Risk Factors Comparison 2024-02-29 to 2023-03-13 Form: 10-K

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An investment in our securities involves a high degree of risk. You should carefully consider the following risk factors, together with all of the other information included in this Annual Report, before making an investment decision. Our business, prospects, financial condition or operating results could decline due to any of these risks and, as a result, you may lose all or part of your investment. Unless the context otherwise requires, all references in this section to the " Company, " " we, " " us " or " our " refer to the business of Ginkgo and its subsidiaries. Risks Related to Ginkgo' s Business We have a history of net losses. We expect to continue to incur losses for the foreseeable future, and we may never achieve or maintain profitability. We have incurred significant operating losses since our inception. Our net loss attributable to our stockholders was approximately $ **892** ~~2, 104~~. 9 million, $ **2.** 1 ~~, 830. 0 million~~ **billion** and $ ~~126~~ **1** . ~~6~~ **8** ~~million~~ **billion** for the fiscal years ended December 31, **2023,** 2022 ~~,~~ **and** 2021 ~~and 2020~~, respectively. As of December 31, ~~2022~~ **2023** , we had an accumulated deficit of approximately $ **5** ~~4, 397~~. ~~7~~ **3** ~~million~~ **billion** . We may incur losses and negative cash flow from operating activities for the foreseeable future as we continue to invest significant additional funds toward further developing our platform, the cell programs we perform on behalf of our customers and otherwise growing our business, including our ~~biosecurity~~ **Biosecurity** ~~and public health~~ unit ~~, Concentric by Ginkgo~~. Our operating expenses have increased as a result of becoming a public company, and we expect that our operating expenses will ~~continue to increase~~ **either remain consistent or decline in 2024** as ~~we grow~~ **compared to 2023, reflecting a stabilization in** our ~~business~~ **operational overhead** . We have derived a significant portion of our revenues from fees and milestone payments from technical development services provided to customers to advance programs, as well as a significant portion of our revenues from **Biosecurity** ~~Concentric by Ginkgo~~. Historically, these fees have not been sufficient to cover the full cost of our operations. Additionally, if our customers terminate their agreements or development plans with us, our near- term revenues could be adversely affected. In addition, certain of our customer agreements provide for milestone payments, future royalties and other forms of contingent consideration, the payment of which are uncertain, as they are dependent on our ability to successfully develop engineered cells, bioprocesses, or other deliverables and our customers' ability and willingness to successfully develop and commercialize products and processes. Our expenses may exceed revenues ~~for~~ **in** the foreseeable future and we may not achieve profitability. If we fail to achieve profitability, or if the time required to achieve profitability is longer than we anticipate, we may not be able to expand or continue our business, and the value of our common stock could be negatively impacted. Our ability to achieve or sustain profitability is based on numerous factors, many of which are beyond our control, including the development of our platform, the initiation of new programs with new and existing customers, the commercial terms of our programs, the realization of any potential downstream value from our programs, our ability to advance cell engineering programs in a timely and cost- effective manner, our ability to extend new offerings to customers, our customers' ability to scale up bioprocesses, the ability of our customers to produce and sell products, the impact of market acceptance of our customers' products, and our customers' market penetration and margins. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. We may need substantial additional capital in the future in order to fund our business. We have consumed considerable amounts of capital to date, and we expect to incur continued net losses over the next several years as we continue to develop our business, advance our programs, expand and enhance our platform, and make the capital investments necessary to scale up our Foundry operations and Codebase assets. We have used, and may continue to use, additional capital for **Biosecurity** ~~Concentric by Ginkgo~~, strategic investments and acquisitions. We believe that our cash and cash equivalents, short- term investments, and interest earned on investments will be sufficient to meet our projected operating requirements for several years and until we reach profitability. However, these assumptions may prove to be incorrect and we could exhaust our available capital resources sooner than we currently expect. Because of the numerous risks and uncertainties associated with our programs, including risks and uncertainties that could impact the rate of progress of our programs, we are unable to estimate with certainty the amounts of capital outlays and operating expenditures associated with these activities. We do not currently have any commitments for future funding. We may receive fees, milestones, and royalty payments under our customer agreements, but these are not guaranteed, and we may receive non- cash consideration which involves estimations of fair market value. The initial fair market value of the non- cash consideration may decrease after contract inception and the amount of cash proceeds eventually realized may be less than the revenue recognized. Additionally, we may sell our equity interests in certain subsidiaries or collaborations but most of these equity stakes are in private companies and we may not be able to find a buyer **due to contractual restrictions or otherwise,** or may incur significant impairment if we sell these positions for liquidity. We may not receive any further funds under those agreements, the funds we receive may be lower than projected and / or disclosed as potential downstream value, or our program costs may be higher than projected. In addition, we may not be able to sign new customer agreements or enter into new development plans with existing customers with adequate funds to cover program development expenses. As a result of these and other factors, we do not know whether additional financing will be available when needed, or, if available, whether such financing would be on terms favorable to our stockholders or us. If future financings involve the issuance of equity securities, our existing stockholders would suffer dilution. If we raise debt financing in the future, we may be subject to restrictive covenants that limit our ability to conduct our business. Our ability to raise funds may be adversely impacted by current or future economic conditions. If we fail to raise sufficient funds and continue to incur losses, our ability to fund our operations, take advantage of strategic opportunities, or otherwise respond to competitive pressures could be significantly limited. If adequate funds are not available, we may not be able to successfully execute our business plan or continue our business. We

have experienced rapid growth and expect our growth to continue, and if we fail to effectively manage our growth, then our business, results of operations, and financial condition could be adversely affected. We have experienced substantial growth in our business since inception, including as a result of our recent acquisitions, which has placed and may continue to place significant demands on our company culture, operational infrastructure, and management. We believe that our culture has been a critical component of our success. We have invested substantial time and resources in building our team and nurturing a culture of empowerment of, and active engagement by, our employees. As we expand our business, integrate employees and technology from our recent acquisitions, and mature as a public company, we may find it difficult to maintain our culture while managing this growth. Any failure to manage our anticipated growth and organizational changes in a manner that preserves the key aspects of our culture could be detrimental to future success, including our ability to recruit and retain personnel, and effectively focus on and pursue our objectives. This, in turn, could adversely affect our business, results of operations, and financial condition. In addition, in order to successfully manage our rapid growth, our organizational structure has become more complex and is likely to continue to become more complex. In order to manage these increasing complexities, we will need to continue to scale and adapt our operational, financial, and management controls, as well as our reporting systems and procedures. The expansion of our systems and infrastructure will require us to commit substantial financial, operational, and management resources before our revenue increases and without any assurances that our revenue will increase. Finally, continued growth could strain our ability to maintain reliable service levels and offerings for our customers. If we fail to achieve the necessary level of capacity, quality and efficiency in performing services and other development activities, or the necessary level of efficiency in our organizational structure as we grow, then our business, results of operations, and financial condition could be adversely affected. Our limited operating history makes it difficult to evaluate our current business and future prospects. We have a portfolio of cell engineering programs which vary in start date, duration, complexity, and revenue potential. Additionally, our downstream economics in the form of equity interests, milestone payments, or royalty streams add an additional level of uncertainty to our possible future performance. Consequently, predictions about our future success or viability are highly uncertain and may not be as accurate as they could be if we had a longer company history of successfully developing, commercializing and generating revenue from our programs and / or downstream economic participation. With respect to **Biosecurity** ~~Concentric by Ginkgo~~ , ~~prior to 2020, we had no~~ **now** ~~experience developing~~ **that the White House and World Health Organization have each announced the end of the public health emergency effective May 2023, the revenue stream of** ~~or~~ **our** ~~commercializing testing services. Moreover, as described above, given the limited operating history of this offering, our reliance on government funding for testing, potential disruptions from vaccine rollout generally, the availability of~~ COVID- 19 ~~therapeutics, the impact of summer vacation and other~~ school ~~breaks, and the increased availability of over- the- counter testing options, the future performance of our COVID- 19 testing program is unpredictable. Moreover, the White House announced that the public health emergency will end in May 2023, therefore, we cannot predict the duration of the revenue stream, which will likely diminish significantly, from our COVID- 19~~ testing services **ended in the third quarter of 2023** . Our long- term objective is to generate free cash flow from the commercialization of programs by customers across a variety of industries, as well as from our biosecurity- focused offerings. Our estimated costs and timelines for the completion of programs are based on our experiences to date and our expectations for each stage of the program in development. Given the variety of types of programs we support and the continued growth of our platform, there is variability in timelines and costs for launching and executing programs, and completion dates can change over the course of a customer engagement. Our costs and timelines may be greater or subject to variability where regulatory requirements lead to longer timelines, such as in agriculture, food, and therapeutics. In addition, we have equity interests in certain companies and there is and will continue to be variability in the financial performance of these other companies or future companies in which we may have equity interests. As a business with a limited operating history, we may encounter unforeseen expenses, difficulties, complications, delays, and other known and unknown obstacles. We have encountered in the past, and will encounter in the future, risks and uncertainties frequently experienced by growing companies with limited operating histories in emerging and rapidly changing industries. If our assumptions regarding these risks and uncertainties, which we use to plan and operate our business, are incorrect or change, or if we do not address these risks successfully, our results of operations could differ materially from our expectations, and our business, financial condition, and results of operations could be adversely affected. **Uncertainty regarding the demand for biosecurity services could materially adversely affect our business. Our Biosecurity offering consists of pathogen testing, sequencing, and insights delivery which are subject to inherent risks of commercial viability, such as demand for services and price or market share erosion due to competition. For example, the White House and World Health Organization have each announced the end of the public health emergency effective May 2023; therefore, the revenue stream of our COVID- 19 school testing services ended in the third quarter of 2023. As a result, our Biosecurity business is now focusing on global surveillance programs and analytic services. However, creating the commercial and technical infrastructure to provide biosecurity services globally is expensive.** We **may also be limited in our ability to scale up based on expense or unavailability of the required materials, equipment, personnel and infrastructure necessary to deliver biosecurity on a large, international scale. We may not be able to recover our investment expenses with sufficient revenue generated by our biosecurity efforts. Our ability to commercialize our biosecurity programs is also subject to available government, private, and multilateral funding. If governments decide that the biosecurity offerings are not necessary or that they do not have the funds to support them, we may experience difficulty in expanding and growing the biosecurity business. We are or** could become involved in securities or shareholder litigation and other related matters, which could be expensive and time- consuming. Such litigation and related matters could harm our business. We **have been and** may **in the future** be a target for securities and shareholder lawsuits ~~in the future, including lawsuits filed in connection with the Zymergen Acquisition. In addition, shareholder litigation is pending against Zymergen and certain of its former officers and directors in connection with Zymergen' s April 2021 initial public offering~~ . The outcome of such pending and potential litigation is uncertain. Such

disputes, including any related governmental or regulatory investigations **and the cost of defending such** , could result in an adverse effect on our business, results of operations, financial condition, reputation and cash flows, and could adversely impact the market price of our common stock. Although the results of lawsuits and claims cannot be predicted with certainty, defending against such claims could be costly and could impose a significant burden on management and employees. Any litigation to which we become a party may result in an onerous or unfavorable judgment, or may be resolved with a monetary payment. If we cannot maintain and expand current customer partnerships and enter into new customer partnerships, our **cell engineering** business could be adversely affected. We do not generate substantial revenue from our own products, and instead generate revenue from customer collaborations in which we provide **cell engineering** services, and also typically receive downstream value in the form of royalties, equity, or milestone payments. As a result, our success depends on our ability to expand the number, size and scope of our customer collaborations. Our ability to win new business depends on many factors, including our reputation in the market, the quality of our service offerings relative to alternatives, the pricing and efficiency of our services relative to alternatives, our technical and operational capabilities, our sales team effectiveness, and the customer' s ability to fund new work. If we fail to maintain a position of strength in any of these factors, our ability to deliver on customer programs, sign new customer collaborations, and / or launch new programs with existing customers may suffer and this could adversely affect our prospects. Additionally, in the process of developing programs, we generate Foundry know- how and accumulate meaningful biological and data assets, including optimized proteins and organisms, characterized genetic parts, enhanced understanding of metabolic pathways, biological, chemical, and genetic libraries, and other elements of biological data. Data and know- how generated from our programs provide the basis for expanded capabilities that we believe further supports our customer collaborations. As a result, in addition to reducing our revenue or delaying the development of our programs, the loss of one or more of our customer relationships or the failure to add new customers or programs may hinder our accumulation of such information, thus hindering our efforts to advance our technological differentiation and improve our platform. We engage in conversations with companies regarding potential customer collaborations on an ongoing basis. We may spend considerable time and money engaging in these conversations and feasibility assessments, including understanding the technical approach to a program, customer concerns and limitations, and legal or regulatory landscape of a potential program or offering, which may not result in a commercial agreement. Even if an agreement is reached, the resulting relationship ~~may~~ **is** not **always successful, which may** be ~~successful~~ for many reasons, including our inability to complete a program to our customers' specifications or within our customers' time frames, or unsuccessful development or commercialization of products or processes by our customers. In such circumstances, our revenues and downstream value potential from such a collaboration **has been and** might **in the future** be meaningfully reduced. We currently own and may in the future own equity interests in other operating companies, including with respect to certain of our customers and we may receive non- cash consideration which involves estimations of fair market value. The initial fair market value of the non- cash consideration may decrease after contract inception and the amount of cash proceeds eventually realized may be less than the revenue recognized. Consequently, we have exposure to the volatility and liquidity risks inherent in holding their equity and overall operational and financial performance of these businesses. We currently own equity interests in several of our customers, and we may receive non- cash consideration for our services, which involves estimations of fair market value. The initial fair market value of the non- cash consideration may decrease after contract inception and the amount of cash proceeds eventually realized may be less than the revenue recognized. In the future, we may also own equity interests in other companies. The process by which we receive equity interests and the factors we consider in deciding whether to accept, hold or dispose of these equity positions may differ significantly from those that an independent investor would evaluate when considering equity interests in a company. Owning equity increases our exposure to the risks of the other company and, in the case of customers, beyond the products of our collaborations. Our equity ownership positions expose us to market volatility and the potential for negative returns. We may have restrictions on resale or limited markets to sell our equity ownership. In many cases, our equity position is a minority position which exposes us to further risk, as we are not able to exert control over the companies in which we hold securities. In connection with future collaborations or joint ventures, we may, from time to time, receive warrants or options, all of which involve special risks. To the extent we receive warrants or options in connection with future collaborations or joint ventures, we would be exposed to risks involving pricing differences between the market value of underlying securities and our exercise price for the warrants or options, a possible lack of liquidity, and the related inability to close a warrant or option position, all of which could ultimately have an adverse effect on our financial position. We leverage our own resources and partner with strategic and financial investors in order to help early stage companies and innovators secure funding and benefit from our platform, which exposes us to a number of risks. Since our founding, we have helped to launch new companies (such as BiomEdit, LLC **(" BiomEdit ")** , Motif FoodWorks, Inc. **(" Motif ")** , Allonnia LLC **(" Allonnia ")** , Arcaea, LLC **(" Arcaea ")** , Ayana Bio, LLC **(" Ayana ")** and Verb Biotics, LLC **(" Verb ")**) by bringing together strategic and financial investors to secure funding for these early stage and small companies. Going forward, we intend to continue to leverage our own balance sheet and partner with investors to enable companies at all stages to benefit from our platform. Partnering with and investing in early stage and small companies may expose us to a number of risks, including that early stage and small companies may have: ● shorter operating histories, narrower product lines and smaller market shares than larger businesses, which tend to render small companies more vulnerable to competitors' actions and market conditions, as well as general economic downturns; ● more limited access to capital and higher funding costs, may be in a weaker financial position and may need more capital than originally anticipated to expand, compete and operate their business; ● the inability to obtain financing from the public capital markets or other traditional sources, such as commercial banks, in part because loans made to these types of companies entail higher risks than loans made to companies that have larger businesses, greater financial resources or are otherwise able to access traditional credit sources on more attractive terms; ● a higher likelihood of holding cash deposits or maintaining lines of credit with banks focused on providing banking services to early stage or venture- backed companies, such as Silicon Valley Bank **(" SVB ")** , which ~~recently~~

failed **in March 2023** ; ● a higher likelihood of depending on the management talents and efforts of a small group of persons; therefore, the death, disability, resignation or termination of one or more of these persons could have a material adverse impact on such company and, in turn, on us; ● less predictable operating results, may be engaged in rapidly changing businesses with products subject to a substantial risk of obsolescence, and may require substantial additional capital to support their operations, finance expansion or maintain their competitive position; ● particular vulnerabilities to changes in customer preferences and market conditions, depend on a limited number of customers, and face intense competition, including from companies with greater financial, technical, managerial and marketing resources; and ● fewer administrative resources, which can lead to greater uncertainty in their ability to generate accurate and reliable financial data, including their ability to deliver audited financial statements. Any of these factors or changes thereto could impair an early stage or small company' s financial condition, results of operation, cash flow or result in other adverse events, such as bankruptcy. This, in turn, could result in losses in our investments and a change in our income (loss) on investments. We may be unable to complete future strategic acquisitions or successfully integrate strategic acquisitions which could adversely affect our business and financial condition. Our inability to complete any future strategic acquisitions or to successfully integrate any new or previous strategic acquisitions could have a material adverse effect on our business. Our business strategy includes the acquisition of technologies and businesses that complement or augment our existing products and services. We may continue to seek attractive opportunities to acquire **technologies or** businesses, enter into joint ventures and make other investments that are complementary to our existing strengths. There are no assurances, however, that any strategic acquisition opportunities will arise or, if they do, that they will be consummated. Certain acquisitions may be difficult to complete for a number of reasons, including the need to satisfy customary closing conditions, the need for antitrust and / or other regulatory approvals, as well as disputes or litigation. In addition, any strategic acquisition we may complete may be made at a substantial premium over the fair value of the net identifiable assets ~~of~~ **in** the **acquisition** ~~acquired company~~ and thus our realization of this value relies on successful integration and continued operations. We may not be able to integrate acquired **technologies, assets, products, operations or** businesses successfully ~~into our existing businesses~~ , make ~~such~~ **any acquired** businesses profitable, retain key employees **(or integrate employees)** or realize anticipated **revenues,** cost savings **,** or synergies, if any, from these acquisitions **, or do so in an effective, timely and non- disruptive manner** , which could adversely affect our business and financial condition. Further, our ongoing business may be disrupted, and our management' s attention may be diverted by acquisitions, investments, transition and / or integration activities. ~~See " Risk Factors — Risks Related to the Zymergen Acquisition. "~~ We have in the past, and in the future may continue to pursue strategic acquisitions and investments that are dilutive to our stockholders, and such strategic acquisitions or investments could have an adverse impact on our business if they are unsuccessful. We have made acquisitions in the past and, as appropriate opportunities become available, we may acquire additional businesses, assets, technologies, or products to enhance our business in the future, but our ability to do so successfully cannot be ensured. We have also made investments in companies that we view as synergistic with our business. Although we conduct due diligence on these acquisitions and investments, such processes may underestimate or fail to reveal significant liabilities and we could incur losses resulting from liabilities of the acquired business that are not covered by indemnification we may obtain from the seller. Even if we identify suitable opportunities, including pending transactions, we may not be able to complete such acquisitions on favorable terms or at all, which could damage our business. Additionally, pursuing acquisitions, whether successful or unsuccessful, could result in civil litigation and regulatory penalties. Any acquisitions we make may not strengthen our competitive position, and these transactions may be viewed negatively by customers or investors. We may decide to incur debt or spend cash in connection with a strategic acquisition, which may cause us to face liquidity concerns or be subject to restrictive covenants in the future. We have issued, and in the future may issue, common stock or other equity securities to the stockholders of the acquired company, which **, if such issuances were unregistered, we may be contractually required to register on Form S- 3 and may be subject to piggyback registration rights. Such issuances** could constitute a material portion of our then- outstanding shares of common stock and may reduce the percentage ownership of our existing stockholders. ~~In addition, we may not be able to successfully integrate the acquired personnel, assets, technologies, products and / or operations into our existing business in an effective, timely, and non- disruptive manner or retain acquired personnel following an acquisition.~~ Acquisitions may also ~~divert management' s attention from day- to- day responsibilities,~~ increase our expenses and reduce our cash available for operations and other uses. In addition, we may not be able to fully recover the costs of such acquisitions or be successful in leveraging any such strategic transactions into increased business, revenue, or profitability. We also cannot predict the number, timing, or size of any future acquisitions or the effect that any such transactions might have on our operating results. Accordingly, although there can be no assurance that we will undertake or successfully complete any future acquisitions, any transactions that we have completed or in the future do complete may not yield the anticipated benefits and may be subject to the foregoing or other risks and have a material and adverse effect on our business, financial condition, results of operations, and prospects. Conversely, any failure to pursue or delay in completing any acquisition or other strategic transaction that would be beneficial to us, including those caused by competing parties, could **impact our ability to sign new programs,** delay the development of our platform **,** or **slow the** advancement of our programs and, thus, potential commercialization of our customer' s products. Our programs may not achieve milestones ~~and~~ **, earn royalties or complete** other anticipated key events on the expected timelines or at all, which could have an adverse impact on our business and could cause the price of our common stock to decline. We may adopt various technical, manufacturing, regulatory, commercial, and other objectives for our programs. These milestones may include our or our customers' expectations regarding the commencement or completion of technical development, the achievement of manufacturing targets, the submission of regulatory filings, or the realization of other development, regulatory, or commercialization objectives by us or our customers. The achievement of many of these milestones may be outside of our control. All of these milestones are based on a variety of assumptions, including assumptions regarding capital resources, constraints, and priorities, progress of and results from research and development (" R & D ") activities, and

