dismiss. For ChromaDex's motion to dismiss, the Court converted the part of the motion on the issue of whether the citizen petition is immune under the Noerr-Pennington Doctrine into a motion for summary judgment, and requested supplemental evidence from both parties, which were submitted on October 29, 2018. The Court otherwise denied the motion to dismiss. On January 3, 2019, the Court granted ChromaDex's motion for summary judgment under the Noerr-Pennington Doctrine and dismissed all claims in the Elysium SDNY Complaint. Elysium moved for reconsideration on January 17, 2019. The Court denied Elysium's motion for reconsideration on February 6, 2019, and issued an amended final order granting ChromaDex's motion for summary judgment on February 7, 2019.

The Court granted in part and denied in part Elysium's motion to dismiss, sustaining three grounds for ChromaDex's Lanham Act claims while dismissing two others, sustaining the claim under New York General Business Law § 349, and dismissing the claims under New York General Business Law § 350 and for tortious interference. Elysium filed an answer and counterclaims on October 10, 2018, alleging claims for (i) false advertising under the Lanham Act, 15 U.S.C. §1125(a); (ii) unfair competition under 15 U.S.C. § 1125(a); and (iii) deceptive practices under New York General Business Law § 349. ChromaDex answered Elysium's counterclaims on November 2, 2018.

ChromaDex filed an amended complaint on March 27, 2019, adding new claims against Elysium Health for false advertising and unfair competition under the Lanham Act, 15 U.S.C. § 1125(a). On April 10, 2019, Elysium Health answered the amended complaint and filed amended counterclaims, also adding new claims against ChromaDex for false advertising and unfair competition under the Lanham Act, 15 U.S.C. § 1125(a). On July 1, 2019, Elysium Health filed further amended counterclaims, adding new claims under the Copyright Act §§ 106 & 501. On February 9, 2020, ChromaDex filed a motion for leave to amend its complaint to add additional claims against Elysium Health for false advertising and unfair competition. On February 10, 2020, Elysium Health filed a motion for leave to amend its counterclaims to identify allegedly false and misleading statements in ChromaDex's advertising. Those motions were both granted after respective stipulations. On March 12, 2020, Elysium Health answered the second amended complaint. On March 13, 2020, ChromaDex filed an answer and objection to Elysium Health's third amended counterclaims.

On December 14, 2020, Elysium Health filed a motion to supplement and amend its counterclaims to add claims regarding alleged advertising related to COVID-19, to add an allegation about a change to the ChromaDex website, and to remove its copyright infringement claim under the Copyright Act. On January 19, 2021, the Court denied Elysium Health's motion to add claims regarding alleged advertising related to COVID-19. The Court granted the unopposed requests to add an allegation about a change to ChromaDex's website and to remove Elysium's Copyright Act claim. Pursuant to the Court's order, Elysium filed fourth amended counterclaims on April 21, 2021.

All discovery closed on April 23, 2021. The Court vacated a previously scheduled joint pretrial order and trial date because of COVID-19, and the Court has informed the Parties that trial date will be rescheduled in November or December 2021.

Both parties filed dispositive and *Daubert* motions on June 4, 2021. Opposition papers were filed by both parties on June 25, 2021, and reply papers were filed on July 9, 2021. On January 10, 2022, both parties appeared for oral argument on the dispositive and *Daubert* motions.

On February 3, 2022, ChromaDex reached a settlement in order to resolve the SDNY action in its entirety as well as the claims tried to the jury in the Central District of California (the "Settlement Agreement"). Shortly thereafter, before the parties could notify the Court, the Court issued a ruling on the pending dispositive and *Daubert* motions, dismissing ChromaDex's SDNY complaint in its entirety on the grounds that ChromaDex's damages were uncertain, and dismissing some of Elysium's claims. Elysium then asserted that a settlement had not been reached. ChromaDex thereafter filed a motion to enforce the Settlement Agreement in its entirety on February 16, 2022. Elysium's opposition to that motion was filed on March 2, 2022, and ChromaDex's reply was filed on March 9, 2022. On April 19, 2022, the Court concluded that a settlement had been reached and granted ChromaDex's motion to enforce the Settlement Agreement. On April 28, 2022, pursuant to the Settlement Agreement, the Court dismissed the entire action with prejudice. On May 11, 2022, Elysium filed a notice of appeal. On May 25, 2022, ChromaDex filed a notice of cross-appeal. Elysium filed its opening brief on August 24, 2022. ChromaDex filed its opening and response brief on November 22, 2022. Elysium filed its reply and response brief on January 20, 2023. ChromaDex filed its reply brief on February 10, 2023.

The Company is unable to predict the outcome of the Elysium SDNY Complaint and, at this time, cannot reasonably estimate the possible loss or range of loss with respect to the legal proceeding discussed herein. As of December 31, 2022, ChromaDex did not accrue a potential loss for the Elysium SDNY Complaint because ChromaDex believes that the allegations are without merit and thus it is not probable that a liability has been incurred.