other factors, ~~including impacts resulting from the COVID- 19 pandemic,~~ any of which may cause the timing of achievement of the milestones to vary considerably. If we, our collaborators, or our customers fail to achieve milestones in the expected timeframes, the commercialization of our programs may be delayed, our credibility may be undermined, our expectations with respect to potential future downstream value may be inaccurate **, our ability to earn royalties may be impacted** , our business and results of operations may be harmed, and the trading price of our common stock may decline. We must continue to secure and maintain sufficient and stable supplies of laboratory reagents, consumables, equipment, and laboratory services. We depend on a limited number of suppliers, some of which are single- source suppliers, and contract manufacturers for critical supplies, equipment, and services for research, development, and manufacturing of our products and processes. Our reliance on these third parties exposes us to risks relating to costs, contractual terms, supply, and logistics, and the loss of any one or more of these suppliers or contract manufacturers or their failure to supply us with the necessary supplies, equipment, or services on a timely basis, could cause delays in our research, development, or production capacity and adversely affect our business. ~~The COVID- 19 pandemic has caused substantial disruption in global supply chains and the ability of third parties to provide us services on a timely basis or at all. The Ukraine War is further disrupting global supply chains. Additionally, widespread~~ **Widespread** inflationary pressures exist across global economies, resulting in disruptions or higher costs for disposable lab equipment, raw materials and synthetic biology materials and services, and significant increases in the future could adversely affect our results of operations. We have experienced shortages in some of our key equipment and supplies, including those required in our labs, as well as disruptions in services provided by third parties, and may ~~continue to~~ do so in the future as a result of ~~the~~ **supply chain issues tied to global** ~~pandemic~~ **pandemics , conflicts** , or otherwise. We may also experience price increases, quality issues and longer lead times due to unexpected material shortages, service disruptions, and other unanticipated events, which may adversely affect our supply of lab equipment, lab supplies, chemicals, reagents, supplies, and lab services. For some suppliers, we do not enter into long- term agreements and instead secure our materials and services on a purchase order basis. Our suppliers may reduce or cease their supply of materials or services to us at any time in the future. If the supply of materials or services is interrupted, our programs may be delayed. We depend on a limited number of suppliers for critical items, including lab consumables and equipment, for the development of our programs. Some of these suppliers are single-source suppliers. We do not currently have the infrastructure or capability internally to manufacture these items at the necessary scale or at all. Although we have a reserve of supplies and although alternative suppliers exist for some of these critical products, services, and equipment, our existing processes used in our Foundry have been designed based on the functions, limitations, features, and specifications of the products, services, and equipment that we currently utilize. While we work with a variety of domestic and international suppliers, our suppliers may not be obligated to supply products or services or our arrangements may be terminated with relatively short notice periods. Additionally, we do not have any control over the process or timing of the acquisition or manufacture of materials by our manufacturers and cannot ensure that they will deliver to us the items we order on time, or at all. In particular, we rely on Twist for custom DNA synthesis and Thermo Fisher Scientific Inc. and others for certain instruments and consumables. The price and availability of DNA, chemicals, reagents, equipment, consumables, and instruments have a material impact on our ability to provide ~~Foundry~~ **Cell Engineering** services ~~. We may rely on contract manufacturers like Fermic, s. a. de. c. v for scale- up fermentation development, fermentation, and manufacturing of products for some customers~~ . The loss of the products, services, and equipment provided by one or more of our suppliers could require us to change the design of our research, development, and manufacturing processes based on the functions, limitations, features, and specifications of the replacement items or seek out a new supplier to provide these items. Additionally, as we grow, our existing suppliers may not be able to meet our increasing demand, and we may need to find additional suppliers. We may not be able to secure suppliers who provide lab supplies at, or equipment and services to, the specification, quantity, and quality levels that we demand (or at all) or be able to negotiate acceptable fees and terms of services with any such suppliers. As described above, some lab equipment, lab consumables, and other services and materials that we purchase are purchased from single-source or preferred suppliers, which limits our negotiating leverage and our ability to rely on additional or alternative suppliers for these items. Our dependence on these single- source and preferred suppliers exposes us to certain risks, including the following: ~~•~~ our suppliers may cease or reduce production or deliveries, raise prices, or renegotiate terms; ~~•~~ we may be unable to locate a suitable replacement on acceptable terms or on a timely basis, if at all; ~~•~~ if there is a disruption to our single-source or preferred suppliers' operations, and if we are unable to enter into arrangements with alternative suppliers, we will have no other means of continuing the relevant research, development, or manufacturing operations until they restore the affected facilities or we or they procure alternative sources of supply; ~~•~~ delays caused by supply issues may harm our reputation, frustrate our customers, and cause them to turn to our competitors for future programs; and ~~•~~ our ability to progress the development of existing programs and the expansion of our capacity to begin future programs could be materially and adversely impacted if the single- source or preferred suppliers upon which we rely were to experience a significant business challenge, disruption, or failure due to issues such as financial difficulties or bankruptcy, issues relating to other customers such as regulatory or quality compliance issues, or other financial, legal, regulatory, or reputational issues. Moreover, to meet anticipated market demand, our suppliers may need to increase manufacturing capacity, which could involve significant challenges. This may require us and our suppliers to invest substantial additional funds and hire and retain the technical personnel who have the necessary experience. Neither we nor our suppliers may successfully complete any required increase to existing research, development, or manufacturing capacity in a timely manner, or at all. For the year ended December 31, ~~2022~~ **2023** , our cost of lab equipment, lab supplies, and lab services accounted for a significant portion of our total R & D expenses. In the event of price increases by suppliers, whether as a result of inflationary pressures or otherwise, we may attempt to pass the increased costs to our customers. However, we may not be able to raise the prices of our ~~Foundry~~ **Cell Engineering** services sufficiently to cover increased costs resulting from increases in the cost of our materials and services, or the interruption of a sufficient supply of materials or services. As a result, materials and services costs, including any price increase for our materials

and services, may negatively impact our business, financial condition, and results of operations. Some of our suppliers and contract manufacturers are foreign entities. We may face disruptions due to the inability to obtain customs clearances in a timely manner or restrictions on shipping or international travel ~~due to the COVID- 19 pandemic~~ . As a result of ongoing global supply chain challenges resulting in very long lead times for certain products and equipment, we may order in larger volumes in order to secure the supplies we require for our future operations, which may negatively impact our financial conditions, especially if we are unable to use the supplies ordered. We use biological, hazardous, flammable and / or regulated materials that require considerable training, expertise and expense for handling, storage and disposal and may result in claims against us. We work with biological and chemical materials that could be hazardous to human, animal, or plant health and safety or the environment. Our operations produce hazardous and biological waste products, and we largely contract with third parties for the disposal of these products. Federal, state, and local laws and regulations govern the use, generation, manufacture, storage, handling, and disposal of these materials and wastes. Compliance with applicable laws and regulations is expensive, and current or future laws and regulations may restrict our operations. If we do not comply with applicable laws and regulations, we may be subject to fines and penalties. In addition, we cannot eliminate the risk of (a) accidental or intentional injury or (b) release, or contamination from these materials or wastes, which could expose us to liability. Furthermore, laws and regulations are complex, change frequently, and have tended to become more stringent. We cannot predict the impact of such changes and cannot be certain of our future compliance. Accordingly, in the event of release, contamination, or injury, we could be liable for the resulting harm or penalized with fines in an amount exceeding our resources and our operations could be suspended or otherwise adversely affected. These liabilities could also include regulatory actions, litigation, investigations, remediation obligations, damage to our reputation and brand, supplemental disclosure obligations, loss of customer, consumer, and partner confidence in the safety of our laboratory operations, impairment to our business, and corresponding fees, costs, expenses, loss of revenues, and other potential liabilities, as well as increased costs or loss of revenue or other harm to our business. The release of GMOs or Genetically Modified Materials, whether inadvertent or purposeful, into uncontrolled environments could have unintended consequences, which may result in increased regulatory scrutiny and otherwise harm our business and financial condition. The genetically engineered organisms and materials that we develop may have significantly altered characteristics compared to those found in the wild, and the full effects of deployment or release of our genetically engineered organisms and materials into uncontrolled environments may be unknown. In particular, such deployment or release, including an unauthorized release, could impact the environment or community generally or the health and safety of our employees, our customers' employees, and the consumers of our customers' products. In addition, if a high profile biosecurity breach or unauthorized release of a biological agent occurs within our industry, our customers and potential customers may lose trust in the security of the laboratory environments in which we produce GMOs **, Genetically Modified Microorganisms (" GMMs ")** and Genetically Modified Materials, even if we are not directly affected. Any adverse effect resulting from such a release, by us or others, could have a material adverse effect on the public acceptance of products from engineered cells and our business and financial condition. Such a release could result in increased regulatory scrutiny of our facilities, platform, and programs, and could require us to implement additional costly measures to maintain our regulatory permits, licenses, authorizations and approvals. To the extent such regulatory scrutiny or changes impact our ability to execute on existing or new programs for our customers, or make doing so more costly or difficult, our business, financial condition, or results of operations may be adversely affected. In addition, we could have exposure to liability for any resulting harm, as well as to regulatory actions, litigation, investigations, remediation obligations, damage to our reputation and brand, supplemental disclosure obligations, loss of customer, consumer, and partner confidence in the safety of engineered cells materials and organisms, impairment to our business, and corresponding fees, costs, expenses, loss of revenues, and other potential liabilities, as well as increased costs or loss of revenue or other harm to our business. We could synthesize DNA sequences or engage in other activity that inadvertently contravenes biosecurity requirements, or regulatory authorities could promulgate more far- reaching biosecurity requirements that our standard business practices cannot accommodate, which could give rise to substantial legal liability, impede our business, and damage our reputation. The Federal Select Agent Program (" FSAP ") involves rules administered by the Centers for Disease Control and Prevention and the USDA' s APHIS that regulate possession, use, and transfer of biological select agents and toxins that have the potential to pose a severe threat to public, animal, or plant health or to animal or plant products. In accordance with the International Gene Synthesis Consortium' s (" IGSC ") Harmonized Screening Protocol for screening of synthetic DNA sequence orders, we follow biosafety and biosecurity industry practices and avoid DNA synthesis activities that implicate FSAP rules by screening synthetic DNA sequence orders against the IGSC' s Regulated Pathogen Database; however, we could err in our observance of compliance program requirements in a manner that leaves us in noncompliance with FSAP or other biosecurity rules. In addition, authorities could promulgate new biosecurity requirements that restrict our operations. One or more resulting legal penalties, restraints on our business or reputational damage could have material adverse effects on our business, financial condition, or results of operations. Third parties may use our engineered cells, materials, and organisms and accompanying production processes in ways that could damage our reputation. After our customers have received our engineered cells, materials, and organisms and accompanying production processes, we do not have any control over their use and our customers may use them in ways that are harmful to our reputation. In addition, while we have established biosecurity offerings designed to comply with biosafety and biosecurity requirements and export control requirements in an effort to ensure that third parties do not obtain our engineered cells or other biomaterials for malevolent purposes, we cannot guarantee that these preventative measures will eliminate or reduce the risk of the domestic and global opportunities for the misuse or negligent use of our engineered cells materials, organisms and production processes. Accordingly, in the event of such misuse or negligent use, our reputation, future revenue, and operating results may suffer. International expansion of our business exposes us to business, regulatory, political, operational, financial, and economic risks associated with doing business outside of the United States. We currently market our services and deliver our programs, materials, and processes outside of the United States

and may market future offerings outside of the United States. We, and our suppliers, collaborators, and customers, currently conduct business outside of the United States. From time to time, our services may include the hiring or secondment of our employees outside the United States at third party facilities or require the hiring or secondment of foreign persons within our facilities, including as a result of foreign acquisitions. Accordingly, we are subject to a variety of risks inherent in doing business internationally, and our exposure to these risks will increase as we continue to expand our operations and customer base. These risks include: • political, social and economic instability; • ~~• fluctuations in currency exchange rates;~~ • higher levels of credit risk, corruption, and payment fraud; • enhanced difficulties of integrating any foreign acquisitions; • increased expenses and diversion of our management' s attention from advancing programs; • regulations that might add difficulties in repatriating cash earned outside the United States and otherwise prevent us from freely moving cash; • import and export controls and restrictions and changes in trade regulations; • compliance with the U. S. Foreign Corrupt Practices Act, the U. K. Bribery Act, and similar laws in other jurisdictions; • multiple, conflicting and changing laws and regulations such as privacy, security and data use regulations, tax laws, tariffs, trade regulations, economic sanctions and embargoes, employment laws, anti-corruption laws, regulatory requirements, reimbursement or payor regimes and other governmental approvals, permits and licenses; • failure by us, our collaborators or our customers to obtain regulatory clearance, authorization or approval for the use of our services in various countries; • additional potentially relevant third- party patent rights; • complexities and difficulties in obtaining intellectual property protection and enforcing our intellectual property; • difficulties in staffing and managing foreign operations, including difficulties related to the increased operations, travel, infrastructure and legal compliance costs associated with international locations; • logistics and regulations associated with shipping chemicals, biomaterials and product samples, including infrastructure conditions and transportation delays; • financial risks, such as longer payment cycles, difficulty collecting accounts receivable **, widespread inflationary pressure** , the impact of local and regional financial crises, on demand and payment for our products and exposure to foreign currency exchange rate fluctuations; • natural disasters, political and economic instability, including wars ~~(including the Russian invasion of Ukraine)~~ , terrorism and political unrest, the outbreak of disease, or public health epidemics / pandemics, such as COVID- 19, which could have an adverse impact on our employees, contractors, customers, partners, travel and the global economy; • breakdowns in infrastructure, utilities and other services; • boycotts, curtailment of trade and other business restrictions; and • the other risks and uncertainties described in this Annual Report ~~on Form 10- K~~ . Additionally, as part of our growth strategy, we will continue to evaluate potential opportunities for international expansion. Operating in international markets requires significant resources and management attention and will subject us to regulatory, economic and political risks in addition to those we face in the United States. However, our international expansion efforts may not be successful, which could limit the size of our market or the ability to provide services or programs internationally. In addition, due to potential costs from any international expansion efforts and potentially higher supplier costs outside of the United States, our international operations may operate with a lower margin profile. As a result, our margins may fluctuate as we expand our operations and customer base internationally. Any of these factors could significantly harm our future international expansion and operations and, consequently, our revenue and results of operations. **Our investments in and use of AI may result in reputational harm, liabilities, or other adverse consequences to our business operations. In August 2023, we entered into a strategic partnership with Google Cloud to develop and deploy AI tools for biology and biosecurity. Under the strategic partnership, Ginkgo will work to develop new, state- of- the- art large language models (LLMs) running on Google Cloud' s Vertex AI platform across genomics, protein function, and synthetic biology, helping Ginkgo' s customers accelerate innovation and discovery in fields as diverse as drug discovery, agriculture, industrial manufacturing, and biosecurity. Our development and use of AI technology in our products and operations remains in the early phases. While we aim to develop and use AI responsibly and attempt to mitigate ethical and legal issues presented by its use, we may ultimately be unsuccessful in identifying or resolving issues before they arise. There is no guarantee that Ginkgo will be successful in developing AI tools and as with many innovations, the use of AI presents many risks and challenges, including misuse, flawed algorithms, and insufficient and / or biased datasets. Additionally, AI technologies are complex and rapidly evolving. Uncertainty around new and emerging AI technologies may require additional investment to remain commercially relevant and / or to develop appropriate protections and safeguards. These investments may be costly and could increase our expenses as we contemplate expanding the use of AI in our platform and services. In addition, perceived or actual technical, legal, compliance, privacy, security, ethical or other issues relating to the use of AI may cause public confidence in AI to be undermined, which could slow our customers' adoption of our products and services that use AI. We may also face significant potential disruption as a result of rapidly evolving domestic and international laws and regulations, which could impose significant costs and obligations on the company. For example, in 2023 the Biden Administration issued a new, executive order on safe, secure and trustworthy AI and the EU introduced the AI Act to establish rules for providers and users. Emerging regulations may pertain to data privacy, data protection, and the ethical use of AI, as well as clarifying intellectual property considerations. Challenges inherent to the use of AI or specific to Google' s AI systems could adversely impact the reliability of our data and subject us to delays and competitive harm, result in new or enhanced governmental or regulatory scrutiny, pose confidentiality or security risks, ethical concerns, or legal liability, as well as brand or reputational harm, and our business and results of operations may suffer.** Risks Related to Our Customers We rely on our customers to develop, produce and manufacture products using the engineered cells **, other biological assets** and / or biomanufacturing processes that we develop. If these initiatives by our customers are not successful or do not achieve commercial success, or if our customers discontinue their development, production and manufacturing efforts using our engineered cells **, other biological assets** and / or biomanufacturing processes, our future financial position may be adversely impacted. We operate as a platform company. As such, we rely on our customers to commercialize products that may be enabled by our engineered cells **, other biological assets (e. g., enzyme DNA**

sequences) and / or biomanufacturing processes. A portion of the value in our customer collaborations is typically earned through downstream value sharing in the form of equity, royalty streams, or milestone payments. If our customers are not successful in bringing these products to market, or if these products are not successful once on the market, the downstream portion of our value will be adversely impacted. Because we do not directly control manufacturing, product or downstream process development or commercialization, we have limited ability to impact the quality of our partners' production processes and ultimate commercial success. In addition, our customers **have chosen, and** may ~~simply~~ **in the future** choose **,** not to develop or commercialize a product we have enabled in which we are entitled to downstream value sharing. In our current relationships, we would have limited or no recourse to find alternative methods to monetize these products without the original customer. Because this industry is still nascent and the regulatory environment is evolving, we have limited historical information on the probability of commercial success for bioengineered products or biomanufacturing processes in the market and have limited ability to underwrite the likelihood that our customers will be able to create valuable products or processes in their market using the results of their programs with us. If we overestimate the probability or scale of commercial success, the price of our common stock may be adversely impacted as a result of lower expectations for future cash flows from customer collaborations. Our revenue is concentrated in a limited number of customers, some of which are related parties, and our revenue, results of operations, cash flows and reputation may suffer upon the loss of a significant customer. We have derived, and may continue to derive, a significant portion of our revenue from a limited number of large customers. During the year ended December 31, ~~2022~~ **2023** , two customers each represented more than 10 % of our total revenue and cumulatively represented ~~22~~ **23** % of our total revenue. Due to the significant time required to acquire new customers, to plan and develop new programs for customers, and to satisfactorily execute on existing programs, the loss of any of these customers, or the loss of any other significant customer or a significant reduction in the amount of demand from a significant customer would adversely affect our revenue, results of operations, cash flows and reputation in the marketplace. There is always a risk that existing customers will not elect to do business with us in the future or will experience financial difficulties. If our customers experience financial difficulties or business reversals which reduce or eliminate the need for our services, they may be unable or unwilling to fulfill their contracts with us. There is also the risk that our customers will attempt to impose new or additional requirements on us that reduce the profitability of the services performed by us. Our customer concentration also increases the concentration of our accounts receivable and our exposure to payment defaults by key customers, which could expose us to substantial and potentially unrecoverable costs if we do not receive payment from key customers. Additionally, the loss of any significant customer could pose reputational harm to us and make it more challenging to acquire new customers. In addition, while our customer collaborations are typically multi- year, we generally do not require our customers to generate a minimum amount of annual demand and without such contracts, our customers are not obligated to use our services beyond the amounts they choose to incur. Our customers may choose to use fewer of our services depending on program progress, their own technological capabilities, market demand for their products and / or their own internal budget cycles. As a result, we cannot accurately predict our customers' decisions to reduce or cease utilizing our services. Even where we enter into long- term contracts with our customers, there is no guarantee that such agreements will be negotiated on terms that are commercially favorable to us in the long- term. In addition, existing customers may choose to perform some or all of the services they expect from us internally, with another third- party partner or by using capabilities from acquisitions of assets. In certain cases, our business partners may have discretion in determining when and whether to make announcements about the status of our collaborations, including about developments and timelines for advancing programs, and the price of our common stock may decline as a result of announcements of unexpected results or developments. Generally, we and our customers must mutually agree on determining when and whether to make announcements about the status of our collaborations, including developments in our programs and timelines for commercialization of or improvements to products using engineered cells developed using our platform. However, in some cases our customers may report or otherwise may be obligated to disclose certain matters without our consent. Our partners may also wish to report such information more or less frequently than we intend to or may not wish to report such information at all. We or our partners may announce a collaboration or partnership even if there is no guarantee that we will recognize program fees. The price of our common stock may decline as a result of a public announcement of unexpected results or developments in our partnerships, or as a result of our partners not consenting to an announcement or withholding information. ~~We may fail to realize the benefits and synergies expected from the Zymergen Acquisition, which could adversely affect our stock price. The anticipated benefits and synergies Ginkgo expects from the Zymergen Acquisition are, necessarily, based on projections and assumptions about the combined businesses of Ginkgo and Zymergen, which may not materialize as expected or which may prove to be inaccurate. The value of our Class A Common Stock could be adversely affected if we are unable to realize the anticipated benefits and synergies from the Zymergen Acquisition on a timely basis or at all. The benefits and synergies expected from the Zymergen Acquisition, which may not materialize or may prove to be inaccurate include the following: ● productivity improvements and corresponding decreases in unit costs as a result of Zymergen' s robotic automation and material conveyance technology; ● ability to accelerate scaling efforts while minimizing incremental run- rate operating expenses; ● acceleration of Ginkgo' s software development goals, including higher utilization and efficiency, due to Zymergen' s proprietary software and data stack; ● improvements and additions to Ginkgo' s Codebase; ● increased probability of program success and lower costs for customers; ● increased strain engineering expertise from knowledgeable Zymergen employees; and ● a pro forma cost structure that is materially less than the combined standalone cost structure of Ginkgo and Zymergen. We cannot predict with certainty if or when these benefits and synergies will be realized, or the extent to which they will actually be achieved. Realization of any benefits or synergies could be affected by the factors described in other risk factors and a number of factors beyond our control, including, without limitation, general economic conditions, increased operating costs and regulatory developments. We may be unable to appropriately integrate the business, operations and assets of Zymergen into our existing business. Achieving the benefits of the Zymergen Acquisition will depend, in part, on our ability to integrate the~~

~~business, operations and assets of Zymergen successfully and efficiently with our business. The challenges involved in this integration, which will be complex and time- consuming, include the following: ● difficulties integrating new and existing technologies, systems and processes into our platform and operations; ● successfully managing relationships with the combined supplier and customer base of Ginkgo and Zymergen; ● coordinating and integrating independent research and development and engineering teams across platforms while reducing costs; ● consolidating and integrating procurement, research, development and engineering activities and processes and customer and technical support and management and administrative functions; ● the ability to find partnerships, complete a potential sale or spin- out of Zymergen' s advanced materials and drug discovery businesses on favorable terms or at all; ● coordinating sales and marketing efforts to effectively position our capabilities and the direction of our platform; ● limitations or encumbrances on certain Zymergen intellectual property or other difficulties integrating Zymergen intellectual property into Ginkgo' s portfolio; ● the increased scale and complexity of our operations resulting from the Zymergen Acquisition; ● managing Zymergen' s real estate cost commitments; ● retaining key employees of Ginkgo and Zymergen; ● managing employee transition and severance costs; ● integrating and managing Ginkgo' s other acquisitions in addition to the Zymergen Acquisition; and ● minimizing the diversion of Ginkgo' s management' s attention from other important business objectives. If we do not successfully manage these issues and the other challenges inherent in integrating an acquired business of the size and complexity of Zymergen, then Ginkgo may not achieve the anticipated benefits of the Zymergen Acquisition and its revenue, expenses, operating results and financial condition could be materially adversely affected. There may be limited market interest in the product portfolio developed by Zymergen, which may limit our ability to create value from these assets. Zymergen' s business model involved developing products internally in areas as diverse as materials, drug discovery, agriculture, and consumer products. We plan to seek partners for these programs but we may not be successful. Furthermore, Zymergen' s strategy, in part, involves building a laboratory automation business, which may not be successful. Zymergen' s assumptions regarding and the data underlying the estimates of the total annual addressable markets and serviceable addressable markets may not be correct, and the conditions supporting assumptions or estimates may change at any time, thereby reducing the accuracy of the estimates. The future growth of current and any future products and solutions depends on many factors, including factors that are beyond our control. If demand for current and future products and solutions is smaller than estimated or does not develop as we expect, our growth may be limited and our business, financial condition and operational results may be adversely affected. The acquisition of Zymergen may result in significant charges or other liabilities that could adversely affect the financial results of the combined company. The financial results of the combined company may be adversely affected by cash expenses and non- cash accounting charges incurred in connection with Ginkgo' s integration of the business and operations of Zymergen. The amount and timing of these possible charges are not yet known. Our failure to identify or accurately assess the magnitude of certain liabilities, including in connection with Zymergen' s pending legal proceedings, could result in unexpected costs, including through litigation or regulatory exposure. Further, if we are unable to manage Zymergen' s real estate cost commitments or if we incur unfavorable accounting charges, unexpected increases in taxes due, a loss of anticipated tax benefits or other adverse effects, it may negatively impact Ginkgo' s business, operating results or financial condition. The price of our Class A Common Stock could decline to the extent the combined company' s financial results are materially affected by any of these events. For example, Zymergen incurred cash- based severance and stock- based compensation costs of approximately $ 7. 9 million and approximately $ 3. 5 million, respectively, related to the reduction in force it announced in October 2022 (the " October 2022 Reduction in Force ") and an aggregate of approximately $ 17. 7 million in cash- based severance costs when combined with the initial reductions in force that were announced on July 25, 2022 and August 25, 2022, including $ 2. 3 million of additional cash- based severance costs that were dependent on the consummation of a change in control event. Ginkgo' s future results will suffer if it does not effectively manage its expanded operations and geographic footprint following the Zymergen Acquisition. The size and scope of operations of the business of the combined companies has increased beyond the size and scope of operations of either Ginkgo' s or Zymergen' s businesses prior to the acquisition. Our future success depends, in part, upon our ability to manage our expanded business, which may pose substantial challenges for our management related to the management and monitoring of new operations and locations and associated increased costs and complexity. There can be no assurances that we will be successful in managing such expanded business or that we will realize the expected synergies and other benefits currently anticipated from the Zymergen Acquisition.~~ Risks Related to the COVID- 19 Pandemic **We** ~~The COVID- 19 pandemic and the global attempt to contain it may harm our business and results of operations. The full impact of the continuing COVID- 19 pandemic and related public health measures on our business will depend largely on future developments, including the duration and future severity of the pandemic, which remains highly uncertain. Extraordinary actions have been taken by international, federal, state and local public health and governmental authorities to contain and combat the outbreak and spread of COVID- 19 throughout the world, including travel bans, quarantines, capacity limitations at facilities, " stay- at- home " orders and similar mandates for many~~ **may** ~~individuals~~ **be subject** to **tort** ~~substantially restrict daily activities and for many businesses to curtail or cease normal operations. Additionally, our operations rely on the availability~~ **liability** ~~of laboratory scientists, engineers and facility, safety, quality and compliance personnel to work on- site. If a critical team member falls ill or needs to quarantine, or~~ if ~~a critical mass of our personnel falls ill or needs to quarantine, we may not be able to continue operations. The COVID- 19 pandemic has also had an adverse effect on our ability to attract, recruit, interview and hire at the pace we would typically expect to support our rapidly expanding operations, as well as on our ability to build out facilities to accommodate expanding operations. The COVID- 19 pandemic has had, and is expected to continue to have, an adverse impact on our operations, particularly as a result of preventive and precautionary measures that we, other~~ **the** ~~businesses, and governments are taking or may take in the future. We have continued to operate within the rules and guidance applicable at various points to our business during the pandemic and operations at third- party facilities have been similarly impacted by governmental mandates and guidelines; however, a continuing implementation of these restrictions, or the implementation of additional restrictions, could further impact our ability~~

~~to operate effectively and conduct ongoing R & D, laboratory operations, sales and marketing activities or other activities or operations, or lead to further compliance costs. We have also incurred expenses associated with our efforts to accommodate personnel during the COVID- 19 pandemic, including costs associated with the provision of COVID- 19 testing to our personnel, safety accommodations, providing on- site amenities and enhanced on- site cleaning efforts, and we will continue to incur such expenses associated with our operations. The pandemic has also caused substantial disruption in global supply chains. These interruptions may require us to suspend operations or delay programs. If we continually delay programs with existing customers, we may be in breach of our contracts with existing customers or customers may decide to cease doing business with us or have decreased demand for our products. We may also experience a slow- down in our pipeline of new programs or a termination of existing programs if our customers or potential customers face disruptions during the pandemic. Difficulties and delays such as those we have experienced and may experience in the future may prevent us from meeting our operating and financial goals, both in general and within our targeted timelines, and may cause our revenues and operating results to fluctuate from period to period. Uncertainty regarding the ongoing demand and / or capacity (including capacity at third party clinical testing laboratories) of our COVID- 19 individual and pooled sample tests and passive monitoring programs could materially adversely affect our business. Our biosecurity and public health offering Concentric by Ginkgo, consists of COVID- 19 testing and passive monitoring programs, which are subject to inherent risks of commercial viability, such as demand for tests, price or market share erosion due to competition and the duration of the COVID- 19 pandemic. We are in a highly competitive market – many companies have launched or are seeking to launch COVID- 19 testing products and many of these companies already have an existing commercial and technical infrastructure to market and commercialize such offerings. We have limited experience marketing or commercializing diagnostic or pooled sample testing programs and may not be able to sufficiently support operations with our current base of personnel or recruit enough experienced personnel who are in high demand, particularly healthcare professionals. Moreover, as vaccines for COVID- 19 and at- home or over- the- counter~~ COVID- 19 tests ~~continue to be widely available, and as infection rates decrease, demand for COVID- 19 testing may also decrease. Our COVID- 19 testing business relies heavily on the adoption of pooled testing in schools, which may be hesitant to adopt COVID- 19 testing without positive support from parents or teachers. Although~~ we **utilized** ~~make test validation results and protocols available to parents and teachers, they may not trust the accuracy of the tests or may have concerns about how the tests are performed, how samples are used or tracked and whether appropriate privacy measures are being taken with respect to individually identifiable health information, including genetic information. The ability for schools to pay for COVID- 19 testing relies heavily on the availability of federal, state or local funding for testing. If such funding is depleted, discontinued or otherwise becomes unavailable, or if there are restrictions on the use of such funding for our pooled sample test offerings, our COVID- 19 testing business may not be commercially viable. Our COVID- 19 testing business is subject to seasonality, and the demand for COVID- 19 testing~~ in ~~schools has significantly diminished, particularly in light of the White House' s announcement that the public health emergency will end in May 2023. In addition, as a result of the recent FDA EUA of a COVID- 19 vaccine for children five through eleven years of age, the demand for COVID- 19 testing in schools could diminish significantly or be eliminated. Creating the commercial and technical infrastructure to test on a mass scale is expensive. We may also be limited in our ability to scale up based on expense or unavailability of the required materials, equipment, personnel and infrastructure necessary to deliver diagnostic or pooled sample tests on a mass scale. We may not be able to recover our investment expenses with sufficient revenue generated by our diagnostic and pooled sample testing efforts. Our ability to commercialize~~ our testing programs ~~is also subject to regulatory or governmental controls, decisions or actions. If the HHS terminates its Declaration Justifying Emergency Use of Medical Countermeasures because the circumstances justifying emergency use no longer exist and, if the third- party COVID- 19 tests that are used in our testing services are not able to obtain premarket approval, clearance or other marketing authorization from the FDA, we may be unable to market or distribute these COVID- 19 tests, fulfill our contractual testing requirements or generate revenues from our test offerings. We may also experience price erosion if federal or state governments implement price controls or if the price of supply inputs increase. Finally, the sale of each test is dependent on the supply of the appropriate collection devices authorized for use with the COVID- 19 tests we utilize in our testing programs. Disruptions in this supply chain will have a material adverse effect on our ability to sell tests. Uncertainty regarding the sales and delivery of our COVID- 19 individual and pooled sample tests could materially adversely affect our business. Although we have partnerships with third party clinical testing laboratories to support a high volume of pooled sample testing for COVID- 19 nationally, pooled testing has not yet been adopted by all states nor have we established partnerships with clinical testing laboratories in all states. We are continuing to develop processes to scale capacity of COVID- 19 pooled sample collection and testing. However, we can give no assurance that we will be able to successfully scale the pooled sample collection and test capacity or that we will be able to establish or maintain the collaborative third party relationships that support such testing capacity. In addition, even if we are able to scale to high volume testing nationwide, there can be no assurance that the testing capacity will be used. We may be subject to tort liability if the COVID- 19 tests we utilize in our testing programs provide~~ **provided** inaccurate results. The Public Readiness and Emergency Preparedness Act (the " PREP Act ") provides immunity for manufacturers, distributors, program planners, qualified persons, and their officials, agents, and employees from certain claims under state or federal law for a " loss " arising out of the administration or use of a " covered countermeasure " in the United States. Distributors are certain persons or entities engaged in the distribution of drugs, biologics, or devices. Program planners include persons who supervise or administer a program with respect to the administration, distribution, provision, or use of a Covered Countermeasure (as defined in the PREP Act). Covered Countermeasures include security countermeasures and " qualified pandemic or epidemic products, " including products intended to diagnose or treat pandemic or epidemic disease, such as COVID- 19 diagnostic tests, as well as treatments intended to address conditions caused by such products. Covered Countermeasures must also be approved, cleared, or authorized for emergency use, or otherwise authorized for investigational use, by the FDA in order to be considered Covered Countermeasures under the PREP Act. For these immunities to apply, the

Secretary of HHS must issue a declaration in cases of public health emergency or " credible risk " of a future public health emergency. On March 10, 2020, the Secretary of HHS issued a declaration under the PREP Act and has issued subsequent amendments thereto to provide liability immunity for activities related to certain countermeasures against the COVID- 19 pandemic. We **have** ~~act~~ **acted** as the authorized distributor of certain third- party COVID- 19 tests and collection kits that ~~have~~ received an EUA and ~~supervise~~ **supervised** testing programs for ~~our~~ COVID- 19 testing customers. There can be no assurance that our test distribution and program planning activities regarding these programs would be covered under the provisions of the PREP Act. Also, there can be no assurance that the U. S. Congress will not act in the future to reduce coverage under the PREP Act or to repeal it altogether. Furthermore, some of the third- party tests **that were** used as part of our pooled testing program ~~are~~ **were** not covered by an EUA and, at this time, we do not believe that such testing services, administration, or program planning related to our pooled testing program will qualify for PREP Act immunity. If product liability lawsuits are brought against us in connection with allegations of harm connected to our **prior** COVID- 19 testing services, we may incur substantial liabilities ~~and may be required to limit our testing services~~ . The PREP Act is a complex law with limited judicial precedent, and thus even for the third- party COVID- 19 tests and collection kits used in our testing services that ~~are~~ **were** subject to EUAs, we may have to expend significant time and legal resources to obtain dismissal of a lawsuit on the basis of PREP Act immunity. If we cannot successfully defend ourselves against claims that our COVID- 19 testing services caused injuries and if we are not entitled to immunity under the PREP Act, or the U. S. Congress limits or eliminates coverage under the PREP Act, or if the liability protections under the PREP Act are not adequate to cover all claims, we may incur substantial liabilities. Regardless of merit or eventual outcome, product liability claims may result in decreased demand for our services, injury to our reputation, costs to defend litigation, loss of revenue, and substantial money awards to customers ~~. We are dependent on our relationships with our telehealth partner to provide healthcare services, and our business would be adversely affected if those relationships were disrupted or if our telehealth partner' s business model is affected by legal challenges. Our contractual relationships with our telehealth partner who provides physician authorization for COVID- 19 diagnostic and screening testing may implicate certain state laws in the United States that generally prohibit non- physician entities from practicing medicine, exercising control over physicians or engaging in certain practices such as fee- splitting with physicians. The ability to conduct telehealth services in a particular state is directly dependent upon the applicable laws governing remote healthcare, the practice of medicine and healthcare delivery in general in such location which are subject to changing political, regulatory and other influences. There can be no assurance that these laws will be interpreted in a manner consistent with our practices or that other laws or regulations will not be enacted in the future that could have a material and adverse effect on our business, financial condition and results of operations. Additionally, during the COVID- 19 public health emergency, many states enacted waivers and adopted other temporary measures that lifted certain restrictions on out- of- state providers and relaxed licensure requirements to allow greater access to telehealth services during the public health emergency period. At this time, we cannot predict whether these waivers or temporary measures will remain in place after the end of the public health emergency period. Accordingly, we must monitor compliance with laws in every jurisdiction in which we operate, and we cannot provide assurance that government authorities may nonetheless challenge our activities and arrangements with our telehealth partner and consider them non- compliant~~ . Risks Related to the Synthetic Biology Industry Rapidly changing technology and emerging competition in the synthetic biology industry could make the platform, programs, and products we and our customers are developing obsolete or non- competitive unless we continue to develop our platform and pursue new market opportunities. The synthetic biology industry is still emerging and is characterized by rapid and significant technological changes, frequent new product introductions and enhancements, and evolving industry demands and standards. Our future success will depend on our ability to sign and initiate new programs that address the evolving needs of our customers on a timely and cost- effective basis, to advance existing programs and to pursue new market opportunities that develop as a result of technological and scientific advances. Additionally, our customers may face significant competition or other risks which may adversely impact our business and results of operations. There are a number of companies in the broader synthetic biology industry, and our future success will depend on our ability to maintain a competitive position with respect to technological advances. Technological ~~development~~ **developments** ~~by others~~ **, including emerging AI technologies,** may result in our platform becoming obsolete. Our ability to compete successfully will depend on our ability to develop proprietary technologies that enable our customers to develop products using our platform in a manner that is either less expensive, faster, superior or otherwise differentiated from what a competitor' s technologies and products might enable. If we are unable to continue to successfully advance our platform or the services it provides at scale, or if our customers are unable to commercialize the products or processes made or improved upon by using our platform, our business and results of operations will be adversely impacted. Due to the significant lead time involved in launching a new program or developing a new product or process using our platform, our customers are required to make a number of assumptions and estimates regarding the commercial feasibility of a new product, including assumptions and estimates regarding the size of an emerging product category and demand for those end- products and processes which will use our technology, the ability to scale- up manufacturing processes to produce a product on a commercial scale, the ability to penetrate that emerging product category, customer adoption of a downstream product, the existence or non- existence of products being simultaneously developed by competitors, potential market penetration and obsolescence, planned or unplanned. As a result, it is possible that we may commence a new program with a customer who wishes to develop a product or process that has been displaced by the time of launch, addresses a market that no longer exists or is smaller than previously thought, that end- consumers do not like or otherwise is not competitive at the time of launch, in each case, after the incurrence of significant opportunity costs on our part to develop such product. The ultimate success of the products developed by our customers using our services may be dependent on the success of other markets in which we or our customers do not operate in or have knowledge or expertise or which, in each case, may not reach the size anticipated by us or our customers or may be replaced by another emerging product category or eliminated entirely. The market, including customers and potential investors, may be