(C) Delaware - Patent Infringement Action

On September 17, 2018, ChromaDex and Trustees of Dartmouth College filed a patent infringement complaint in the United States District Court for the District of Delaware against Elysium Health, Inc. The complaint alleges that Elysium's BASIS® dietary supplement infringes U.S. Patent Nos. 8,197,807 ('807 Patent) and 8,383,086 ('086 Patent) that comprise compositions containing isolated nicotinamide riboside held by Dartmouth and licensed exclusively to ChromaDex On October 23, 2018, Elysium filed an answer to the complaint. The answer asserts various affirmative defenses and denies that Plaintiffs are entitled to any relief.

On November 7, 2018, Elysium filed a motion to stay the patent infringement proceedings pending resolution of (1) the inter partes review of the '807 Patent and the '086 Patent before the Patent Trial and Appeal Board (PTAB) and (2) the outcome of the litigation in the California Action. ChromaDex filed an opposition brief on November 21, 2018 detailing the issues with Elysium's motion to stay. In particular, ChromaDex argued that given claim 2 of the '086 Patent was only included in the PTAB's inter partes review for procedural reasons the PTAB was unlikely to invalidate claim 2 and therefore litigation in Delaware would continue regardless. In addition, ChromaDex argued that the litigation in the California Action is unlikely to have a significant effect on the ongoing patent litigation. After the PTAB released its written decision upholding claim 2 of the '086 Patent, proving right ChromaDex's prediction, ChromaDex informed the Delaware court of the PTAB's decision on January 17, 2019. On June 19, 2019, the Delaware court granted in part and denied in part Elysium's motion, ordering that the case was stayed pending the resolution of Elysium's patent misuse counterclaim in the California Action.

On November 1, 2019, ChromaDex filed a motion to lift the stay due to changed circumstances in the California Action, among other reasons. Briefing on the motion was completed on November 22, 2019. On January 6, 2020, the Delaware court issued an oral order instructing the parties to submit a joint status report after the January 13, 2020 motions hearing in the California Action. The joint status report was submitted on January 30, 2020. On February 4, 2020, the Delaware court issued an order granting ChromaDex's motion to lift the stay and setting a scheduling conference for March 10, 2020. On March 19, 2020, the Delaware court entered a scheduling order, which, among other things, set the claim-construction hearing for December 17, 2020 and trial for the week of September 27, 2021. On April 17, 2020, ChromaDex served infringement contentions. Elysium filed a Second Amended Answer on July 10, 2020.

On April 24, 2020, ChromaDex moved for leave to amend the complaint to add Healthspan Research, LLC as a plaintiff. On May 5, 2020, Elysium filed its opposition to ChromaDex's motion for leave to amend and moved to dismiss ChromaDex for alleged lack of standing. ChromaDex filed its opposition to Elysium's motion to dismiss and reply in support of its motion to amend on May 19, 2020. Elysium filed its reply in support of its motion to dismiss on May 26, 2020. The Court held a hearing on the motion for leave to amend the complaint and Elysium's motion to dismiss on September 16, 2020. On December 15, 2020, the Court entered orders (i) granting in part and denying in part Elysium's motion to dismiss ChromaDex for alleged lack of standing; and (ii) denying ChromaDex's motion for leave to amend. ChromaDex filed a motion for reargument on December 29, 2020. Elysium filed a response to the motion for reargument on January 28, 2021. ChromaDex filed a motion for leave to file a reply on February 8, 2021. Elysium filed a response to the motion for leave to file a reply on February 12, 2021. ChromaDex filed a reply to the motion for leave to file a reply on February 19, 2021. The Court granted the motion for leave to file the reply on April 26, 2021 and denied the motion for reargument on April 27, 2021.

On July 22, 2020, the parties filed a Joint Claim Construction Chart and respective motions for claim construction. The parties filed a Joint Claim Construction Brief on November 5, 2020. The Court held a Markman hearing on claim-construction issues on December 17, 2020. The Court entered a claim-construction ruling on January 5, 2021.

Fact discovery closed on January 26, 2021. Opening expert reports were served on February 9, 2021. Responsive expert reports were served on March 9, 2021. Reply expert reports were served on March 30, 2021. Both parties filed dispositive and *Daubert* motions on April 27, 2021.

On September 21, 2021, the Court granted Elysium's motion for summary judgment that the claims of the '807 and '086 patents are invalid based on patent-ineligible subject matter. ChromaDex filed a notice of appeal on November 2, 2021. ChromaDex's opening brief was filed on February 2, 2022. Elysium's response brief was filed on April 11, 2022. ChromaDex's reply brief was filed on May 9, 2022. Oral argument occurred on December 6, 2022. On February 13, 2023, the court of appeals issued a decision affirming the district court's decision. The deadline to file a petition for a panel rehearing and/or rehearing en banc is March 15, 2023. The Company does not believe that this decision will have a material impact on the Company's NR business.

2. Thorne Research, Inc.

(A) Inter Partes Review Proceedings

On or around September 28, 2020, Thorne Research, Inc. (Thorne) provided notice to ChromaDex that it intended to terminate its March 25, 2019 Supply Agreement and subsequent amendments with ChromaDex, effective as of December 31, 2020. A discussion between ChromaDex and Thorne followed, and Thorne asserted that it could challenge the '086 Patent in an inter partes review (IPR) proceeding on the basis of prior art, but would be willing to enter into a mutual existence agreement that would permit Thorne to source NR from a third party. Thorne did not offer substantive information supporting a prior art claim or about the nature of the threatened IPR.

On December 1, 2020, Thorne filed a petition for IPR of the '086 Patent. Dartmouth's preliminary response to the petition was filed on March 15, 2021. On June 10, 2021, the Patent Trial and Appeal Board (PTAB) issued a decision instituting an IPR on the '086 Patent. On September 21, 2021, Dartmouth filed its Patent Owner Response. On December 21, 2021, Thorne filed its reply. Oral argument was held on March 15, 2022. On May 31, 2022, the PTAB issued a final written decision holding that the challenged claim was unpatentable. On August 2, 2022, Dartmouth filed a notice of appeal. On December 29, 2022, the parties filed a joint stipulation to dismiss the appeal. On January 3, 2023, the appeal was dismissed.

On February 1, 2021, Thorne filed a petition for IPR of the '807 Patent. Dartmouth's preliminary response to the petition was filed on May 18, 2021. On August 12, 2021, the Patent Trial and Appeal Board (PTAB) issued a decision instituting an IPR on the '807 Patent. On November 9, 2021, Dartmouth filed its Patent Owner Response. On February 15, 2022, Thorne filed its reply. Oral argument was held on May 17, 2022. On August 10, 2022, the PTAB issued a final written decision holding that the challenged claims were not unpatentable. On October 12, 2022, Thorne filed a notice of appeal. Thorne's opening brief is currently due on March 16, 2023.

(B) Southern District of New York – Patent Infringement Action

On May 12, 2021, ChromaDex and Trustees of Dartmouth College filed a patent infringement complaint in the United States District Court for the Southern District of New York. The complaint alleges that certain of Thorne's dietary supplements containing isolated NR infringe the '807 and '086 Patents, which claim compositions containing isolated nicotinamide riboside and are held by Dartmouth and licensed exclusively to ChromaDex. On July 6, 2021, Thorne filed an answer and counterclaims to the complaint. The answer asserts various affirmative defenses and denies that Plaintiffs are entitled to any relief. The counterclaims seek declaratory judgment of patent invalidity for the '807 and '086 Patents. On July 8, 2021, the parties filed a proposed stipulation and order staying the matter pending issuance of the institution decision in the '807 Patent IPR. On July 9, 2021, the Court granted the stipulation and order to stay. On August 19, 2021, the parties filed a proposed stipulation and order staying the matter pending issuance of final written decisions in the IPRs. On August 20, 2021, the Court granted the stipulation and order to stay. On August 24, 2022, the parties filed a status report agreeing to continue to stay until fourteen days after the deadline to appeal the final written notice decision in the '807 Patent IPR. On October 26, 2022, the parties filed a further status report agreeing to continue the stay through resolution of the appeals.

3. Contingencies

(A) In September 2019, the Company received a letter from a licensor stating that the Company owed the licensor $1.6 million plus interest for sublicense fees as a result of the Company entering into a supply agreement with a customer. After reviewing the relevant facts and circumstances, the Company believes that the Company does not owe any sublicense fees to the licensor and has corresponded with the licensor to resolve the matter. The Company does not believe that the ultimate resolution of this matter will be material to the Company's results of operations, financial condition or cash flows.

(B) On November 17, 2020, the Company received a warning letter (the Letter) from the United States Food and Drug Administration (FDA) and Federal Trade Commission (FTC). The Letter references statements issued by the Company relating to preclinical and clinical research results involving nicotinamide riboside and COVID-19. The statements were included in press releases and referenced in social media posts.

On November 18, 2020, the Company provided a response to the Letter stating that the Company disagrees with the assertion in the Letter that the Company's products are intended to mitigate, prevent, treat, diagnose or cure COVID-19 in violation of certain sections of the Federal Food, Drug, and Cosmetic Act or that they were unsubstantiated under the FTC Act, but rather accurately reflected the state of the science and the results of scientific research. Nonetheless, the Company also responded that it had deleted social media references to the studies and removed related press releases from its website.

On April 30, 2021, the Company received an additional warning letter (the Second Letter) from only the FTC. The Second Letter references the original Letter, and cites additional statements issued by the Company and certain officers and advisors of the Company relating to nicotinamide riboside and scientific studies related to COVID-19. The Second Letter asserts that such statements contain coronavirus-related prevention or treatment claims and are deceptive in violation of the Federal Trade Commission Act.

On May 4, 2021, the Company provided a response to the Second Letter stating that it had removed the social media posts from its accounts identified in the Second Letter and requested that third parties remove the post from their accounts that were identified in the Second Letter. The Company stated that the press release identified in the Second Letter is appropriate and not a deceptive act or practice under applicable law. The Company affirmed its belief in the need to accurately report on the scientific results of its studies to its investors and welcomed the opportunity to discuss its research and development program with the FTC and receive guidance on future releases.

The Company does not believe that the ultimate resolution of this matter will be material to the Company's results of operations, financial condition or cash flows.