skeptical of our ability to deliver on programs because they are based on a relatively novel and complex technology. The market, including customers and potential investors, may be skeptical of the viability and benefits of bioengineered products as well as our enabling abilities, including our platform and programs, because they are based on a relatively novel approach and the adoption of complex technology and because we are still demonstrating to the market the value of our platform. There can be no assurance that our platform and programs will be understood, approved, or accepted by customers, regulators and potential investors or that we will be able to sell our services profitably at competitive prices and with features sufficient to establish demand. In addition, in order for novel products from our programs to be successfully commercialized, support from the entire relevant supply chain is needed. Relationships with all parts of the supply chain are important in order to gain visibility into market trends and feature and specification requirements and in order to ensure customers are able to successfully manufacture their products, obtain regulatory approval and gain access to key distribution channels. If we are unable to convince these potential customers, their suppliers, or the consumers who purchase products containing or made or developed using engineered cells and / or biomanufacturing processes, of the utility and value of such products or that such products are superior to the products they currently use, we will not be successful in entering these markets and our business and results of operations will be adversely affected. If potential investors are skeptical of the success of our platform or cell programs, our ability to raise capital and the value of our common stock may be adversely affected. Ethical, legal and social concerns about GMOs and Genetically Modified Materials and their resulting products could limit or prevent the use of products or processes using our technologies, limit public acceptance of such products or processes and limit our revenues. Our technologies and the technologies of our customers involve the use of genetically modified cells, organisms and biomaterials, including, without limitation, GMOs, GMMs, Genetically Modified Materials and their respective products. The use, production and marketing of Genetically Modified Materials ~~,~~ are subject to laws and regulations in many countries, some of which are new and some of which are still evolving. In the United States, the FDA, the EPA and the USDA are the primary agencies that regulate the use of GMOs, GMMs and potential products derived from GMOs or GMMs. If regulatory approval of the Genetically Modified Materials or resulting products is not secured, our business operations, financial condition and our ability to grow as a business could be adversely affected. We expect to encounter regulations regarding Genetically Modified Materials in most, if not all, of the countries in which our customers may seek to establish production capabilities or sell their products and the scope and nature of these regulations will likely be different from country to country. Governmental authorities could, for safety, social or other purposes, impose limits on, or implement regulation of, the use, production or marketing of Genetically Modified Materials. If our customers cannot meet the applicable requirements in other countries in which they intend to produce or sell their products, or if it takes longer than anticipated to obtain such approvals, our business could be adversely affected. In addition, public perception regarding the safety and environmental hazards of, and ethical concerns over, Genetically Modified Materials or the processes used to create them, including gene editing or gene regulating technologies, could influence public acceptance of our and our customers' technologies, products, and processes. For instance, certain advocacy groups engage in efforts that include regulatory legal challenges and labeling campaigns for genetically modified products, as well as application of pressure to consumer retail outlets seeking a commitment not to carry genetically modified foods. These groups in the past have pressured retail food outlets and grocery store chains to publicly state that they will not carry genetically modified foods and have pressured food brands to publicly state that they will not use ingredients produced by genetically modified microbes. In addition, certain labeling- related initiatives have heightened consumer awareness of GMOs, which may make consumers less likely to purchase products containing GMO ingredients, and could have a negative impact on the commercial success of our customers' products and programs. These concerns could result in increased expenses, regulatory scrutiny, delays or other impediments to our programs. The subject of Genetically Modified Materials has received negative publicity, which has aroused public debate. This adverse publicity has led to, and could continue to lead to, greater regulation and trade restrictions on imports of Genetically Modified Materials or their resulting products. In addition, with the acquisitions of Dutch DNA Biotech B. V., FGen **AG** , and Altar **SAS** , we are expanding into the European Union market, which has increased government regulation and scrutiny over genetically modified products. There is a risk that products produced using our technologies could cause adverse health effects or other adverse events, which could also lead to negative publicity, regulatory action or private litigation. If we are unable to overcome the ethical, legal and social concerns relating to genetic engineering, our programs could face increased expenses, regulatory scrutiny, delays or other impediments to deliver our programs or the commercialization of resulting products and processes ~~. Finally, the COVID- 19 pandemic may increase biosecurity concerns by public and / or governmental stakeholders regarding genetic engineering technologies and risks around engineered viruses, microbes and organisms. Such concerns, restrictions, or governmental restrictions could limit the use of Genetically Modified Materials in our customers' products, which could have a material adverse effect on our business, financial condition and results of operations~~ . Risks Related to Intellectual Property If we are unable to obtain, maintain and defend patents protecting our intellectual property, our competitive position will be harmed. Our success depends in part on our ability to obtain and maintain intellectual property protection for our proprietary technologies. We protect our proprietary technologies through patents and trade secrets, both of which entail risk. If we are unable to obtain, maintain or protect intellectual property rights related to our technology, or if our intellectual property rights are inadequate, our competitive position, business, financial conditions, results of operations and prospects may be harmed. Because of the volume and nature of our inventions, patent protection may not be practicable, available, or appropriate for some aspects of our proprietary technologies. While we own patents and pending patent applications in the United States and in foreign jurisdictions, these applications do not ensure the protection of our intellectual property. There may be prior art of which we are not aware. Additionally, obtaining, maintaining, defending and enforcing patents is costly, time consuming and complex, and we may not be able to file and prosecute all necessary or desirable patent applications, or maintain and enforce any patents that may issue from such patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our technologies before it is too late to obtain patent

protection. Although we enter into confidentiality agreements with parties who have access to confidential or patentable aspects of our R & D output, such as our employees, collaborators, consultants, advisors and other third parties, any of these parties may breach the agreements and disclose such output before a patent application is filed, thereby jeopardizing our ability to seek patent protection. Further, pending applications may not be issued or may be issued with claims significantly narrower than we currently seek. Patents for which claims have been allowed may be successfully challenged and invalidated. Unless and until our pending applications issue, their protective scope is impossible to determine and, even after issuance, their protective scope may be limited. Recent changes in patent law have made patents covering life science inventions more difficult to obtain and enforce. Further legislative changes or changes in the interpretation of existing patent law could increase the uncertainty and cost surrounding the prosecution of our owned patent applications and the maintenance, enforcement or defense of our owned patents. The Leahy- Smith America Invents Act (" the Leahy- Smith Act ") included changes that affect the way patent applications are prosecuted; redefine prior art; enable third- party submission of prior art to the United States Patent and Trademark Office (" USPTO ") during patent prosecution; and provide cost- effective avenues for competitors and other third parties to challenge the validity of patents at USPTO- administered post- grant proceedings, including post- grant review, inter partes review, and derivation proceedings. Thus, the Leahy- Smith Act and its continued implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business, financial condition, results of operations, and prospects. Other changes in the law may further detract from the value of life science patents and facilitate challenges to our patents. In some cases, we **develop inventions with the assistance of machine learning and other computational tools that may be considered to be AI, and we expect to** use **such tools** ~~genetic sequence information from naturally occurring organisms~~ , ~~which may not be patentable. Recent U. S. Supreme Court rulings have narrowed the scope of patent protection for naturally occurring sequences~~ and **to use generative AI,** ~~for inventions based on the observation and exploitation of natural phenomena. These decisions have weakened the rights of patent owners~~ in ~~certain situations~~ **future development** . The U. S. Court of Appeals for the Federal Circuit **(the " Federal Circuit ")** has **ruled** ~~also issued a series of rulings~~ that **inventions** ~~create~~ **created entirely by AI** ~~obstacles to the patenting of groups of genetic sequences that share~~ -- **are** ~~functional characteristics~~ **not patentable** , ~~making~~ **while the USPTO has sought public comment about how** it **could encourage the use of AI** ~~more difficult to obtain claims to certain genetic constructs, particularly antibodies. These changes~~ in **developing inventions. Because** the law ~~have created uncertainty~~ **is in flux** with respect to **AI- assisted inventions,** ~~the~~ **there** ~~validity~~ **is uncertainty** and ~~enforceability of~~ **risk associated with** ~~patents~~ **patenting such inventions** ~~covering natural and engineered sequences~~ . Depending on future actions by the U. S. Congress, the federal courts and the USPTO, the laws and regulations governing patents could change in unpredictable ways that could have a further material adverse effect on our patent rights and our ability to protect, defend and enforce our patent rights in the future. **It is also possible that disclosure requirements with respect to use of AI tools may be imposed by the patent office, which could increase the cost of patent prosecution and cause uncertainty and delay in the enforcement of patent rights. In some cases, we use genetic sequence information from naturally occurring organisms. U. S. Supreme Court rulings have narrowed the scope of patent protection for naturally occurring sequences and for inventions based on the observation and exploitation of natural phenomena. These decisions have weakened the rights of patent owners in certain situations. The Federal Circuit and the Supreme Court have also issued a series of rulings that create obstacles to the patenting of groups of genetic sequences that share functional characteristics, making it more difficult to obtain claims to certain genetic constructs, particularly antibodies. These changes in the law have created uncertainty with respect to the validity and enforceability of patents covering natural and engineered sequences.** Further, the issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our patents may be challenged in the courts or patent offices in the United States and abroad. An adverse determination in any such challenge could result in loss of exclusivity, or patent claims being narrowed, invalidated or held unenforceable, in whole or in part. Any of these results could limit our ability to stop others from using or commercializing similar or identical technology to compete directly with us. In addition, if the breadth or strength of protection provided by our patents or patent applications is threatened, regardless of the outcome, it could dissuade companies from collaborating with us. Such proceedings also may result in substantial cost and require significant time from our scientists and management, even if the eventual outcome is favorable to us. The laws of some foreign countries do not protect intellectual property rights to the same extent as do the laws of the United States or may apply different rules concerning the assignment of intellectual property rights. Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. We may encounter similar difficulties, particularly as we expand to work with foreign employees and contractors and expand our collaboration activities into foreign markets. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents by foreign holders and, in some cases, do not favor the enforcement of patents at all, particularly patents in the life sciences. This could make it difficult for us to stop the infringement of our patents. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business and could be unsuccessful. Reductions in the scope or enforceability of our patent protection may adversely affect our customers' ability to commercialize their products and may thus reduce our downstream value from royalties, equity, or commercial milestone payments. If we are unable to protect the confidentiality of our trade secrets, our business and competitive position will be harmed. Because patent protection may not be available or appropriate for significant aspects of the technology we are developing, our success may depend in large part on our proprietary information, including genetic and other chemical and biological data, processes, know- how, and other trade secrets developed over years of R & D, some of which are embodied in proprietary software. We rely heavily on trade secret protections, especially in cases where we believe patents or other forms of registered intellectual property protection may not be appropriate or obtainable. However, trade secrets are difficult to protect. The secrecy of the Company' s trade secrets must be maintained

for them to retain their status and protection as trade secrets. While we strive to protect the secrecy of our trade secrets and other proprietary information, including by requiring our employees, customers, consultants, and contractors to enter into confidentiality agreements and instituting multilayered protections covering our digital environment and biomaterials, we may not be able to adequately protect our trade secrets or other proprietary information. We cannot guarantee that we have entered into such agreements with every party that may have or has had access to our trade secrets, biomaterials or proprietary technology and processes. Further, despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. We seek to preserve the integrity and confidentiality of our information by maintaining physical security of our premises and physical and electronic security of our information technology systems, but it is possible that these security measures could be breached. We also rely on systems provided by third parties, which may suffer security breaches or incidents. Such security breaches may be inadvertent or may come about due to intentional misconduct or other malfeasance or by human error or technical malfunctions, including those caused by hackers, employees, contractors, or vendors. It may be difficult or impossible to recover trade secrets or other confidential information once it is hacked, and hackers may operate from jurisdictions that will not cooperate with such efforts. Enforcing any claim that a third party unlawfully obtained and is using any of our trade secrets is expensive and time consuming, and the outcome is unpredictable. In addition, courts in some jurisdictions are less willing or unwilling to protect trade secrets even when a hacker or thief can be identified. Our competitors may lawfully obtain or independently develop knowledge that is equivalent to one or more of our trade secrets. Were they to do so, we would be unable to prevent them from using that independently developed knowledge. Such a competitor could claim that we had learned the trade secret from them and bring an action against us on that basis. If any of our trade secrets were to be disclosed to or independently developed by a competitor or other third party, our competitive position could be materially and adversely harmed. Moreover, a competitor could file for patent protection covering intellectual property that we have chosen to protect as a trade secret. In such a case, we might be restricted or excluded from using that intellectual property even if we had developed it before our competitor did. Our facilities hold large collections of microbial strains, cell lines and other biomaterials. Failure to implement adequate controls and protections, failure to implement adequate disposal procedures, unauthorized visitors in the labs, or customers' failure to adequately protect biological materials can put us and our customers at risk of losing valuable assets through negligence or theft and enabling the use of those lost materials by our competitors. While we believe that we take reasonable measures to protect the security of biomaterials owned by us or our customers, it is possible that our security controls and practices may not prevent unauthorized or other improper access to such genetic material. Any unauthorized access, acquisition, use, destruction, or release of the GMOs we engineer could result in our having exposure to significant liability under our contracts, as well as to regulatory actions, litigation, investigations, remediation obligations, damage to our reputation and brand, supplemental disclosure obligations, loss of customer, consumer, or partner confidence in the security of our platform, impairment to our business, and corresponding fees, costs, expenses, loss of revenues, and other potential liabilities. Our customers sometimes provide organisms, genetic material and / or data to us in connection with our collaborations. In the event that we fail to protect customer materials or data or inadvertently use such materials or data for unauthorized purposes, we could be liable to our customers under trade secret laws or contractual provisions. ~~There could be unintended consequences to the environment generally or the health and safety of our employees or the public as a result of an unauthorized release of Genetically Modified Materials into uncontrolled environments. In addition, if a biosecurity breach or unauthorized release of genetic material were to occur within our industry, our customers and potential customers might lose trust in the security of the laboratory environments in which we produce GMOs, even if we are not directly affected. Any adverse effect resulting from such a release, by us or others, could have a material adverse effect on the public acceptance of our products and business and our financial condition. Such a release could result in enhanced regulatory activity, and we could have exposure to liability for any resulting harm.~~ We may be subject to claims challenging the inventorship or ownership of our patents, biomaterials and other intellectual property. Certain of our employees, consultants and contractors were previously employed at universities or other software or biotechnology companies, including our competitors or potential competitors. Additionally, some of our consultants or contractors may have ongoing relationships with universities. Although we try to ensure that our employees, consultants and contractors do not use the intellectual property of others in their work for us, we may be subject to claims that these individuals or other contractors have used or disclosed intellectual property, including trade secrets or other proprietary information, of another. Litigation may result from these claims. While it is our policy to require that our employees, consultants and contractors who may be involved in the development of intellectual property for us execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who in fact develops intellectual property that we regard as our own. Our intellectual property assignment agreements with them may not be self-executing or may be breached, and we may be forced to bring claims against third parties, or defend claims they may bring against us, to determine the ownership of what we regard as our intellectual property. Such claims could have a material adverse effect on our business, financial condition, results of operations and prospects. If we are unsuccessful in litigating any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel, which could have a material adverse effect on our competitive business position and prospects. Such intellectual property rights could be awarded to a third party, and we could be required to obtain a license from such third party to use or commercialize our technology or products, which license might not be available on commercially reasonable terms, or at all. Even if we are successful in prosecuting or defending against such claims, litigation could result in substantial costs and be a distraction to our management and employees. The life science academic and research community has abided by norms of free exchange of biomaterials, but ~~recently,~~ norms have begun to change so that parties may assert ownership and control over biomaterials that they permitted to be freely disseminated in the past. Thus, despite our best efforts to confirm our right to use biomaterials in our possession, we may use organisms that we believe to be free of encumbrance that are, in fact, subject to claims of title by others.

In such a situation, litigation may be required to clear title, if it can be cleared at all. Similarly, we may be subject to claims that we have used biomaterials obtained from licensors or repositories for unauthorized purposes, or purposes not consistent with the licensing terms of the providing organization. We may become involved in lawsuits or other enforcement proceedings to protect or enforce our patents or other intellectual property, which could be expensive, time consuming and potentially unsuccessful. Competitors and other third parties may infringe or otherwise violate our issued patents or other intellectual property. In addition, our patents may become involved in inventorship, ownership, or priority disputes. We may also become subject to claims by collaboration partners that intellectual property or biomaterials that we believe to be owned by us are actually owned by them. Any litigation concerning any of these issues would be expensive, time consuming and uncertain. There can be no assurances that we would prevail in any suit brought by us or against us by third parties, or successfully settle or otherwise resolve those claims. Significant litigation would have substantial costs, even if the eventual outcome were favorable to us, and would divert management' s attention from our business objectives. Under certain circumstances, we may share or lose rights to intellectual property developed under U. S. federally funded research grants and contracts. Some of our inventions, data, or other intellectual property have been or may be developed during the course of research funded by the U. S. government. The U. S. government may have the right to take title to government- funded inventions if we fail to disclose the inventions to the government in a timely manner or fail to file a patent for the intellectual property within specified time limits. Further, in consequence of our receiving government funding, the U. S. government may have certain rights to intellectual property that we use in our platform or programs pursuant to the Bayh- Dole Act of 1980, as amended (the " Bayh- Dole Act "). Under the Bayh- Dole Act, U. S. government rights in certain " subject inventions " developed under a government- funded program may include a non- exclusive, irrevocable worldwide license to use inventions for any governmental purpose. In some circumstances, the U. S. government may acquire unlimited rights in data we generate. In addition, the U. S. government has the right to require us, or an assignee or exclusive licensee to U. S. Government- funded inventions, to grant licenses to any of these inventions to the government or a third party if the government determines that: (i) adequate steps have not been taken to commercialize the invention; (ii) government action is necessary to meet public health or safety needs; (iii) government action is necessary to meet requirements for public use under federal regulations; or (iv) the right to use or sell such inventions is exclusively licensed to an entity within the United States and substantially manufactured outside the United States without the U. S. government' s prior approval. Additionally, we may be restricted from granting exclusive licenses for the right to use or sell such inventions unless the licensee agrees to comply with relevant Bayh- Dole Act restrictions (e. g., manufacturing substantially all of the invention in the United States) and reporting requirements. In addition, the U. S. government may acquire title in any country in which a patent application is not filed. Certain technology and inventions are also subject to transfer restrictions during the term of these agreements with the U. S. government and for a period thereafter. These restrictions may limit sales of products or components, transfers to foreign subsidiaries for the purpose of the relevant agreements, and transfers to certain foreign third parties. If any of our intellectual property becomes subject to any of the rights or remedies available to the U. S. government or third parties pursuant to the Bayh- Dole Act, this could impair the value of our intellectual property and could adversely affect our business. The use of digital genetic sequence information may be subject to the Nagoya Protocol **or other treaties or local legislation concerning biodiversity** , which could increase our costs and adversely affect our business. The Nagoya Protocol is a supplemental agreement to the Convention on Biological Diversity (" CBD ") **that** ~~. The Nagoya Protocol~~ is designed to provide for equitable sharing of benefits arising from the utilization of genetic resources and traditional knowledge. **There are other international treaties, as well as local legislation in many countries, with similar objectives.** Under the Nagoya Protocol **and many other treaties and laws** , countries possessing genetic resources (" source countries ") are tasked with setting up procedures and institutional infrastructure for researchers to obtain prior informed consent, both from the source country and from any relevant indigenous or traditional communities, for biological research. Many have been slow to adopt workable institutions permitting the rational negotiation of benefit- sharing agreements. Many source countries are now asserting that the use of digital genetic sequence information is subject to the constraints of the Nagoya Protocol or similar national- or local- level benefit- sharing requirements. It is unclear whether this position will ultimately be adopted or what the implications of such adoption might be. It is unclear what a source country might assert if we used genetic sequences (i) extracted by a third party from a natural resource that was removed from its source country before that source country ratified the CBD or signed the Nagoya Protocol (ii) extracted by a third party and uploaded to public sequence databases after the source country ratified the CBD; (iii) in a heterologous host organism; or (iv) as a base for further engineering, so that the sequence we use no longer conforms to the natural sequence on which it was based. We make extensive use of public and proprietary sequence databases to support our work. While we undertake efforts to identify and comply with laws and international protocols relating to the use of genetic resources, the uncertainty surrounding the use of digital sequence information and the lack of workable institutions in many source countries for the efficient negotiation of benefit- sharing agreements may limit our use or cause uncertainty in our use of certain sequences that we obtain from public access databases or natural sources. New financial obligations may arise regarding our use of sequence information. Customers that must certify their compliance with Nagoya Protocol obligations may be reluctant to do business with us unless we engage in expensive and time- consuming benefit- sharing negotiations with source countries of publicly available genetic sequences. **Moreover, the World Intellectual Property Organization is considering requiring disclosures in patents of the origin of genetic resources, which may further increase uncertainty and the cost of patent prosecution.** These changes could increase our R & D costs and adversely affect our business, financial condition, and results. Third party patents may limit our freedom to operate in certain areas, which may adversely affect our business. There may be patents that affect our freedom to operate in certain areas, and we may as a result choose to design around or license such patents from third parties. If we must spend significant time and money designing around or licensing patents held by others, our business and financial prospects may be harmed. We may be restricted from carrying out certain operations in our Foundry, or we may be limited in our ability to design