Note 18. Employee Retention Tax Credit

In March 2020, the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) was signed into law, providing numerous tax provisions and other stimulus measures, including the Employee Retention Tax Credit (ERTC): a refundable tax credit against certain employment taxes for qualifying businesses keeping employees on their payroll during the COVID-19 pandemic. The ERTC was subsequently amended by the Taxpayer Certainty and Disaster Tax Relief Act of 2020, the Consolidated Appropriation Act of 2021, and the American Rescue Plan Act of 2021, all of which amended and extended the ERTC availability and guidelines under the CARES Act. During the third quarter of 2022, the Company evaluated its eligibility for the ERTC and is eligible to claim a refundable tax credit against the employer share of Social Security taxes equal to fifty percent (50%) of the qualified wages paid to employees between March 27, 2020 and December 31, 2020 and seventy percent (70%) of the qualified wages paid to employees between January 1, 2021 and September 30, 2021. For fiscal year 2020, qualified wages are limited to $10,000 annually per employee for a maximum allowable ERTC per employee of $5,000 annually and qualified wages are limited to $10,000 per calendar quarter in 2021 for a maximum allowable ERTC per employee of $7,000 for each calendar quarter in 2021.

The Company qualified for the ERTC in the last three quarters of 2020 and all three quarters of 2021 and filed a claim for the credit in August 2022. During the third quarter of 2022, the Company recorded an aggregate benefit of approximately $2.1 million in Other income, net - Employee Retention Tax Credit in its Consolidated Statements of Operations to reflect the ERTC for all eligible quarters. During the fourth quarter of 2022, the Company received $0.6 million related to the ERTC. As of December 31, 2022, the Company's Consolidated Balance Sheets include an ERTC benefit of $1.8 million and associated commissions payable of $0.3 million recorded within prepaid expenses and other current assets and accrued expenses, respectively. Subsequent to December 31, 2022, the Company received an additional $0.8 million related to the ERTC.

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

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our principal executive officer and principal financial officer, carried out an evaluation of the effectiveness of our disclosure controls and procedures as of December 31, 2022. Pursuant to Rule13a−15(e) promulgated by the Commission pursuant to the Securities Exchange Act of 1934, as amended (the "Exchange Act"), "disclosure controls and procedures" means controls and other procedures that are designed to ensure that information required to be disclosed by us in the reports that we file with the Commission is recorded, processed, summarized and reported within the time periods specified in the Commission's rules and forms. "Disclosure controls and procedures" include, without limitation, controls and procedures designed to ensure that information that we are required to disclose in the reports we file with the Commission is accumulated and communicated to our principal executive officer and principal financial officer as appropriate to allow timely decisions regarding required disclosure.

Based on their evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of December 31, 2022.

Management Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rule 13a-15(f) and 15d-(f) under the Exchange Act. Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external purposes in accordance with U.S. generally accepted accounting principles. Our internal control over financial reporting include those policies and procedures that:

(i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets;

(ii) provide reasonable assurance that transactions are recorded as necessary to permit the preparation of our consolidated financial statements in accordance with U.S. generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and

(iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the consolidated financial statements.

Our management, including the undersigned principal executive officer and principal financial officer, assessed the effectiveness of our internal control over financial reporting as of December 31, 2022. In conducting its assessment, our management used the criteria issued by the Committee of Sponsoring Organizations of the Treadway Commission in *Internal Control-Integrated Framework in 2013*. Based on this assessment, our management concluded that, as of December 31, 2022, our internal control over financial reporting was effective in providing reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting, as defined in Rule 13a-15(f) promulgated under the Exchange Act, that occurred during the fourth fiscal quarter of 2022 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Disclosure Controls and Procedures

The effectiveness of our disclosure controls and procedures is subject to various inherent limitations, including cost limitations, judgments used in decision making, assumptions about the likelihood of future events, the soundness of our systems, the possibility of human error, and the risk of fraud. Moreover, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions and the risk that the degree of compliance with policies or procedures may deteriorate over time. Because of these limitations, there can be no assurance that any system of disclosure controls and procedures, no matter how well conceived, will be successful in preventing all errors or fraud or in making all material information known in a timely manner to the appropriate levels of management.

Inherent Limitations on Internal Control

Internal control over financial reporting cannot provide absolute assurance of achieving financial reporting objectives because of its inherent limitations, including the possibility of human error and circumvention by collusion or overriding of control. Accordingly, even an effective internal control system may not prevent or detect material misstatements on a timely basis. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that the controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate. Accordingly, our internal control over financial reporting is designed to provide reasonable assurance of achieving their objectives.

Item 9B. Other Information

Not Applicable.

Item 9C. Disclosures regarding Foreign Jurisdictions that Prevent Inspections

Not Applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Information required by this item will be contained in the Proxy Statement as follows:

- The information relating to our executive officers is to be included in the section entitled “Information about our Executive Officers,”
- The information relating to our directors and nominees for director is to be included in the section entitled “Election of Directors” and “Information Regarding the Board of Directors and Corporate Governance,”
- The information relating to our audit committee and audit committee financial expert is to be included in the section “Information Regarding the Board of Directors and Corporate Governance,” and
- If required, the information regarding compliance with Section 16(a) of the Exchange Act is to be included in the section entitled “Delinquent Section 16(a) Reports.”

Such information will be included in the Proxy Statement and is incorporated herein by reference.

We have adopted a written Code of Business Conduct and Ethics (Code of Conduct) that applies to all officers, directors and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. The Code of Conduct is available on our website at www.chromadex.com. If we make any substantive amendments to the Code of Conduct or grant any waiver from a provision of the Code of Conduct to any executive officer or director, we will promptly disclose the nature of the amendment or waiver on our website in lieu of filing such waiver or amendment in a Current Report on Form 8-K.

Item 11. Executive Compensation

Information required by this item will be contained in the Proxy Statement under the caption "Executive Officers and Management Compensation" and is incorporated herein by reference.

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

Information required by this item will be contained in the Proxy Statement under the caption "Security Ownership of Certain Beneficial Owners and Management" and is incorporated herein by reference.

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

Information required by this item will be contained in the Proxy Statement under the caption "Certain Relationships and Related Transactions" and "Information Regarding the Board of Directors and Corporate Governance" and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

Our independent registered public accounting firm is Marcum LLP, New York, NY, Audit Firm ID: 688.

The information required by this item is to be included in our Proxy Statement under the caption "Ratification of the Appointment of Independent Registered Public Accounting Firm" and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a)(1) Financial Statements

Reference is made to Item 8 of this Annual Report on Form 10-K.

(a)(2) Financial Statement Schedules

All schedules have been omitted because they are not required or because the required information is given in the Financial Statements or Notes thereto set forth under Part II, Item 8 of this Annual Report on Form 10-K.

(a)(3) List of Exhibits

INDEX TO EXHIBITS

Exhibit No.	Description	Incorporated by Reference				Filed or Furnished Herewith
		Form	File Number	Exhibit	Filing Date	
2.1	Agreement and Plan of Merger, dated as of May 21, 2008, among Cody, CDI Acquisition, Inc. and ChromaDex, Inc. as amended on June 10, 2008	8-K	333-140056	2.1	6/24/2008	
3.1	Amended and Restated Certificate of Incorporation of the Registrant	10-K	001-37752	3.1	3/15/2018	
3.2	Certificate of Amendment to the Certificate of Incorporation of the Registrant	8-K	000-53290	3.1	4/12/2016	
3.3	Amended and Restated Bylaws of the Registrant	10-K	001-37752	3.3	3/15/2022	
4.2	Investor's Rights Agreement, effective as of December 31, 2005, by and between The University of Mississippi Research Foundation and ChromaDex	8-K	333-140056	4.1	6/24/2008	
4.3	Tag-Along Agreement effective as of December 31, 2005, by and among the Registrant, Frank Louis Jaksch, Snr. & Maria Jaksch, Trustees of the Jaksch Family Trust, Margery Germain, Lauren Germain, Emily Germain, Lucie Germain, Frank Louis Jaksch, Jr., and the University of Mississippi Research Foundation	8-K	333-140056	4.2	6/24/2008	
4.5	Form of Stock Certificate representing shares of the Registrant's Common Stock effective as of December 10, 2018	10-K	001-37752	4.5	3/7/2019	
4.6	Description of Common Stock of the Registrant	10-K	001-37752	4.6	3/10/2020	
4.7	Registration Rights Agreement, dated as of May 9, 2019, by and among the Registrant and the parties thereto	8-K	001-37752	99.2	5/10/2019	
4.8	Registration Rights Agreement, dated as of August 15, 2019, by and among the Registrant and the parties thereto	8-K	001-37752	99.1	8/15/2019	
4.9	Registration Rights Agreement, dated as of April 27, 2020, by and among the Registrant and the parties thereto	8-K	001-37752	99.2	4/29/2020	
4.10	Registration Rights Agreement, dated as of February 20, 2021, by and among the Registrant and Everfund	8-K	001-37752	99.2	2/22/2021	
4.11	Registration Rights Agreement, dated as of September 30, 2022, by and among the Registrant and the parties thereto	8-K	001-37752	10.3	10/3/2022	