new products for our customers. We may become subject to claims by third parties alleging that we are infringing, misappropriating, or otherwise violating their intellectual property rights. If we are sued for infringing, misappropriating, or otherwise violating intellectual property rights of third parties, such litigation could be costly and time consuming and could prevent or delay us from using our platform and technologies. ~~Any litigation~~ **Litigation** arising from ~~any dispute~~ **disputes** relating to the intellectual property of third parties **is** ~~would be~~ expensive, time- consuming, and uncertain. There can be no assurance that we ~~would~~ **will** prevail in ~~any~~ such ~~dispute~~ **disputes** . Parties making claims against us might be able to obtain injunctive or other relief, which could block our or our customers' ability to develop, commercialize and sell products or use our technologies, and could result in the award of substantial damages against us, including treble damages, attorney' s fees, costs and expenses if we were found to have willfully infringed. In the event of a successful claim against us, we or our customers might be required to pay damages and ongoing royalties, and obtain licenses from third parties, or be prohibited from selling certain products or using certain technologies. We may not be able to obtain these licenses on acceptable or commercially reasonable terms, if at all. In addition, we or our customers could encounter delays in product or service introductions while we attempt to develop alternative designs or redesign existing products or technologies to avoid or resolve these claims. Our loss in any lawsuit or failure to obtain a license could prevent us from using our platform and technologies. Such a loss or failure could materially affect our business and reputation. Any litigation pertaining to these issues would have substantial costs, even if the eventual outcome were favorable to us, and would divert management' s attention from our business objectives. If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected. Our registered or unregistered trademarks or trade names may be challenged, infringed, diluted, tarnished, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition among potential collaborators or customers in our markets of interest. At times, competitors may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement, dilution or tarnishment claims brought by owners of other trademarks or trademarks that incorporate variations of our registered or unregistered trademarks or trade names. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected. Our efforts to enforce or protect our proprietary rights related to trademarks, trade names, trade secrets, domain names, copyrights or other intellectual property may be ineffective and could result in substantial costs and diversion of resources and could adversely affect our business, financial condition, results of operations and prospects. Any claims or lawsuits relating to infringement of, misappropriating, or otherwise violating intellectual property rights brought by or against us will be costly and time consuming and may adversely affect our business, financial condition and results of operations. Any of the risks identified above could result in significant litigation. In addition to the specific litigation- related risks identified above, litigation of any kind carries certain inherent risks. Because of the substantial amount of discovery required in connection with litigation in U. S. courts, there is a risk that some of our confidential information could be compromised in the discovery process. There could be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on our share price. Further, our agreements with some of our customers, suppliers or other entities require us to defend or indemnify these parties if they become involved in infringement claims that target our products, services or technologies, or in certain other situations. If we must defend or indemnify third parties, we could incur significant costs and expenses that could adversely affect our business, operating results or financial condition. Intellectual property rights do not necessarily address all potential threats to our business. The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations and may not adequately protect our business or permit us to maintain our competitive advantage. The following examples are illustrative: ~~•~~ we may choose not to file a patent in order to maintain certain intellectual property as trade secrets or know- how, and a third party may subsequently file a patent covering such intellectual property; ~~•~~ others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our owned or licensed intellectual property rights; ~~•~~ the patents of others may harm our business; ~~•~~ we might not have been the first to make the inventions covered by the issued patents or pending patent applications that we own; ~~•~~ we might not have been the first to file patent applications covering certain of our inventions; and ~~•~~ issued patents that we hold rights to may fail to provide us with any competitive advantage, or may be held invalid or unenforceable, including as a result of legal challenges by our competitors. Should any of these events occur, they could harm our business, financial condition, results of operations and prospects. Intellectual property disputes of third parties and customers could have a material adverse effect on our business, financial condition, and results. We rely, and expect to continue to rely on, certain capital equipment, machinery, consumables, reagents, software, services and intellectual property that we purchase or license from third parties for use in our operations, platform, products, services and offerings. We cannot be certain that our vendors, suppliers, and licensors are not infringing upon the intellectual property rights of others or that they have sufficient rights to the third- party technology used in our business in all jurisdictions in which we may operate. Disputes with any of these third parties over uses or terms could result in the payment of additional royalties or penalties by us, cancellation or non- renewal of the underlying license, termination of supplies or rights to use, or litigation. In the event that we cannot resolve issues of this kind, we may be required to discontinue or limit our use of the operations, platform, products, services or offerings that include or incorporate the licensed intellectual property. Any such discontinuation or limitation could have a material and adverse impact on our business, financial condition and results of operation. Our customers may become involved in intellectual property disputes with third parties that are related or unrelated to any products or services we have supplied or rendered to them. Such disputes could result in a customer being unable to market its products, thus depriving us of license, milestone, or other revenues. Such deprivation could have a material adverse impact on our financial condition and

results. Our use of " open- source " software could negatively affect our ability to market or provide our services and could subject us to possible litigation. We have used " open- source " software in connection with the development and deployment of our software platform, and we expect to continue to use open- source software in the future. Open- source software is licensed by its authors or other third parties under open- source licenses, which in some instances may subject us to certain unfavorable conditions, including requirements that we offer our products that incorporate the open- source software for no cost, that we make publicly available all or part of the source code for any modifications or derivative works we create based upon, incorporating or using the open- source software, or that we license such modifications or derivative works under the terms of the particular open- source license. Companies that incorporate open- source software into their products have, from time to time, faced claims challenging the use of open- source software and compliance with open- source license terms. We could be subject to similar suits by parties claiming ownership of what we believe to be open- source software or claiming noncompliance with open- source licensing terms. While we monitor our use of open- source software and try to ensure that none is used in a manner that would require us to disclose our proprietary source code or that would otherwise breach the terms of an open- source agreement, we cannot guarantee that we will be successful, that all open- source software is reviewed prior to use in our platform, that our developers have not incorporated open- source software into our products that we are unaware of or that they will not do so in the future. Furthermore, there are an increasing number of open- source software license types, almost none of which have been interpreted by U. S. or foreign courts, resulting in a dearth of guidance regarding the proper legal interpretation of such licenses. As a result, there is a risk that open- source software licenses could be construed in a manner that imposes unanticipated conditions or restrictions on our ability to market or provide our products and services. If we are held to have breached or failed to fully comply with all the terms and conditions of an open- source software license, we could face infringement claims or other liability, or be required to seek costly licenses from third parties to continue providing our offerings on terms that are not economically feasible, if at all, to re- engineer all or a portion of our platform, to discontinue or delay the provision of our offerings if re- engineering could not be accomplished on a timely basis or to make generally available, in source code form, our proprietary code. Further, in addition to risks related to license requirements, use of certain open- source software carries greater technical and legal risks than does the use of third- party commercial software. For example, open- source software is generally provided without any support or warranties or other contractual protections regarding infringement or the quality of the code, including the existence of security vulnerabilities. To the extent that our platform depends upon the successful operation of open- source software, any undetected errors or defects in open- source software that we use could prevent the deployment or impair the functionality of our systems and injure our reputation. In addition, the public availability of such software may make it easier for others to compromise our platform. Any of the foregoing risks could materially and adversely affect our business, financial condition and results of operations. Risks Related to Personnel, IT and Physical Infrastructure Loss of key personnel, including our founders and senior executives, and / or failure to attract, train and retain additional key personnel could delay our cell engineering programs, harm our platform development efforts, limit our biosecurity and public health offerings, and harm our ability to meet our business objectives, particularly given the substantial investment required to recruit, hire and train our employees. Our business involves complex, global operations across a variety of markets and requires a management team and employee workforce that is knowledgeable in the many areas in which we operate. Our future success depends upon our ability to attract, train, retain and motivate highly qualified management, scientific, engineering, information technology, operations, business development and marketing personnel, among others. In addition, the market for qualified personnel is very competitive because of (a) the limited number of people available who have the necessary technical skills and understanding of our technology and products and (b) the nature of our industry which requires certain of our technical personnel to be on- site in our facilities. We compete for qualified technical personnel with other life sciences and information technology companies, as well as academic institutions and research institutions in the markets in which we operate, including: Massachusetts, USA; California, USA; The Netherlands; France; and Switzerland. In addition, as we add international operations, we will increasingly need to recruit qualified personnel outside the United States. However, doing so may also require us to comply with laws to which we are not currently subject, which could cause us to allocate or divert capital, personnel and other resources from our organization, which could adversely affect our business, financial condition, results of operations, prospects and reputation. Establishing international operations and recruiting personnel has **in the past** been ~~, and may continue to be,~~ impacted by COVID- 19 travel and operational restrictions. Our senior leadership team is critical to our vision, strategic direction, platform development, operations and commercial efforts. Our employees, including members of our leadership team, could leave our company with little or no prior notice and would be free to work for a competitor. We also do not maintain " key person " life insurance on any of our employees. The departure of one or more of our founders, senior leadership team members or other key employees could be disruptive to our business until we are able to hire qualified successors. Our continued platform development, growth and commercial success depends, in part, on recruiting and retaining highly- trained personnel across our various target industries and markets with the necessary background and ability to develop and use our platform and to effectively identify and sell to current and new customers. New hires and employees onboarded as a result of any of our recent acquisitions may require significant training and, in most cases, take significant time before they achieve full productivity. Our failure to successfully hire and integrate these key personnel into our business could adversely affect our business. To attract top talent, we believe we will need to offer competitive compensation and benefits packages, including equity incentive programs, which may require significant investment. If we are unable to offer competitive compensation this may make it more difficult for us to attract and retain key employees. Moreover, if the perceived value of our equity awards declines, it may adversely affect our ability to attract and retain key employees. If we do not maintain the necessary personnel to accomplish our business objectives, we may experience staffing constraints that adversely affect our ability to support our programs and operations. In addition, some of our personnel are qualified foreign nationals whose ability to live and work in the U. S. is contingent upon the continued availability of appropriate visas and whose ability to work on

some of our technologies may require the procurement of appropriate export licenses. Due to the competition for qualified personnel in the key markets in which we operate, we expect to continue to utilize foreign nationals to fill part of our recruiting needs. As a result, changes to United States immigration policies have restrained, and could further restrain, the flow of technical and professional talent into the United States and adversely affect our ability to hire and retain qualified personnel. Our business and results of operations are dependent on adequate access to laboratory and office space and suitable physical infrastructure, including electrical, plumbing, HVAC and network infrastructure, to conduct our operations. Our headquarters and certain of our laboratories are located in a flood zone in Boston' s Seaport District. Other facilities are located in active earthquake and tsunami zones or in active hurricane or wildfire zones. If we are unable to access enough space or we experience failures of our physical infrastructure, including due to natural ~~disaster~~ **disasters** affecting us or our suppliers, our business and results of operations could be adversely affected. Our business depends on providing customers with technical services. In order to properly conduct our business, we need access to sufficient laboratory space and equipment to perform the activities necessary to advance and complete our programs. Additionally, we need to ensure that our laboratories and corporate offices remain operational at all times, which includes maintaining suitable physical infrastructure, including electrical, plumbing and HVAC, logistics and transportation systems and network infrastructure. We own certain properties in California and lease most of our laboratories and office spaces. We rely on the landlords for basic maintenance of our leased laboratories and office buildings. If one of our landlords has not maintained a leased property sufficiently, we may be forced into an early exit from the facility, which could be disruptive to our business. Furthermore, we may continue to acquire laboratories not built by us in order to sufficiently scale and expand our output capacity. If we discover that these buildings and their infrastructure assets are not in the condition we expected when they were acquired, we may be required to incur substantial additional costs to repair or upgrade the laboratories. Problems in and around one or more of our laboratories or corporate offices, whether or not within our control, could result in service interruptions or significant infrastructure or equipment damage. These could result from numerous factors, including: ● human error; ● equipment failure; ● physical, electronic and cybersecurity breaches; ● fire, earthquake, hurricane, flood, tornado and other natural disasters; ● extreme temperatures; ● flood and / or water damage; ● fiber cuts; ● power loss; ● terrorist acts, including acts of bioterrorism; ● sabotage, vandalism and cyberattacks; and ● local epidemics or global pandemics such as the COVID- 19 pandemic. Certain of our facilities are located in an active earthquake and tsunami zone, and certain of our suppliers conduct their operations in the same region or in other locations that are susceptible to natural disasters. The occurrence of a natural or other disaster, such as an earthquake, tsunami, hurricane, drought, flood, fire, wildfire or any potential effects of climate change or localized extended outages of critical utilities or transportation systems, or any critical resource shortages affecting us or our suppliers or manufacturers could cause a significant interruption in our business, damage or destroy our facilities, production equipment or inventory or those of our suppliers and cause us to incur significant costs or result in limitations on the availability of our raw materials, any of which could harm our business, financial condition and results of operations. We have timeline obligations to certain customers with respect to their programs. As a result, service interruptions or significant equipment damage in our laboratories could result in difficulty maintaining program timelines for these customers and potential claims related to such failures. Because the services we provide in our laboratories are critical to many of our customers' businesses, service interruptions or significant equipment damage in our laboratories could also result in lost revenue or other indirect or consequential damages to our customers. We cannot guarantee that a court would enforce any contractual limitations on our liability in the event that one of our customers brings a lawsuit against us as a result of a problem at one of our laboratories and we may decide to reach settlements with affected customers irrespective of any such contractual limitations. In addition, any loss of service, equipment damage or inability to meet our service obligations could reduce the confidence of our customers and could consequently impair our ability to obtain and retain customers, which would adversely affect both our ability to generate revenues and our operating results. Furthermore, we are dependent upon internet service providers, telecommunications carriers and other website operators, some of which have experienced significant system failures and electrical outages in the past. Our customers may, in the future, experience difficulties due to system failures unrelated to our systems and offerings. If, for any reason, these providers fail to provide the required services, our business, financial condition and results of operations could be materially and adversely impacted. Risks Related to Financial Reporting We rely on our customers, joint venturers, equity investees and other third parties to deliver timely and accurate information in order to accurately report our financial results in the time frame and manner required by law. We need to receive timely, accurate, and complete information from a number of third parties in order to accurately report our financial results on a timely basis. If the information that we receive is not accurate or complete, or if a third party differs from us in its interpretation of accounting rules, our consolidated financial statements may be materially incorrect and may require restatement, or we may otherwise be required to correct our prior financial reporting. Although we have audit rights with third parties, performing such an audit could be expensive and time consuming and may not be adequate to reveal any discrepancies in a time frame consistent with our reporting requirements. We have had, and in the future may have, difficulty completing accurate and timely financial disclosures, which could have an adverse effect on our business. For example, we amended our 2021 Annual Report on Form 10- K to include significant investee financial statements in connection with one of our equity method investments. We use estimates in determining the fair value of certain assets and liabilities. If our estimates prove to be incorrect, we may be required to write down the value of these assets or write up the value of these liabilities, which could adversely affect our financial position. Our ability to measure and report our financial position and operating results is influenced by the need to estimate the fair value of an asset or liability. Fair value is estimated based on a hierarchy that maximizes the use of observable inputs and minimizes the use of unobservable inputs. Observable inputs are inputs that reflect the assumptions that market participants would use in pricing the asset or liability developed based on market data obtained from sources independent of the reporting entity. Unobservable inputs are inputs that reflect the reporting entity' s own assumptions about the assumptions market participants would use in pricing the asset or liability developed based on the best

information available in the circumstances. We estimate the impact or outcome of future events on the basis of information available at the time of the financial statements. An accounting estimate is considered critical if it requires that management make assumptions about matters that were highly uncertain at the time the accounting estimate was made. If actual results differ from management' s judgments and assumptions, then they may have an adverse impact on our results of operations and cash flows. Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited. We have incurred net losses since our inception and we may never achieve or sustain profitability. Generally, for U. S. federal income tax purposes, net operating losses incurred will carry forward. However, net operating loss carryforwards generated prior to January 1, 2018 are subject to expiration for U. S. federal income tax purposes. As of December 31, ~~2022~~ **2023**, we had federal net operating loss carryforwards of approximately $ 1 ~~,838~~. 0 ~~million~~ **billion**, of which $ 139. 2 million **will** begin to expire in 2029 and $ **884.** 1 ~~,698. 8~~ million can be carried forward indefinitely. As of December 31, ~~2022~~ **2023**, we had state net operating loss carryforwards of approximately $ ~~734~~ **998**. ~~1~~ **2** million, of which $ ~~661~~ **869**. ~~9~~ **2** million **will** begin to expire in 2030 and $ ~~72~~ **129**. ~~2~~ **0** million can be carried forward indefinitely. As of December 31, ~~2022~~ **2023**, we had foreign net operating losses of approximately $ 1. ~~4~~ **7** million, ~~of~~ which ~~$ 0. 5 million will begin to expire in 2030 and $ 0. 9 million~~ can be carried forward indefinitely. As of December 31, ~~2022~~ **2023**, we had federal research and development tax credit carryforwards of approximately $ ~~30~~ **40**. ~~3~~ **4** million **,** which begin to expire in 2029. As of December 31, ~~2022~~ **2023**, we also had state research and development and investment tax credit carryforwards of approximately $ ~~55~~ **30**. ~~7~~ **1** million **,** which begin to expire in 2030. Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an " ownership change, " generally defined as a greater than 50 % change by value in its equity ownership by certain stockholders over a three- year period, the corporation' s ability to use its pre- ownership change net operating loss carryforwards and other pre- ownership change tax attributes, such as research tax credits, to offset its post- ownership change income or taxes may be limited. Similar provisions of state tax law may also apply to limit the use of our state net operating loss carryforwards and other state tax attributes. We have not performed an analysis to determine whether our past issuances of stock and other changes in our stock ownership may have resulted in one or more ownership changes. If it is determined that we have in the past experienced an ownership change, or if we undergo one or more ownership changes as a result of future transactions in our stock, which may be outside our control, then our ability to utilize our net operating loss carryforwards and other tax attributes may be materially limited. As a result, even if we earn taxable income, we may be unable to use a material portion of our net operating loss carryforwards and other tax attributes, which could adversely affect our future cash flows. There is also a risk that regulatory changes, such as suspensions on the use of net operating losses or other unforeseen reasons, may result in our existing net operating loss carryforwards expiring or otherwise becoming unavailable to offset future taxable income. For these reasons, we may not be able to utilize a material portion of our net operating loss carryforwards and other tax attributes even if we attain profitability. We have identified **a** material ~~weaknesses~~ -- **weakness** in our internal controls over financial reporting, and we may identify additional material weaknesses in the future. A failure to maintain an effective system of internal control over financial reporting, may result in failure to accurately report our financial results or prevent fraud. As a result, stockholders could lose confidence in our financial and other public reporting, which would harm our business and the trading price of our common stock. SEC and New York Stock Exchange (" NYSE ") rules and regulations require, among other things, that we establish and periodically evaluate procedures with respect to our internal control over financial reporting. In addition, we are required to document and test our internal control over financial reporting pursuant to Section 404 of the Sarbanes- Oxley Act of 2002 so that our management can certify as to the effectiveness of our internal control over financial reporting. Likewise, our independent registered public accounting firm is required to attest to the effectiveness of our internal control over financial reporting. As disclosed in Part II ~~—~~ **-** Item 9A, " Controls and Procedures ", of this Annual Report ~~on Form 10- K~~ **(" Item 9A ")**, in connection with the audit of our financial statements for the year ended December 31, ~~2022~~ **2023**, we concluded that there ~~were two~~ **was a** material ~~weaknesses~~ -- **weakness** in our internal controls over financial reporting ~~: (1) we did not have effective management review controls to address the risks of material misstatement of various significant accounts, and we relied on external resources and specialists and did not maintain a sufficient complement of internal personnel with appropriate knowledge, experience and / or training commensurate with our technical accounting and financial reporting requirements in order to provide sufficient review and oversight over the level of precision, evidence and / or timeliness of management review controls; and (2) we did not have effective controls over the existence, completeness, and accuracy of data used in our controls and failed to maintain adequate information technology general controls over various key systems~~. The material ~~weaknesses~~ -- **weakness** identified in Item 9A did not result in any material misstatement of our financial statements ~~for any period presented~~. Our remediation efforts with respect to our identified material ~~weaknesses~~ -- **weakness** may be inadequate, and we may in the future discover other areas of our internal controls that require remediation. We cannot provide assurances that there will not be additional material weaknesses or significant deficiencies in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition, or results of operations. Any material weaknesses or significant deficiencies in our internal control over financial reporting could cause investors to lose confidence in the accuracy and completeness of our financial reports, the market price of shares of our common stock to decline, and result in sanctions or investigations by NYSE, the SEC or other regulatory authorities. Failure to remedy material weaknesses in our internal control over financial reporting or to implement or maintain other effective control systems could also restrict our future access to the capital markets. ~~Our cash and cash equivalents~~ **Adverse developments affecting the financial services industry** could ~~be~~ adversely ~~affected~~ -- **affect** ~~if~~ **our business operations, financial condition and results of operations. Actual or rumored events involving reduced or limited liquidity, defaults, non- performance or** ~~the~~ **other adverse developments that affect** financial institutions ~~in which we hold our~~ -- **or** ~~cash~~ **other companies in the financial services industry or the financial services industry generally, have in the past** and ~~cash equivalents fail~~ **may in the future lead to market- wide liquidity problems. For example, the closures of SVB,**