Exhibit No.	Description	Incorporated by Reference				Filed or Furnished Herewith
		Form	File Number	Exhibit	Filing Date	
10.1	Second Amended and Restated 2007 Equity Incentive Plan effective March 13, 2007, as amended May 20, 2010 (1)+	DEF 14A	000-53290	Appendix B	5/4/2010	
10.2	Form of Stock Option Agreement under the ChromaDex, Inc. Second Amended and Restated 2007 Equity Incentive Plan(1)+	8-K	333-140056	10.3	6/24/2008	
10.3	Form of Restricted Stock Purchase Agreement under the ChromaDex, Inc. 2007 Equity Incentive Plan(1)+	8-K	333-140056	10.4	6/24/2008	
10.4	Amended and Restated Employment Agreement dated April 19, 2010, by and between Frank L. Jaksch, Jr. and ChromaDex, Inc. (1)+	8-K	000-53290	10.1	4/22/2010	
10.5	Amendment, dated June 22, 2018, to the Amended and Restated Employment Agreement, by and between Frank L. Jaksch Jr. and ChromaDex, Inc. +	8-K	001-37752	10.2	6/28/2018	
10.6	Waiver of bonus compensation agreement dated February 13, 2023, by and between Frank L. Jaksch Jr. and ChromaDex, Inc. +					X
10.7	License Agreement, dated March 25, 2010 between the University of Mississippi and ChromaDex, Inc.*	10-Q	000-53290	10.1	5/18/2010	
10.8	First Amendment to License Agreement, made as of June 3, 2011 between the University of Mississippi and ChromaDex, Inc.*	10-Q	000-53290	10.1	8/11/2011	
10.9	Restated and Amended License Agreement, effective as of June 3, 2015 between the University of Mississippi and ChromaDex, Inc.*	10-Q	000-53290	10.2	8/13/2015	
11.0	First Amendment to the License Agreement, effective as of September 5, 2014 between the Regents of the University of California and ChromaDex, Inc.*	10-Q	000-53290	10.1	11/6/2014	
10.10	Second Amendment to the License Agreement, effective as of December 31, 2015, between the Regents of the University of California and ChromaDex, Inc.*	10-Q	001-37752	10.8	11/10/2026	
10.11	Exclusive License Agreement, dated July 13, 2012 between Dartmouth College and ChromaDex, Inc.	10-Q	001-37752	10.3	11/10/2016	
10.12	Exclusive License Agreement, effective as of May 16, 2014 between Dartmouth College and ChromaDex, Inc.*	10-Q	000-53290	10.1	8/12/2014	
10.13	First Amendment to Exclusive License Agreement, effective as of June 13, 2016, between Dartmouth College and ChromaDex, Inc.*	10-Q	001-37752	10.10	11/10/2016	
10.14	License Agreement, effective as of October 15, 2014 between University of Mississippi and ChromaDex, Inc.*	10-K	000-53290	10.40	3/19/2015	
10.15	First Amendment to Exclusive License Agreement, effective as of July 6, 2015, between University of Mississippi and ChromaDex, Inc.	10-Q	001-37752	10.7	11/10/2016	
10.16	Lease Agreement, made as of April 14, 2016, by and between Longmont Diagonal Investments LLC and ChromaDex Analytics, Inc.	8-K	000-53290	10.1	4/20/2016	

Exhibit No.	Description	Incorporated by Reference				Filed or Furnished Herewith
		Form	File Number	Exhibit	Filing Date	
10.17	First Amendment to Lease Agreement, dated August 3, 2020, by and between ChromaDex Analytics, Inc. and 62 1625-1751 S. Fordham LLC and 64 1625-1751 S. Fordham LLC (62 1625-1751 S. Fordham LLC and 64-1625-1751 S. Fordham LLC are successors-in-interest to Lease Agreement, made as of April 14, 2016, by and between ChromaDex Analytics, Inc and Longmont Diagonal Investments LLC)	10-Q	001-37752	10.8	11/4/2020	
10.18	Form of Indemnity Agreement, between the Registrant and each of its existing directors and executive officers +	8-K	001-37752	10.1	12/16/2016	
10.19	Amended and Restated Non-Employee Director Compensation Policy +	10-Q	001-37752	10.4	8/9/2018	
10.20	Membership Interest Purchase Agreement effective as of March 12, 2017, by and among Robert Fried, Charles Brenner, Jeffrey Allen and the Registrant	10-Q	001-37752	10.1	5/11/2017	
10.21	Form of Restricted Stock Award Agreement for Robert Fried +	10-Q	001-37752	10.3	5/11/2017	
10.22	Amended and Restated Executive Employment Agreement, dated June 22, 2018, by and between Robert Fried and the Registrant +	8-K	001-37752	10.1	6/28/2018	
10.23	ChromaDex Corporation 2017 Equity Incentive Plan, as amended, and Form of Option Grant Notice, Form of Option Agreement, Form of Restricted Stock Award Grant Notice, Form of Restricted Stock Award Agreement, Form of Restricted Stock Unit Award Grant Notice and Form of Restricted Stock Unit Award Agreement thereunder +	8-K	001-37752	99.1	6/22/2020	
10.24	Lease, dated July 6, 2017, by and between 10900 WILSHIRE L.L.C and ChromaDex, Inc.	10-K	001-37752	10.50	3/7/2019	
10.25	First Amendment to Lease, dated February 7, 2018, by and between 10900 WILSHIRE L.L.C and ChromaDex, Inc.	10-K	001-37752	10.51	3/7/2019	
10.26	Second Amendment to Lease, dated June 30, 2018, by and between 10900 WILSHIRE L.L.C and ChromaDex, Inc.	10-K	001-37752	10.52	3/7/2019	
10.27	Third Amendment to Lease, dated November 9, 2018, by and between 10900 WILSHIRE L.L.C and ChromaDex, Inc.	10-K	001-37752	10.53	3/7/2019	
10.28	Fifth Amendment to Lease, dated May 21, 2021, by and between 10900 WILSHIRE L.L.C and ChromaDex, Inc.	10-Q	001-37752	10.1	8/3/2021	
10.29	Fifth Amendment to Lease, dated May 21, 2021, by and between 10900 WILSHIRE L.L.C and ChromaDex, Inc.	10-Q	001-37752	10.1	8/3/2021	
10.30	Executive Employment Agreement, dated October 5, 2017, by and between Kevin M. Farr and the Registrant +	8-K	001-37752	10.1	10/10/2017	
10.31	Securities Purchase Agreement dated April 26, 2017, by and among the Company and the Purchasers	8-K	001-37752	99.1	4/27/2017	
10.32	Supply Agreement, dated December 19, 2018, by and between ChromaDex, Inc. and Nestec Ltd. *	10-K	001-37752	10.34	3/14/2022	
10.33	Note Purchase Agreement, dated May 9, 2019, by and among ChromaDex Corporation and Winsave Resource Limited and Pioneer Step Holdings Limited	8-K	001-37752	99.1	5/10/2019	

Exhibit No.	Description	Incorporated by Reference				Filed or Furnished Herewith
		Form	File Number	Exhibit	Filing Date	
10.34	Omnibus Amendment to Note Purchase Agreement and Convertible Promissory Notes, dated June 30, 2019, by and among ChromaDex Corporation and Winsave Resource Limited and Pioneer Step Holdings Limited	8-K	001-37752	99.1	7/1/2019	
10.35	Securities Purchase Agreement, dated August 13, 2019, by and among ChromaDex Corporation and the purchasers therein	8-K	001-37752	99.1	8/14/2019	
10.36	Securities Purchase Agreement, dated April 27, 2020, by and among ChromaDex Corporation and Winsave Resources Limited and Pioneer Step Holdings Limited	8-K	001-37752	99.1	4/29/2020	
10.37	At Market Issuance Sales Agreement, dated as of June 12, 2020, by and among ChromaDex Corporation, B. Riley FBR, Inc. and Raymond James & Associates, Inc.	S-3	333-237144	1.2	6/12/2020	
10.38	Business Financing Agreement, dated November 12, 2019, by and between ChromaDex Corporation and Western Alliance Bank	10-K	001-37752	10.45	3/10/2020	
10.39	First Modification to Business Financing Agreement dated October 7, 2020, by and between ChromaDex Corporation and Western Alliance Bank	10-K	001-37752	10.43	3/12/2021	
10.40	Second Modification to Business Financing Agreement dated November 10, 2021, by and between ChromaDex Corporation and Western Alliance Bank	10-K	001-37752	10.42	3/14/2022	
10.41	Third Modification to Business Financing Agreement dated December 11, 2021 by and among Western Alliance Bank, ChromaDex Corporation, ChromaDex, Inc. and ChromaDex Analytics, Inc.	8-K	001-37752	10.1	12/14/2021	
10.42	Manufacturing and Supply Agreement, dated as of January 1, 2016, by and between ChromaDex, Inc. and W.R. Grace & Co.-Conn. **	10-Q	001-37752	10.1	11/4/2020	
10.43	Amendment to Manufacturing and Supply Agreement, dated as of February 27, 2017, by and between ChromaDex, Inc. and W.R. Grace & Co.-Conn. **	10-Q	001-37752	10.2	11/4/2020	
10.44	Second Amendment to Manufacturing and Supply Agreement, dated as of January 1, 2018, by and between ChromaDex, Inc. and W.R. Grace & Co.-Conn. **	10-Q	001-37752	10.3	11/4/2020	
10.45	Third Amendment to Manufacturing and Supply Agreement, dated as of January 1, 2019, by and between ChromaDex, Inc. and W.R. Grace & Co.-Conn. **	10-Q	001-37752	10.4	11/4/2020	
10.46	Fourth Amendment to Manufacturing and Supply Agreement, dated as of April 15, 2019, by and between ChromaDex Inc. and W.R. Grace & Co.-Conn. **	10-Q	001-37752	10.5	11/4/2020	
10.47	Fifth Amendment to Manufacturing and Supply Agreement, dated as of January 1, 2020, by and between ChromaDex Inc. and W.R. Grace & Co.-Conn. **	10-Q	001-37752	10.6	11/4/2020	
10.48	Sixth Amendment to Manufacturing and Supply Agreement, dated as of September 17, 2020, by and between ChromaDex Inc. and W.R. Grace & Co.-Conn. **	10-Q	001-37752	10.7	11/4/2020	