Signature Bank and First Republic Bank in the spring of 2023 created bank- specific and broader financial institution liquidity risk and concerns. Future adverse developments with respect to specific financial institutions or the broader financial services industry may lead to market- wide liquidity shortages, impair the ability of companies to access working capital needs, and create additional market and economic uncertainty . We regularly maintain cash balances at third- party financial institutions ~~, including Silicon Valley Bank,~~ in excess of the Federal Deposit Insurance Corporation insurance limit. ~~Silicon Valley Bank'~~ **Immediately following SVB'** s **receivership in 2023, we temporarily lost** ~~failure to return certain of our deposits has impacted~~ access to our ~~invested~~ cash ~~or~~ **and** cash equivalents **at SVB. While we regained access to all funds then held at SVB** , **any** ~~and a~~ similar failure of a depository institution to return ~~these~~ **our** deposits, or if a depository institution is subject to other adverse conditions in the financial or credit markets, could further impact access to our invested cash or cash equivalents and could adversely impact our operating liquidity and financial performance. **In addition, widespread investor concerns regarding the U. S. or international financial systems could result in less favorable commercial financing terms, including higher interest rates or costs and tighter financial and operating covenants, or systemic limitations on access to credit and liquidity sources, thereby making it more difficult for us to acquire financing on acceptable terms or at all. Any decline in available funding or access to our cash and liquidity resources could, among other risks, adversely impact our ability to meet our operating expenses, financial obligations or fulfill our other obligations, or result in breaches of our financial and / or contractual obligations. Any of these impacts, or any other impacts resulting from the factors described above or other related or similar factors not described above, could have material adverse impacts on our liquidity and our current and / or projected business operations and financial condition and results of operations.** Risks Related to Governmental Regulation and Litigation Failure to comply with federal, state, local and international laws and regulations could adversely affect our business and our financial condition. A variety of federal, state, local and international laws and regulations govern certain aspects of our business. For example, we maintain a registration from the DEA for the research of certain controlled substances and permits from the Boston Public Health Commission to conduct work with recombinant DNA. Some of our programs or products made or developed using our engineered cells and / or biomanufacturing processes are subject to regulations, including those promulgated by the FDA, DEA, EPA or USDA ~~. Products utilized in our COVID- 19 testing services are subject to regulations promulgated by the FDA, the Centers for Medicare and Medicaid Services, and certain state governments~~ . In addition, we are subject to laws relating to, among other things, anti- bribery, insider trading, sourcing of biological materials and data privacy. The legal and regulatory requirements that apply to our business may be interpreted and applied in a manner that is inconsistent from one jurisdiction to another or may conflict with other rules or our practices. As a result, our practices may not comply, or may not comply in the future with all such laws, regulations, requirements and obligations. Any failure, or perceived failure, by us to comply with any federal, state, local or international laws, regulations, industry self- regulatory principles, industry standards or codes of conduct, regulatory guidance, orders to which we may be subject or other legal obligations could adversely affect our reputation, brand and business, and may result in claims, proceedings or actions against us by governmental entities or others or other liabilities or require us to change our operations. We may also be contractually required to indemnify and hold harmless third parties from the costs or consequences of non- compliance with any laws, regulations or other legal obligations. We may also become subject to increasing regulation in the future as we expand our business. As we continue to expand our operations and offerings domestically and globally, we will have to expend significant management and financial resources to maintain compliant practices in those locations. Non- compliance could lead to litigation, which would require substantial management and financial resources. We may incur significant costs complying with environmental, health and safety laws and regulations, and failure to comply with these laws and regulations could expose us to significant liabilities. We use hazardous chemical and biological materials in our business and are subject to a variety of federal, state, local and international laws and regulations governing, among other matters, the use, generation, manufacture, transportation, storage, handling, disposal of, and human exposure to these materials, including regulation by governmental regulatory agencies, such as the Occupational Safety and Health Administration and the EPA. We have incurred, and will continue to incur, capital and operating expenditures and other costs in the ordinary course of our business in complying with these laws and regulations. Although we have implemented safety procedures for storing, handling and disposing of these materials and waste products in an effort to comply with these laws and regulations, we cannot be sure that our safety measures will be compliant or capable of eliminating the risk of injury or contamination from the generation, manufacturing, use, storage, transportation, handling, disposal of and human exposure to hazardous materials and / or flammable chemicals. Failure to comply with environmental, health and safety laws could subject us to liability and resulting damages. There can be no assurance that violations of environmental, health and safety laws will not occur as a result of human error, accident, equipment failure, contamination, intentional misconduct or other causes. Compliance with applicable environmental laws and regulations may be expensive, and the failure to comply with past, present or future laws could result in the imposition of fines, regulatory oversight costs, third party property damage, product liability and personal injury claims, investigation and remediation costs, the suspension of production or a cessation of operations, and our liability may exceed our total assets. Liability under environmental laws can be imposed for the full amount of damages without regard to comparative fault for the investigation and cleanup of contamination and impacts to human health and for damages to natural resources. Contamination at properties we may own and operate and at properties to which we send hazardous materials, may result in liability for us under environmental laws and regulations. Our business and operations may be affected by other new environmental, health and safety laws and regulations, which may require us to change our operations, or result in greater compliance costs and increasing risks and penalties associated with violations, which could impair our research, development or production efforts and harm our business. If we fail to comply with healthcare and other governmental regulations, we could face substantial penalties and our business, financial condition and results of operations could be adversely affected. Our business activities may be subject to regulation and enforcement by the FDA, U. S. Department of

Justice, HHS, Office of Inspector General, and other federal and state governmental authorities. Although our offerings are not currently billed to any third- party payor, including any commercial payor or government healthcare program, we may, in the future, submit claims for our ~~COVID- 19 testing~~ services to third- party payors, including government healthcare programs. If we submit claims to third- party payors, such activity will expand the scope of federal and state healthcare laws applicable to us. Federal and state healthcare laws and regulations that may affect our ability to conduct business include, without limitation: • the federal Anti- Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, offering, receiving or paying any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, lease, order, or arranging for or recommending the purchase, lease or order of, any item or service, for which payment may be made, in whole or in part, under federal healthcare programs such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation; • the federal physician self- referral prohibition, commonly known as the Stark Law, which prohibits a physician, in the absence of an applicable exception, from making a referral for certain designated health services covered by the Medicare or Medicaid program, including clinical laboratory services, if the physician or an immediate family member of the physician has a financial relationship with the entity providing the designated health services. The Stark Law also prohibits the entity furnishing the designated health services from billing, presenting or causing to be presented a claim for the designated health services furnished pursuant to the prohibited referral; • the federal civil false claims laws, including without limitation the federal False Claims Act (which can be enforced through " qui tam, " or whistleblower actions, by private citizens on behalf of the federal government), and civil monetary penalties laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, false or fraudulent claims for payment of government funds, or knowingly making, using or causing to be made or used, a false record or statement material to an obligation to pay money to the government or knowingly and improperly avoiding, decreasing or concealing an obligation to pay money to the federal government. In addition, the government may assert that a claim including items and services resulting from a violation of the federal Anti- Kickback Statute or Stark Law constitutes a false or fraudulent claim for purposes of the civil False Claims Act; • the EKRA, which created a new federal crime for knowingly and willfully: (1) soliciting or receiving any remuneration in return for referring a patient to a recovery home, clinical treatment facility, or laboratory; or (2) paying or offering any remuneration to induce such a referral or in exchange for an individual using the services of a recovery home, clinical treatment facility, or laboratory. Unlike the Anti- Kickback Statute, EKRA is not limited to services reimbursable under a government health care program, but instead extends to all services reimbursed by " health care benefit programs "; • the healthcare fraud statutes under HIPAA, which impose criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement, in connection with the delivery of, or payment for healthcare benefits, items or services by a healthcare benefit program, which includes both government and privately funded benefits programs. Similar to the federal Anti- Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation; • HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act (" HITECH ") enacted as part of the American Recovery and Reinvestment Act of 2009, and its implementing regulations, and as amended again by the Modifications to the HIPAA Privacy, Security, Enforcement and Breach Notification Rules Under HITECH and the Genetic Information Nondiscrimination Act; Other Modifications to the HIPAA Rules, commonly referred to as the Final HIPAA Omnibus Rule, published in January 2013, which imposes certain obligations, including mandatory contractual terms, on covered entities subject to HIPAA (i. e., health plans, healthcare clearinghouses and certain healthcare providers), as well as their business associates that perform certain services for or on their behalf involving the use or disclosure of individually identifiable health information, to safeguard the privacy, security and transmission of individually identifiable health information from any unauthorized use or disclosure; • the **U. S. Food, Drug, and Cosmetic Act (" FDCA ")** which imposes civil and criminal liability for engaging in any of a number of Prohibited acts, including distributing drugs, devices and foods that are adulterated or misbranded. To charge a criminal misdemeanor violation of the FDCA, no intent need be shown; • federal consumer protection and unfair competition laws, which broadly regulate platform activities and activities that potentially harm consumers; and • state law equivalents of each of the above federal laws, such as anti- kickback, self- referral, and fee- splitting, and false claims laws which may apply to items or services reimbursed by any third- party payor, including commercial insurers and self- pay patients. Because of the breadth of these laws and the narrowness of available statutory and regulatory exemptions, exceptions, and safe harbors, it is possible that some of our activities could be subject to challenge under one or more of such laws. We may face claims and proceedings by private parties, and claims, investigations and other proceedings by governmental authorities, relating to allegations that our business practices do not comply with current or future laws or regulations involving applicable fraud and abuse or other healthcare laws and regulations, and it is possible that courts or governmental authorities may conclude that we or any of our partners have not complied with them, or that we may find it necessary or appropriate to settle any such claims or other proceedings. Any action brought against us for violation of these or other laws or regulations, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management' s attention from the operation of our business. If our operations are found to be in violation of any federal or state laws described above or any other current or future fraud and abuse or other healthcare laws and regulations that apply to us, we may be subject to claims and proceedings by private parties, investigations and other proceedings by governmental authorities, as well as penalties, including significant criminal, civil and administrative penalties, damages and fines, disgorgement, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of noncompliance with these laws or regulations, imprisonment for individuals and exclusion from participation in government programs, such as Medicare and Medicaid, as well as contractual damages and

reputational harm. We could also be required to curtail or cease our operations. In addition, if any customers, healthcare professionals we engage, laboratory partners or other entities with whom we do business are found not to be in compliance with applicable laws, they may be subject to the same criminal, civil or administrative sanctions, including exclusion from government- funded healthcare programs. Any of the foregoing could seriously harm our business and financial results. ~~We may become subject to the comprehensive laws and rules governing billing and payment, noncompliance with which could result in non- payment or recoupment of overpayments for our services or other sanctions. We may, in the future, submit claims for our COVID- 19 testing services to third- party payors. Payors typically have differing and complex billing and documentation requirements. If we fail to comply with these payor- specific requirements, we may not be paid for our services or payment may be substantially delayed or reduced. Numerous state and federal laws would also apply to our claims for payment, including but not limited to (i) " coordination of benefits " rules that dictate which payor must be billed first when a patient has coverage from multiple payors, (ii) requirements that overpayments be refunded within a specified period of time, (iii) " reassignment " rules governing the ability to bill and collect professional fees on behalf of other providers, (iv) requirements that electronic claims for payment be submitted using certain standardized transaction codes and formats, and (v) laws requiring all health and financial information of patients to be maintained in a manner that complies with stringent security and privacy standards. Audits, inquiries and investigations from government agencies and health network partners can occur from time to time in the ordinary course of our business, and could result in costs to us and a diversion of management' s time and attention. New regulations and heightened enforcement activity also could negatively affect our cost of doing business and our risk of becoming the subject of an audit or investigation. If we bill for our service in the future, our failure to comply with rules related to billing or adverse findings from audits by government and private payors could result in, among other penalties, non- payment for services rendered or recoupments or refunds of amounts previously paid for such services. We cannot predict whether any future audits, inquiries or investigations, or the public disclosure of such matters, likely would negatively impact our business, financial condition, results of operations, cash flows and the trading price of our securities. See also " Risk Factors — Risks Related to Governmental Regulation and Litigation — If we fail to comply with healthcare and other governmental regulations, we could face substantial penalties and our business, financial condition and results of operations could be adversely affected. "~~ We and our laboratory partners are subject to a variety of laboratory testing standards, compliance with which is an expensive and time- consuming process, and any failure to comply could result in substantial penalties and disruptions to our business. We and the third- party laboratories that we partner with are subject to the CLIA. CLIA is a federal law that regulates clinical laboratories that perform testing on specimens derived from humans for the purpose of providing information for the diagnosis, prevention or treatment of disease. CLIA requires certain clinical laboratories to be certified by the federal government and mandates compliance with various operational, personnel, facilities administration, quality and proficiency testing requirements depending on the level of complexity for which the laboratory is certified. CLIA certification is also a prerequisite to be eligible to bill state and federal healthcare programs, as well as many private third- party payors, for laboratory testing services. Our partner laboratories hold CLIA certifications for high complexity testing, which mandate compliance with various operational, personnel, facilities administration, quality and proficiency testing requirements depending on the level of complexity for which the laboratory is certified. Sanctions for failure to comply with CLIA requirements may include suspension, revocation, or limitation of a laboratory' s CLIA certificate, as well as the imposition of significant fines or criminal penalties. Any sanction imposed under CLIA, its implementing regulations, or state or foreign laws or regulations governing licensure, or our partner laboratories' failure to renew a CLIA certificate, a state or foreign license, or accreditation, could have a material adverse effect on our business. In addition, our partner laboratories and our laboratories holding CLIA Certificates of Waiver are subject to state laws and regulations governing laboratory licensure. Some states have enacted state licensure laws that are more stringent than CLIA. ~~Our ability to successfully deploy COVID- 19 testing at large scale may be adversely impacted if our partner laboratories do not maintain the required regulatory licensure and operate in accordance with CLIA standards.~~ In certain markets such as California, New York, and Pennsylvania, we or our partner laboratories may also need to obtain and maintain additional licensure from such states. It is uncertain that our partner laboratories will be granted such licensure and, in such cases, we cannot offer testing to patients located in those states, which could limit our ability to offer testing on a wide scale. It is possible that additional states may enact laboratory licensure requirements in the future, which could further limit our ability to expand our services. We rely on third- party laboratories in the conduct of our biosecurity and public health business offerings. If any of our partners cease working with us, or face supply chain disruptions or other difficulties, our business could be harmed. ~~Specifically, if any of our partners were to lose or fail to obtain or renew their CLIA certifications or state laboratory licenses, whether as a result of a revocation, suspension or limitation, such laboratories would no longer be able to run the COVID- 19 tests we offer to our customers, and our ability to successfully deploy a COVID- 19 pooled sample testing program nationwide may be adversely impacted.~~ The testing industry is subject to complex and costly regulation and if government regulations are interpreted or enforced in a manner adverse to us, we may be subject to enforcement actions, penalties, exclusion, and other material limitations on our operations. We **have** ~~offer~~ **offered** COVID- 19 testing services by partnering with third- party laboratories, diagnostic test manufacturers and manufacturers of collection kits, which are subject to extensive and frequently changing federal, state and local laws and regulations governing various aspects of our business, including significant governmental certification and licensing regulations. New laws, regulations and judicial decisions, or new interpretations of existing laws, regulations and decisions, may also limit our potential revenues, and we may need to revise our R & D or commercialization programs. The costs of defending claims associated with violations, as well as any sanctions imposed, could significantly adversely affect our financial performance. **Our** ~~We are required to comply with federal and state genetic~~ testing ~~and privacy laws. We have measures in place~~ **does not identify nor sequence any individual human DNA or RNA nor can results be tied** to **any individual. As a result, we do not** collect ~~clinical data and genetic and other biological samples, and disclose test results, from subjects who have provided appropriate~~ informed consents **from any individual participating in our**

programs . However, ~~informed consents~~ **our approach** could be challenged in the future ~~, and~~ **based on** ~~those~~ -- **the claims** ~~informed consents could prove invalid, unlawful or otherwise inadequate for~~ - **or** ~~our purposes~~ **privacy considerations and searches governed by the 4th Amendment of the U. S. Constitution** . Any legal challenges could consume our management and financial resources. Current regulations governing the testing services we offer are shifting and in some cases unclear. In addition, our laboratory partners may be unsuccessful in validating, or obtaining or maintaining authorizations for, the tests we ~~rely~~ **relied** on to provide our **prior** COVID- 19 testing services. If any third- party manufacturers or laboratories offering tests that we use in our testing services are deemed by the FDA or other regulatory authorities to have violated applicable law or if the tests or test components are marketed, processed or distributed in violation of applicable law, we may be subject to enforcement action or litigation, or we may be required to find alternative tests to support our testing services, which could increase our costs ~~and prevent us from successfully commercializing our COVID- 19 testing services~~ . In addition, we are required to comply with applicable FDA regulations with respect to ~~our~~ distribution of certain COVID- 19 diagnostic test kits and collection kits, including, for certain kits, compliance with applicable terms and conditions of an EUA. Such conditions may include requirements related to collection of information on the performance of the product, reporting of adverse events, recordkeeping requirements, and labeling and promotional activities. To the extent that we market or promote third- party tests or test kits outside of the uses authorized for these products or in a false or misleading manner, the tests or collection kits could be considered misbranded or adulterated and distributing them in interstate commerce could violate the FDCA. Violations of applicable FDA requirements could result in enforcement actions, such as warning or " untitled " letters, revocation of EUAs, seizures, injunctions, civil penalties and criminal prosecutions and fines, and violation of the FTC Act could result in injunctions and other associated remedies, all of which could have a material adverse effect on our business. Most states also have similar regulatory and enforcement authority for laboratory testing and distribution of related collection kits. For example, many state laws require us to hold a specific form of license to distribute COVID- 19 diagnostic test kits and collection kits into such states. These requirements vary from one state to another and frequently change. Complying with state laws and regulations may subject us to similar risks and delays as those we could experience under federal regulation. Our surveillance testing efforts do not collect identifying individual data and do not return a diagnostic result, but some surveillance methods, such as double collection, require samples from individuals. Regulatory authorities could take issue with our characterization of such testing as surveillance and / or impose additional requirements or restrictions. Advertising for any of the tests or collection kits we distribute or the testing services we offer is also subject to regulation by the Federal Trade Commission (" FTC "), under the Federal Trade Commission Act (" FTC Act "). The FTC may take enforcement action for advertising claims that are not adequately substantiated or that are false or misleading. We are subject to federal and state laws and regulations governing the protection, use, and disclosure of health information and other types of personal information, and our failure to comply with those laws and regulations or to adequately secure the information we hold could result in significant liability or reputational harm. Numerous state and federal laws, regulations, standards and other legal obligations, including consumer protection laws and regulations, which govern the collection, dissemination, use, access to, confidentiality, security and processing of personal information, including health- related information, could apply to our operations or the operations of our partners. For example, HIPAA imposes privacy, security and breach notification obligations on certain healthcare providers, health plans, and healthcare clearinghouses, known as covered entities, as well as their business associates that perform certain services that involve creating, receiving, maintaining or transmitting individually identifiable health information for or on behalf of such covered entities, and their covered subcontractors. HIPAA requires covered entities and business associates to develop and maintain policies with respect to the protection of, use and disclosure of protected health information (" PHI "), including the adoption of administrative, physical and technical safeguards to protect such information, and certain notification requirements in the event of a breach of unsecured PHI. If in the future we engage in certain types of standard electronic transactions involving payors, including billing the Medicare or Medicaid programs or commercial health plans, we will be subject to HIPAA as a " covered entity. " We are currently subject to HIPAA as a " business associate " because we ~~perform~~ **performed** certain services involving the use or disclosure of PHI on behalf of covered entity customers with respect to our **prior** COVID- 19 testing service offerings. Implementation of the infrastructure necessary to meet HIPAA standards requires substantial investment. Being subject to HIPAA as a covered entity or business associate exposes us to significant fines and penalties, including criminal fines and penalties ~~. Additionally, under HIPAA, covered entities must report breaches of unsecured PHI to affected individuals without unreasonable delay, not to exceed 60 days following discovery of the breach by a covered entity or its agents. Notification also must be made to the HHS Office for Civil Rights and, in certain circumstances involving large breaches, to the media. Business associates must report breaches of unsecured PHI to covered entities within 60 days of discovery of the breach by the business associate or its agents. A non- permitted use or disclosure of PHI is presumed to be a breach under HIPAA unless the Covered Entity or Business Associate establishes that there is a low probability the information has been compromised consistent with requirements enumerated in HIPAA~~ . Entities that are found to be in violation of HIPAA as the result of a breach of unsecured PHI, a complaint about privacy practices or an audit by HHS, may be subject to significant civil, criminal and administrative fines and penalties and / or additional reporting and oversight obligations if required to enter into a resolution agreement and corrective action plan with HHS to settle allegations of HIPAA non- compliance. HIPAA also authorizes state attorneys general to file suit on behalf of their residents. Courts may award damages, costs and attorneys' fees related to violations of HIPAA in such cases. While HIPAA does not create a private right of action allowing individuals to sue us in civil court for violations of HIPAA, its standards have been used as the basis for duty of care in state civil suits such as those for negligence or recklessness in the misuse or breach of PHI. Even when HIPAA or a state law does not apply, according to the FTC, violating consumers' privacy rights or failing to take appropriate steps to keep consumers' personal information secure may constitute unfair and / or deceptive acts or practices in violation of Section 5 (a) of the FTC Act. The FTC expects a company' s data security measures to be reasonable and appropriate in light of the sensitivity and volume of consumer

information it holds, the size and complexity of its business, and the cost of available tools to improve security and reduce vulnerabilities. Several states have enacted privacy laws governing the use and disclosure of health information, such as the California Confidentiality of Medical Information Act; these laws are not preempted by HIPAA to the extent they are more stringent than HIPAA. Such laws and regulations will be subject to interpretation by various courts and other governmental authorities, thus creating potentially complex compliance issues for us and our partners. Further, in recent years, there have been a number of well- publicized data breaches involving the improper dissemination of personal information of individuals both within and outside of the healthcare industry. Laws in all 50 states require businesses to provide notice to individuals whose personally identifiable information has been disclosed as a result of a data breach. The laws are not consistent, and compliance in the event of a widespread data breach is costly. States are also constantly amending existing laws, and creating new data privacy and security laws, requiring attention to frequently changing regulatory requirements. For example, the California Consumer Privacy Act of 2018 (" CCPA ") went into effect on January 1, 2020. The CCPA creates new transparency requirements and grants California residents several new rights with respect to their personal information. Failure to comply with the CCPA may result in, among other things, significant civil penalties and injunctive relief, or potential statutory or actual damages. On November 3, 2020, California voters passed a ballot initiative for the California Privacy Rights Act (" CPRA "), which ~~will~~ significantly ~~expand~~ **expands** the CCPA ~~. Most CPRA provisions will take effect on January 1, 2023, though the obligations will apply to any personal information collected after January 1, 2022~~ . The CPRA ~~will impose~~ **imposes** additional data protection obligations on covered businesses, including additional consumer rights processes, limitations on data uses, new audit requirements for higher risk data, and opt outs for certain uses of sensitive data. It ~~will~~ also ~~create~~ **creates** a new California data protection agency authorized to issue substantive regulations and could result in increased privacy and information security enforcement. ~~The majority of the provisions will go into effect on January 1, 2023, and additional~~ **Additional** compliance investment and potential business process changes may be required ~~.~~ **to remain compliant with** ~~Similar~~ **similar laws that have been proposed or passed in other states. For example, Virginia, Colorado, Connecticut, and Utah have also passed comprehensive privacy laws that became effective in 2023, and similar** laws have been ~~proposed or~~ passed **or are being considered** in **several** other states, **as well as at the federal and local levels. The evolving patchwork of differing state and federal privacy and data security laws increases the cost and complexity of operating our business and increases our exposure to liability,** including **from third- party litigation** ~~the Virginia Consumer Data Protection Act, which will take effect on January 1, 2023. We will need to invest substantial resources in putting in place policies~~ and ~~procedures to comply~~ **regulatory investigations, enforcement, fines, and penalties. Through our wholly owned subsidiaries** with **established offices in** ~~these~~ -- **the** ~~evolving state laws. As~~ **European Union, parts of** our ~~operations and~~ business **are** ~~grow, we may become~~ subject to ~~or affected by new or additional data protection laws and regulations and face increased scrutiny or attention from regulatory authorities. For example,~~ the European Union General Data Protection Regulation (" GDPR "), which went into effect in May 2018, **and** imposes strict requirements for processing the personal data of individuals within the European Economic Area. Companies that must comply with the GDPR face increased compliance obligations and risk, including more robust regulatory enforcement of data protection requirements and potential fines for noncompliance of up to € 20 million or 4 % of the annual global revenues of the noncompliant company, whichever is greater. Among other requirements, the GDPR regulates transfers of personal data subject to the GDPR to third countries that have not been found to provide adequate protection to such personal data, including the United States ~~, and the efficacy and longevity of current transfer mechanisms between the EU and the United States remains uncertain. For example, in 2016, the EU and United States agreed to a transfer framework for data transferred from the EU to the United States, called the Privacy Shield, but the Privacy Shield was invalidated in July 2020 by the Court of Justice of the European Union~~ . Further, from January 1, 2021, companies **that process the personal information of UK residents** have to comply with ~~the GDPR and also~~ the United Kingdom GDPR (the " UK GDPR "), which, together with the amended UK Data Protection Act 2018, retains the GDPR in UK national law. The UK GDPR mirrors the fines under the GDPR, i. e., fines up to the greater of € 20 million (£ 17. 5 million) or 4 % of global turnover. **Enforcement** ~~The relationship between the United Kingdom and the European Union in relation to certain~~ **uncertainty** ~~aspects of data protection law remains unclear, and it is unclear how United Kingdom data protection laws and regulations will develop in the medium to longer term. On June 28, 2021, the European Commission adopted an~~ **and** ~~adequacy decision in favor of~~ the ~~United Kingdom, enabling data transfers from EU member states to the United Kingdom without additional safeguards. However, the United Kingdom adequacy decision will automatically expire in June 2025 unless the European Commission renews or extends that decision and remains under review by the Commission during this period. These changes may lead to additional~~ costs **associated with ensuring compliance may be onerous** and ~~increase~~ **adversely affect** our ~~overall risk exposure~~ **business, operating results, prospects and financial condition** . Although we work to comply with applicable laws, regulations and standards, contractual obligations and other legal obligations **relating to data privacy, protection and security** , these requirements are evolving and may be modified, interpreted and applied in an inconsistent manner from one jurisdiction to another, and may conflict with one another or other legal obligations with which Ginkgo must comply. ~~Recently~~ **Monitoring** , **preparing for** ~~there has been an~~ **and complying with these obligations requires us to devote significant resources (including, without limitation, financial and time- related resources). And as our operations and business grow, we may become subject to or affected by new or additional data protection laws and regulations and face** ~~increase~~ **increased** ~~in~~ **scrutiny or attention from regulatory authorities. There is also increased** public awareness of privacy issues in the wake of revelations about the data- collection activities of various government agencies and in the number of private privacy- related lawsuits filed against companies. Any failure or perceived failure by us or our employees, representatives, contractors, consultants, collaborators, or other third parties to comply with such requirements or adequately address privacy and security concerns, even if unfounded, could result in additional cost and liability to us, damage our reputation, and adversely affect our business and results of operations. Our employees, agents, contractors, research partners, consultants or vendors may engage in

misconduct or other improper activities, including noncompliance with regulatory standards and requirements. We are exposed to the risk that our employees, agents, contractors, research partners, consultants or vendors may engage in fraudulent or other illegal activity or misconduct. Misconduct by these parties could include intentional, reckless and / or negligent conduct or disclosure of unauthorized activities to us that causes us to breach our contracts and / or violates applicable laws and regulations, including but not limited to laws: • applicable to the provision of health care services; • governing the storage and handling of controlled substances; • requiring the reporting of true, complete and accurate information to the FDA, USDA, and other government agencies; • specifying vendor qualification standards and recordkeeping requirements; • international, federal and state fraud and abuse laws and regulations; • protecting the privacy and security of personally identifiable information and requiring breach notification; • relating to anti- corruption, anti- bribery, and anti- money laundering; and • requiring the true, complete and accurate reporting of services, financial information, or data. Specifically, the health care industry and government contractors are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self- dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, and other business arrangements. Additionally, activities that involve the improper use or misrepresentation of information obtained in the course of research or creating fraudulent data could result in breach of contract, regulatory sanctions, and serious harm to our reputation. It is not always possible to identify and deter misconduct by our employees and other third parties, and the precautions we take to detect and prevent this kind of activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations, other actions, or lawsuits stemming from a failure to be in compliance with such laws or regulations. Additionally, we are subject to the risk that a person could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal health care programs, debarment under 21 U. S. C. § 335a or a comparable foreign law, contractual damages, reputational harm, diminished potential profits and future earnings, and curtailment of our operations, any of which could adversely affect our business, financial condition, results of operations or prospects. Distribution and use of screening and / or diagnostic tests marketed under an EUA from the FDA are subject to certain limitations, and the continued availability of such authorizations is subject to government discretion. Screening and / or diagnostic tests used in the testing programs and services of our **Biosecurity business** ~~affiliated company Concentric by Ginkgo~~ are subject to EUAs granted by the FDA to the manufacturers or laboratories marketing such tests. Each EUA requires compliance with certain conditions, including specific workflow requirements, and imposes other limitations on the test' s marketing, distribution, and use. **The FDA has signaled that, while** ~~We rely on our laboratory and telehealth partners to maintain compliance with the~~ **there will** ~~terms of the applicable EUAs; if they fail to do so we may~~ be **a grace period for EUA holders** ~~in breach of certain customer contracts and may become subject~~ to ~~an~~ **transition their devices, not all of the EUA products we distribute may apply for or be approved by the** FDA ~~enforcement action or experience~~ **and may need to withdraw from** ~~other~~ -- **the market** ~~adverse effects on our business~~. **Sourcing** ~~In some cases we may rely on our telehealth partners to provide physician services as required by the terms~~ and **finding products that transition from** ~~conditions of a COVID- 19 test' s~~ EUA ~~and in order~~ to **FDA cleared status may increase** ~~comply with applicable state laws. If our telehealth partners are unable to or~~ **our** ~~cease providing~~ **costs of sourcing** these **products** ~~physician services for any reason, we may be required to suspend the associated COVID- 19 testing services. Our business, prospects and results of operations may be materially harmed if we are required to suspend the provision of any COVID- 19 testing services in order to meet EUA requirements due to an~~ **and may impact** ~~issue with a vendor or~~ **our profitability** ~~for any other reason~~. We have pursued in the past and may pursue additional U. S. ~~Government~~ **government** contracting and subcontracting opportunities in the future and as a U. S. ~~Government~~ **government** prime contractor and subcontractor, we are subject to a number of procurement rules and regulations. We have entered into agreements with governmental entities and contractors in the past to serve as a U. S. government prime contractor or subcontractor and may do so again in the future. U. S. government procurement contractors and subcontractors must comply with specific procurement regulations and other requirements. These requirements, although customary in U. S. government contracts, could impact our performance and compliance costs, including by limiting or delaying our ability to share information with business partners, customers and investors. The U. S. government has in the past and may in the future demand contract terms that are less favorable than standard arrangements with private sector customers and may have statutory, contractual, or other legal rights to terminate contracts with us for convenience or for other reasons. Generally, U. S. government contracts contain provisions permitting unilateral termination or modification, in whole or in part, at the government' s convenience. Under general principles of government contracting law, if the government terminates a contract for convenience, the government contractor may recover only its incurred or committed costs, settlement expenses and profit on work completed prior to the termination. If the government terminates a contract for default, the government contractor is entitled to recover costs incurred and associated profits on accepted items only and may be liable for excess costs incurred by the government in procuring undelivered items from another source. Any termination for default may also adversely affect our ability to contract with other government customers and agencies, as well as our reputation, business, financial condition and results of operations. In addition, changes in U. S. government budgetary priorities could lead to changes in the procurement environment, affecting availability of U. S. government contracting, subcontracting or funding opportunities, which could lead to modification, reduction or termination of our U. S. government contracts or subcontracts. If and to the extent such changes occur, they could impact our results and potential growth opportunities. Furthermore, our U. S. government contracts grant the government the right to use technologies developed by us under the government contract or the right to share data related to our technologies, for or on behalf of the government. Under our government contracts, we may not be able to limit third parties, including our competitors, from accessing certain of these technology or data rights, including intellectual property, in providing products and services to the

government. In addition, failure by us, our employees, representatives, contractors, partners, agents, intermediaries, other customers or other third parties to comply with these regulations and requirements could result in reductions of the value of contracts, contract modifications or termination, claims for damages, refund obligations, the assessment of civil or criminal penalties and fines, loss of rights in our intellectual property and temporary suspension or permanent debarment from government contracting, all of which could negatively impact our results of operations and financial condition. Any such damages, penalties, disruptions or limitations in our ability to do business with the public sector could result in reduced sales of our products, reputational damage, penalties and other sanctions, any of which could harm our business, reputation and results of operations. We are engaged in certain research activities involving controlled substances, including cannabinoids and other chemical intermediates, the making, use, sale, importation, exportation, and distribution of which may be subject to significant regulation by the DEA, FDA, and other regulatory agencies. We are engaged in certain research activities involving the development of microbes designed to generate cannabinoids, their precursors and other chemical intermediaries, some of which may be regulated as controlled substances in the United States. Controlled substances are subject to state, federal, and foreign laws and regulations regarding their manufacture, use, sale, importation, exportation, and distribution. Among other laws, controlled substances are regulated under the federal Controlled Substances Act of 1970 and implementing regulations of the DEA. The DEA regulates controlled substances as Schedule I, II, III, IV or V substances. Schedule I substances by definition have no established medicinal use and may generally not be marketed or sold in the United States. Schedule I substances are subject to the most stringent controls and Schedule V the least controls of the five schedules, based on their relative risk of abuse. Cannabinoids are naturally occurring compounds found in the cannabis plant. The cannabis plant and its derivatives are highly regulated by the DEA and the USDA. Specifically, marihuana, which is defined as all parts of the plant Cannabis sativa L., whether growing or not, the seeds thereof, the resin extracted therefrom, and every compound, manufacture, salt, derivative, mixture, or preparation, is classified as a Schedule I controlled substance. However, the term does not include " hemp, " which means the cannabis plant and any part of that plant, including the seeds and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a delta- 9 tetrahydrocannabinol (" THC ") concentration of not more than 0. 3 % on a dry weight basis. Thus, depending on the THC concentration of the product, the product may or may not be regulated as a controlled substance. The DEA has historically regulated synthetic cannabinoids similarly to naturally- derived cannabinoids. Consequently, even though our cannabinoids that could be produced from microbes may not be derived from the cannabis plant, the DEA may consider them to be controlled substances subject to stringent regulatory controls. Regulations associated with controlled substances govern manufacturing, labeling, packaging, testing, dispensing, production and procurement quotas, recordkeeping, reporting, handling, shipment and disposal. These regulations include required security measures, such as background checks on employees and physical control of inventory and increase the personnel needs and the expense associated with development and commercialization of products or product candidates including controlled substances. Regulators conduct periodic inspections of entities involved in handling, manufacturing, or otherwise distributing controlled substances, and have broad enforcement authorities. If we are found to be non- compliant with applicable controlled substance registrations and related requirements, we may need to modify its business activities and / or stop handling or producing the products regulated as controlled substances, and could be subject to enforcement action, significant fines or penalties, and / or adverse publicity, among other consequences. Various states also independently regulate controlled substances. Though state-controlled substances laws often mirror federal law, because the states are separate jurisdictions, they may separately schedule substances, as well. The failure to comply with applicable regulatory requirements could lead to enforcement actions and sanctions from the states in addition to those from the DEA or otherwise arising under federal law. Changes in government regulations may materially and adversely affect our sales and results of operations. The markets where we provide our services are heavily influenced by foreign, federal, state and local government regulations and policies. The U. S. or foreign governments may take administrative, legislative, or regulatory action that could materially interfere with our customer' s ability to sell products derived from engineered cells in certain countries and / or to certain customers. The uncertainty regarding future standards and policies may also affect our ability to develop our programs or to license engineered cells to customers and to initiate new programs with our customers, which could have a material adverse effect on our business, financial condition and results of operations. Changes in U. S. trade policy more generally could trigger retaliatory actions by affected countries, which could impose restrictions on our ability to do business in or with affected countries or prohibit, reduce or discourage purchases of our services by foreign customers, leading to increased program costs, increased costs of developing or manufacturing our customers' products and higher prices for their products in foreign markets. Changes in, and responses to, U. S. trade policy could reduce the competitiveness of our services or our customers' products, cause our services to be less in demand and our sales to decline and adversely impact our ability to compete, which could materially and adversely impact our business, financial condition and results of operations. We are subject to certain U. S. and foreign anti- corruption, anti- bribery and anti- money laundering laws and regulations. We can face serious consequences for violations. We are subject to the U. S. Foreign Corrupt Practices Act of 1977, as amended (the " FCPA "), the U. S. domestic bribery statute contained in 18 U. S. C. § 201, the U. S. Travel Act, the U. K. Bribery Act and possibly other anti- corruption, anti- bribery and anti- money laundering laws and regulations in the jurisdictions in which we do business, both domestic and abroad. Anti- corruption and anti- bribery laws have been enforced aggressively in recent years. The FCPA and other anti- corruption laws generally prohibit companies, their employees, agents, representatives, business partners and third- party intermediaries from corruptly promising, authorizing, offering, or providing, directly or indirectly, anything of value to government officials, political parties, or candidates for public office for the purpose of obtaining or retaining business or securing an improper business advantage. The UK Bribery Act and other anti- corruption laws also prohibit commercial bribery not involving government officials, and requesting or accepting bribes; and anti- money laundering laws prohibit engaging in certain transactions involving criminally- derived property or the proceeds of criminal activity. We and our third- party business partners, representatives and agents may have direct or indirect