Exhibit No.	Description	Incorporated by Reference				Filed or Furnished Herewith
		Form	File Number	Exhibit	Filing Date	
10.49	Seventh Amendment to Manufacturing and Supply Agreement, dated as of August 2, 2021, by and between ChromaDex Inc. and W.R. Grace & Co.-Conn. **	10-Q	001-37752	10.3	8/3/2021	
10.50	Eighth Amendment to Manufacturing and Supply Agreement, dated as of December 14, 2022, by and between ChromaDex Inc. and W.R. Grace & Co.-Conn.**					X
10.51	Securities Purchase Agreement, dated February 20, 2021, by and between the Company and Everfund	8-K	001-37752	99.1	2/22/2021	
10.52	Consent to Business Financing Agreement, dated January 14, 2021, by and among Western Alliance Bank and ChromaDex Corporation	10-Q	001-37752	10.4	5/6/2021	
10.53	Exclusive License Agreement, dated September 8, 2011, by and between ChromaDex, Inc. and The Regents of the University of California **	10-Q	001-37752	10.1	11/3/2021	
10.54	Lease, dated November 24, 2021, by and between Flight Phase I Owner, LLC and ChromaDex, Inc.	10-K	001-37752	10.59	3/14/2022	
10.55	First Amendment to the Amended and Restated Exclusive License Agreement, effective as of December 29, 2020, between Dartmouth College and ChromaDex, Inc.	10-Q	001-37752	10.2	5/12/2022	
10.56	Second Amendment to the Amended and Restated Exclusive License Agreement, effective as of January 1, 2022, between Dartmouth College and ChromaDex, Inc.	10-Q	001-37752	10.1	5/12/2022	
10.57	Side letter agreement to the Amended and Restated Exclusive License Agreement, effective as of March 13, 2019, between Dartmouth College and ChromaDex, Inc.	10-Q	001-37752	10.3	5/12/2022	
10.58	Restated and Amended Exclusive License Agreement, effective as of March 13, 2017, between Dartmouth College and ChromaDex, Inc.	10-Q	001-37752	10.4	5/12/2022	
10.59	First Amendment to the Joint Ownership Management Agreement, effective March 9, 2022, between Queen's University of Belfast and ChromaDex, Inc.	10-Q	001-37752	10.5	5/12/2022	
10.60	Joint Ownership Management Agreement, effective October 9, 2015, between Queen's University of Belfast and ChromaDex, Inc.	10-Q	001-37752	10.6	5/12/2022	
10.61	Shareholders Agreement, effective as of September 30, 2022, between Hong Kong Taikuk (China) Group Ltd. and the Company's named subsidiaries	8-K	001-37752	10.1	10/3/2022	
10.62	Securities Purchase Agreement, dated September 30, 2022, by and among the Company and the Purchasers	8-K	001-37752	10.2	10/3/2022	
10.63	Executive Employment Agreement, dated January 1, 2023, by and between Brianna Gerber and the Registrant +	8-K	001-37752	10.1	1/5/2023	
10.64	Securities Purchase Agreement, dated as of October 10, 2022, by and between the Company and the Purchaser *	8-K	001-37752	10.1	10/11/2022	
10.65	Amended and Restated Supply Agreement, dated October 10, 2022, by and between the Company, Nestec Ltd. and NHSc **	10-Q	001-37752	10.6	11/2/2022	

Exhibit No.	Description	Incorporated by Reference				Filed or Furnished Herewith
		Form	File Number	Exhibit	Filing Date	
10.66	Separation Letter Agreement, dated August 10, 2022, by and between the Company and Kevin Farr +	8-K	001-37752	10.1	8/10/2022	
10.67	Consultant Agreement, dated August 10, 2022, by and between the Company and Kevin Farr +	8-K	001-37752	10.2	8/10/2022	
21.1	Subsidiaries of ChromaDex Corporation					X
23.1	Consent of Marcum, LLP, Independent Registered Public Accounting Firm					X
24.1	Power of Attorney (included on the signature page of this Annual Report on Form 10-K)					X
31.1	Certification of the Chief Executive Officer pursuant to §240.13a-14 or §240.15d-14 of the Securities Exchange Act of 1934, as amended					X
31.2	Certification of the Chief Financial Officer pursuant to §240.13a-14 or §240.15d-14 of the Securities Exchange Act of 1934, as amended					X
32.1	Certification pursuant to 18 U.S.C. Section 1350 (as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002)					X
101.INS	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.					
101.SCH	Inline XBRL Taxonomy Extension Schema Document					
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document					
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document					
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document					
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document					
104	Cover Page Interactive Data File - formatted in Inline XBRL and included in Exhibit 101					

(1) Plan and related Forms were assumed by ChromaDex Corporation pursuant to Agreement and Plan of Merger, dated as of May 21, 2008, among ChromaDex Corporation (formerly Cody Resources, Inc.), CDI Acquisition, Inc. and ChromaDex, Inc.

(2) Schedules have been omitted pursuant to Item 601(b)(2) of Regulation S-K. ChromaDex Corporation undertakes to furnish supplemental copies of any of the omitted schedules upon request by the Securities and Exchange Commission; provided, however, that ChromaDex Corporation may request confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended, for any schedule so furnished.

\+ Indicates management contract or compensatory plan or arrangement.

* This Exhibit has been granted confidential treatment and has been filed separately with the Commission. The confidential portions of this Exhibit have been omitted and are marked by an asterisk.

** Certain portions of this exhibit are omitted because they are both not material and are the type that the Registrant treats as private or confidential.

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.

CHROMADEX CORPORATION

By: /s/ ROBERT FRIED
Robert Fried
Chief Executive Officer

Date: March 8, 2023

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Robert Fried and Brianna Gerber, and 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 to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or either of them, or their or his substitutes or substitute, 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 in the capacities and on the dates indicated.

Signature	Title	Date
/s/ ROBERT FRIED Robert Fried	Chief Executive Officer and Director *(Principal Executive Officer)*	March 8, 2023
/s/ BRIANNA GERBER Brianna Gerber	Chief Financial Officer *(Principal Financial and Accounting Officer)*	March 8, 2023
/s/ FRANK JAKSCH JR. Frank Jaksch Jr.	Chairman of the Board and Director	March 8, 2023
/s/ STEVEN RUBIN Steven Rubin	Director	March 8, 2023
/s/ WENDY YU Wendy Yu	Director	March 8, 2023
/s/ GARY NG Gary Ng	Director	March 8, 2023
/s/ ANN COHEN Ann Cohen	Director	March 8, 2023
/s/ KRISTIN PATRICK Kristin Patrick	Director	March 8, 2023
/s/ HAMED SHAHBAZI Hamed Shahbazi	Director	March 8, 2023