interactions with officials and employees of government agencies or state- owned or- affiliated universities or other entities (for example, to obtain necessary permits, licenses, patent registrations and other regulatory approvals), which increases our risks under the FCPA and other anti- corruption laws. We also engage contractors, consultants and other third parties from time to time to conduct business development activities abroad. We may be held liable for the corrupt or other illegal activities of our employees or third parties even if we do not explicitly authorize such activities. We have increased and, in the future, expect our non- U. S. activities to increase over time, which may also increase our exposure under these laws. The FCPA also requires that we keep accurate books and records and maintain a system of adequate internal controls. While we have controls to address compliance with such laws and will continue to review and enhance our compliance program, we cannot assure you that our employees, agents, representatives, business partners or third- party intermediaries will always comply with our policies and applicable law, for which we may be ultimately held responsible. Any allegations or violation of the FCPA or other applicable anti- bribery, anti- corruption laws and anti- money laundering laws may result in whistleblower complaints, sanctions, settlements, investigations, prosecution, enforcement actions, substantial criminal fines and civil penalties, disgorgement of profits, imprisonment, debarment, tax reassessments, breach of contract and fraud litigation, loss of export privileges, suspension or debarment from U. S. government contracts, adverse media coverage, reputational harm and other consequences, all of which may have an adverse effect on our reputation, business, financial condition, results of operations and prospects. Responding to an investigation or action can also result in a materially significant diversion of management' s attention and resources and significant defense costs and other professional fees. Significant disruptions to our and our service providers' information technology systems or data security incidents could result in significant financial, legal, regulatory, business and reputational harm to us. We are increasingly dependent on information technology systems and infrastructure, including services licensed, leased or purchased from third parties such as cloud computing infrastructure and operating systems, to operate ~~its~~ **our** business. In the ordinary course of business, we collect, store, process and transmit large amounts of sensitive information, including intellectual property, proprietary business information, personal information and other confidential information. It is critical that we do so in a secure manner to maintain the confidentiality, integrity and availability of such sensitive information. We have also outsourced elements of our operations (including elements of ~~its~~ **our** information technology infrastructure) to third parties, and as a result, we manage a number of third- party vendors who may have access to our networks or our confidential information. While we take measures to safeguard and protect this information, threats to network and data security are ~~increasingly diverse~~ **constantly evolving** and **growing in frequency and** ~~sophisticated~~ **sophistication** . We may also face increased cybersecurity risks due to our reliance on internet technology and the number of our employees working remotely, which may create additional opportunities for cybercriminals to exploit vulnerabilities. ~~Despite our~~ **We are required to expend significant resources in an** ~~efforts~~ **effort to protect against security incidents** , ~~training~~ **and may be required or choose to spend additional resources or modify our business activities, particularly where required by applicable data privacy and security laws or regulations or industry standards. Security incidents result from the actions of a wide variety of actors with a wide range of motives and expertise, such as traditional hackers, personnel or the personnel of third parties, sophisticated nation- states and nation- state- supported actors. While we have developed systems** and processes **designed** to **protect the integrity, confidentiality and security of the confidential and personal information under our control, we cannot guarantee that any security measures that we or our third- party service providers implement will be effective in** ~~prevent~~ **preventing** security breaches and incidents, ~~our information technology systems, servers, and those of third parties that we use in our operations are vulnerable to cybersecurity risks, including~~ cyberattacks **or similar events** such as viruses and worms, phishing attacks and other forms of social engineering, denial- of- service attacks, ransomware attacks, physical or electronic break- ins, third- party or employee theft or misuse, and other negligent actions, errors or malfeasance by employees or other third parties, and similar disruptions from unauthorized tampering with ~~its~~ **our** servers and computer systems or those of third parties that we use in ~~its~~ **our** operations ~~, which~~ **. These incidents** could lead to interruptions, delays, loss or corruption of critical data, **and** unauthorized access to or acquisition of health- related and other personal information. In addition, we may be the target of email scams and other social engineering attacks that attempt to acquire personal information or company assets or access to our systems **. Additionally, future or past business transactions (such as acquisitions or integrations) could expose us to additional cybersecurity risks and vulnerabilities, as our systems could be negatively affected by vulnerabilities present in acquired or integrated entities' systems and technologies** . Despite our efforts to create security barriers to such threats, we may not be able to entirely mitigate these risks. Our third- party service providers face similar risks. Any cyberattack that attempts to obtain our data or assets, including data that we maintain on behalf of ~~its~~ **our** customers, disrupt ~~its~~ **our** service, or otherwise access ~~its~~ **our** systems, or those of third parties we use, or any other security breach or incident, could adversely affect our business, financial condition and operating results, be expensive to remedy, and damage our reputation. We and our third- party service providers may **be unable to anticipate or detect attempted security incidents or** face difficulties or delays in identifying or otherwise responding to any attacks or actual or potential security breaches or security incidents. We may incur significant costs and operational consequences of investigating, remediating, eliminating and putting in place additional tools and devices designed to prevent actual or perceived security breaches and other security incidents, including in response to any actual or perceived incident we may suffer, and substantial costs to comply with any notification or other legal obligations resulting from any security breaches or other security incidents. In addition, any such breaches or incidents, or the perception that they have occurred, may result in **substantial remediation costs and expose us to litigation (including class claims), regulatory enforcement action (for example, investigations, fines, penalties, audits, and inspections), liability under laws that protect the privacy of personal information, additional reporting requirements and / or oversight, indemnification obligations,** negative publicity, **reputational harm,** and **interruptions in our operations (including availability of data), any of which** could have ~~an~~ **a material** adverse effect on our business, financial condition, and operating results. Although we maintain insurance coverage that may cover certain liabilities in connection with security

breaches and other security incidents, we cannot be certain our insurance coverage will be adequate for liabilities actually incurred, that insurance will continue to be available to us on commercially reasonable terms (if at all) or that any insurer will not deny coverage as to any future claim. Governmental trade controls, including export and import controls, sanctions, customs requirements and related regimes, could subject us to liability or loss of contracting privileges or limit our ability to compete in certain markets. Our programs and technologies are subject to U. S. and non- U. S. export controls. Export authorizations may be required for biotechnology products, technologies, or services to be exported outside of the United States, to a foreign person, or outside of a foreign jurisdiction. Our current or future programs or technologies are, and may in the future, be subject to the Export Administration Regulations (" EAR "). If a program, technology, or service meets certain criteria for control under the EAR, then that engineered cell, production process, resulting product, technology, or service would be exportable outside the United States or to a foreign person or from one foreign jurisdiction to another foreign jurisdiction only if we obtain the applicable export license or other applicable authorization including qualifying for a license exception, if required. Compliance with the U. S. and foreign export laws and regulations and other applicable regulatory requirements regarding the sales, shipment and use of our engineering cells, bioprocesses and other technology may affect our ability to work with foreign partners, affect the speed at which we can introduce new products into non- U. S. markets, or limit our ability to sell programs or services or license technologies into some countries. Additionally, certain materials that we use in our programs are subject to U. S. import controls. We currently have, and may in the course of business need to procure, certain import authorizations, for example, related to plant pests, chemicals, biological agents and other controlled materials, including from the USDA, EPA and CDC. Compliance with applicable regulatory requirements regarding the import of such materials may limit our access to materials critical to our development activities or affect the speed at which we can advance new programs. Our activities are also subject to the economic sanctions laws and regulations of the United States and other jurisdictions. Such controls prohibit certain transactions, potentially including financial transactions and the transfer of products, technologies and services, to sanctioned countries, governments and persons, without a license or other appropriate authorization. U. S. sanctions policy changes could affect our or our customers' ability to interact, directly and indirectly, with targeted companies or companies in sanctioned countries. While we take precautions to comply with U. S. and non- U. S. export control, import control and economic sanctions laws and regulations, we cannot guarantee that such precautions will prevent violations of such laws, including transfers to unauthorized persons or destinations, and including inadvertent violations as a result of a misclassification of a product, technology or service under export control laws. Violations could result in our business being subject to government investigations, denial of export or import privileges, significant fines or penalties, denial of government contracts and reputational harm. Any limitation on our ability to export our engineered cells, production processes, resulting products, technology, or services, or import materials critical to our programs would likely adversely affect our business and financial condition. Changes in U. S. and foreign tax laws could have a material adverse effect on our business, cash flow, results of operations or financial condition. We are subject to income and non- income based taxes in the U. S. and foreign jurisdictions. Changes in tax laws, regulations and policies, or their interpretation and application, in the jurisdictions where we are subject to tax, could have a material adverse effect on our business, cash flow, results of operations or financial condition. The U. S. Congress frequently debates changes to U. S. corporate income tax laws and the Group of Twenty (G20), the Organization for Economic Co- operation and Development (OECD), the European Commission (EC) and individual taxing jurisdictions have published proposals covering various international tax- related issues, including country- by- country reporting, permanent establishment rules, transfer pricing and tax treaties. It is possible that any future tax legislation which may be enacted could materially impact our effective tax rate and cash tax liability as well as tax credits and incentives. We may become subject to lawsuits or indemnity claims in the ordinary course of business, which could materially and adversely affect our business and results of operations. From time to time, we may in the ordinary course of business be named as a defendant in lawsuits, indemnity claims and other legal proceedings. These actions may seek, among other things, compensation for alleged product liability, personal injury, employment discrimination, breach of contract, property damage and other losses or injunctive or declaratory relief. The marketing, sale and use of our services engineered cells, production processes and resulting products could lead to the filing of product liability claims were someone to allege that our services, engineered cells, production processes or resulting products failed to perform as designed or intended or caused injury or other harms. A product liability claim could result in substantial damages and be costly and time- consuming for us to defend. Regardless of merit or eventual outcome, product liability claims may result in: ●–● decreased demand for programs and resulting products; ●–● loss of revenue; ●–● substantial monetary payments; ●–● significant time and costs to defend related litigation; ●–● the inability to commercialize any products from our programs; and ●–● injury to our reputation and significant negative media attention. In the event that such actions, claims or proceedings are ultimately resolved unfavorably to us at amounts exceeding our accrued liability, or at material amounts, the outcome could materially and adversely affect our business and results of operations. In addition, payments of significant amounts, even if reserved, could adversely affect our liquidity position. We maintain product liability insurance, but this insurance may not fully protect us from the financial impact of defending against product liability claims. Any product liability claim brought against us, with or without merit, could increase our insurance rates or prevent us from securing insurance coverage in the future. Additionally, any product liability lawsuit could cause current collaborators to terminate existing agreements or potential collaborators to seek other companies, any of which could impact our business and results of operations. ~~Zymergen is a party to a mitigation agreement with the Committee on Foreign Investment in the United States (" CFIUS ") and can face penalties or further restrictions if it fails to comply with that agreement. When we acquired Zymergen, Zymergen was subject to a preexisting agreement with CFIUS relating to an investor in Zymergen (who, following the Zymergen Acquisition, became a Ginkgo shareholder). This agreement requires Zymergen to adhere to certain information and technology protection requirements. This agreement will remain in place until the parties to the agreement agree to terminate it. Zymergen has incurred incremental additional costs in implementing and complying with the agreement, and~~

~~because the agreement will remain in place, we will continue to incur costs following the Zymergen acquisition, and ensure compliance to avoid any penalties, injunctive action, additional mitigation conditions or other restrictions.~~ Risks Related to our Common Stock, Organizational Structure and Governance ~~We are not, and do not intend to become, regulated as an " investment company " under the Investment Company Act, and if we were deemed an " investment company " under the Investment Company Act, applicable restrictions could make it impractical for us to continue our business as contemplated and could have a material adverse effect on our business. An entity generally will be deemed to be an " investment company " for purposes of the Investment Company Act if: ● it is an " orthodox " investment company because it is or holds itself out as being engaged primarily, or proposes to engage primarily, in the business of investing, reinvesting or trading in securities; or ● it is an inadvertent investment company because, absent an applicable exemption, (i) it owns or proposes to acquire investment securities having a value exceeding 40 % of the value of its total assets (exclusive of U. S. government securities and cash items) on an unconsolidated basis, or (ii) it owns or proposes to acquire investment securities having a value exceeding 45 % of the value of its total assets (exclusive of U. S. government securities and cash items) and / or more than 45 % of its income is derived from investment securities on a consolidated basis with its wholly owned subsidiaries. We believe that we are engaged primarily in the business of providing cell engineering services to customers from across a variety of industries and not in the business of investing, reinvesting or trading in securities. We hold ourselves out as a synthetic biology company and do not propose to engage primarily in the business of investing, reinvesting or trading in securities. Accordingly, we do not believe that we are an " orthodox " investment company as defined in Section 3 (a) (1) (A) of the Investment Company Act of 1940, as amended (the " Investment Company Act ") and described in the first bullet point above. Furthermore, we believe that less than 40 % of our total assets (exclusive of U. S. government securities and cash items) on an unconsolidated basis will be composed of assets that could be considered investment securities. Accordingly, we do not believe that we are an inadvertent investment company by virtue of the 40 % tests in Section 3 (a) (1) (C) of the Investment Company Act as described in the second bullet point above. In addition, we believe that we are not an investment company under Section 3 (b) (1) of the Investment Company Act because we are primarily engaged in a non- investment company business. The Investment Company Act and the rules thereunder contain detailed parameters for the organization and operation of investment companies. Among other things, the Investment Company Act and the rules thereunder limit or prohibit transactions with affiliates, impose limitations on the issuance of debt and equity securities, generally prohibit the issuance of options and impose certain governance requirements. We intend to conduct our operations so that we will not be deemed to be an investment company under the Investment Company Act or otherwise conduct our business in a manner that does not subject us to the registration and other requirements of the Investment Company Act. In order to ensure that we are not deemed to be an investment company, we may be limited in the assets that we may continue to own and, further, may need to dispose of or acquire certain assets at such times or on such terms as may be less favorable to us than in the absence of such requirement. If anything were to happen which would cause us to be deemed to be an investment company under the Investment Company Act (such as significant changes in the value of our programs or a change in circumstance that results in a reclassification of our interests in our programs for purposes of the Investment Company Act), the requirements imposed by the Investment Company Act could make it impractical for us to continue our business as currently conducted, which would materially adversely affect our business, financial condition and results of operations. In addition, if we were to become inadvertently subject to the Investment Company Act, any violation of the Investment Company Act could subject us to material adverse consequences, including potentially significant regulatory penalties and the possibility that certain of our contracts could be deemed unenforceable.~~ Only our employees and directors are entitled to hold shares of Class B common stock (including shares of Class B common stock granted or otherwise issued to our employees and directors in the future), which shares have ten votes per share. This limits or precludes other stockholders' ability to influence the outcome of matters submitted to stockholders for approval, including the election of directors, the approval of certain employee compensation plans, the adoption of certain amendments to our organizational documents and the approval of any merger, consolidation, sale of all or substantially all of our assets, or other major corporate transaction requiring stockholder approval. Shares of our Class B common stock have ten votes per share, whereas shares of our Class A common stock have one vote per share and shares of our Class C common stock have no voting rights (except as otherwise expressly provided in our amended and restated certificate of incorporation (the " Charter ") or required by applicable law). As of December 31, ~~2022~~ **2023** , our directors and executive officers hold in the aggregate **almost half** ~~approximately 47. 4 %~~ of the total voting power of our outstanding capital stock, and our directors, founders and executive officers hold in the aggregate **more than half** ~~approximately 66. 1 %~~ of the total voting power of our outstanding capital stock. Accordingly, holders of shares of Class B common stock are able to significantly influence the outcome of matters submitted to our stockholders for approval, including the election of directors, the approval of certain employee compensation plans, the adoption of amendments to our organizational documents and the approval of any merger, consolidation, sale of all or substantially all of our assets or other major corporate transaction requiring stockholder approval. This concentrated voting power limits or precludes other stockholders' ability to influence the outcome of these matters. Holders of Class B common stock may have interests that differ from holders of Class A common stock and may vote in a way with which holders of Class A common stock disagree and which may be adverse to the interests of holders of Class A common stock. This concentrated voting power is likely to have the effect of limiting the likelihood of an unsolicited merger proposal, unsolicited tender offer or proxy contest for the removal of directors. As a result, our governance structure and Charter may have the effect of depriving our stockholders of an opportunity to sell their shares at a premium over prevailing market prices and make it more difficult to replace our directors and management. Furthermore, this concentrated voting power could discourage a potential investor from acquiring Class A common stock due to the limited voting power of such stock relative to Class B common stock, which could also adversely affect the trading price of Class A common stock. Our multi- class stock structure is intended to preserve our existing founder- led governance structure, to promote employee retention and engagement, to facilitate continued innovation and the risk- taking

that it requires, to permit us to continue to prioritize our long- term goals rather than short- term results, to enhance the likelihood of continued stability in the composition of our board of directors and its policies, and to discourage certain types of transactions that may involve an actual or threatened acquisition of the company, all of which we believe are essential to the long- term success of our company and to long- term stockholder value. We expect to maintain this concentrated voting power among our founders and employees for the foreseeable future, including by issuing additional shares of Class B common stock to our employees pursuant to our equity compensation plans and allowing our employees and directors to exchange shares of Class A common stock for shares of Class B common stock. Future transfers of shares of Class B common stock to persons other than Ginkgo directors and employees, or trusts or legal entities through which the right to vote the shares of Class B common stock held thereby is exercised exclusively by one or more of Ginkgo' s directors or employees (any such director, employee, trust or legal entity, an " Eligible Holder "), or the holder of shares of Class B common stock ceasing to be an Eligible Holder, will generally result in those shares converting to shares of Class A common stock on a one- to- one basis, subject to certain exceptions and unless a majority of the independent directors of our board of directors determine that such transfer or event will not result in such automatic conversion. Each share of Class B common stock is also convertible at any time at the option of the holder into one share of Class A common stock. The conversion of Class B common stock to Class A common stock over time will have the effect of increasing the relative voting power of those holders of Class B common stock who retain their shares of Class B common stock in the long term. As a result, the relative voting power of holders of Class A common stock is expected to remain limited for a significant period of time, and it is possible that one or more of the persons or entities holding Class B common stock could gain significant voting control as other holders of Class B common stock sell or otherwise convert their shares into Class A common stock. In addition, the conversion of Class B common stock to Class A common stock would dilute holders of Class A common stock in terms of voting power within the Class A common stock. Because holders of Class C common stock have no voting rights (except as otherwise expressly provided in the Charter or required by applicable law), the holders of Class B common stock may be able to significantly influence the outcome of matters submitted to our stockholders for approval for a longer period of time than would be the case if we issued Class A common stock rather than Class C common stock in such transactions. Our share price may change significantly over time, and you may not be able to resell our common stock at or above the price you paid or at all, and you could lose all or part of your investment as a result. The trading price of our Class A common stock has been in the past and is likely to continue to be volatile. Such volatility may be, in part, attributable to: ● future sales of our common stock or other securities by us or our existing stockholders, or the perception of such future sales; ● results of operations of the company or our competitors that vary from the expectations of securities analysts and investors; ● changes in expectations as to our future financial performance and growth, including assessments of our business, prospects, financial estimates and investment recommendations by securities analysts, investors and short sellers; ● additions or departures of key management personnel or members of our board of directors; ● announcements by us or our competitors of significant contracts, new products, acquisitions, joint marketing relationships, joint ventures, other strategic relationships or capital commitments; ● announcements relating to actual or potential civil and non- civil litigation, as well as governmental or regulatory investigations or inquiries; ● guidance that we provide to the public, any changes in this guidance or our failure to meet this guidance; ● changes in the perception of our offerings or the synthetic biology industry more general including changes in regulatory conditions; ● the development and sustainability of an active trading market for our common stock; ● changes in accounting principles; ● changes in general economic or market conditions or trends in our industry or markets; ● other events or factors, including those resulting from natural disasters, pandemics, epidemics, war ~~(including Russia' s invasion of Ukraine)~~, acts of terrorism or responses to these events. These factors among others may materially adversely affect the market price of our Class A common stock, regardless of our actual operating performance. In addition, price volatility may be greater if the public float and trading volume of our common stock are low. In the past, following periods of market volatility, stockholders have instituted securities class action litigation. If we were involved in securities litigation, it could have a substantial cost and divert resources and the attention of executive management from our business regardless of the outcome of such litigation. Future sales, or the perception of future sales, by us or our stockholders in the public market could cause the market price for our securities to decline. The sale of our securities in the public market, including by entities to which we have issued shares in connection with transactions, or the perception that such sales could occur, could harm the prevailing market price of our securities. These sales, or the possibility that these sales may occur, also might make it more difficult for us to sell equity securities in the future at a time and at a price that we deem appropriate. There are up to approximately 206 million shares of common stock that may be earned if the trading price is greater than or equal to certain earnout price thresholds ranging from $ 12. 50 to $ 20. 00 for any point in a trading day during 20 trading days in a 30 consecutive trading day period, of which approximately 51. 5 million shares were earned as of December 31, ~~2022~~ **2023**. The vast majority of the shares that are part of the earnout will not be subject to lock- up once the earnout conditions are met. In connection with the SRNG Business Combination, in September 2021, Jason Kelly, Reshma Shetty, Austin Che and Bartholomew Canton were granted restricted stock units, which vested, along with certain related earnout shares that achieved the $ 12. 50 price threshold, on October 1, 2022. Certain of such shares have been sold into the market ~~(including to cover the income tax obligations associated with their vesting and distribution or otherwise)~~, ~~and such sales~~ and any future sales could harm the prevailing market price of our securities. We have also issued shares of our common stock in connection with certain of our acquisitions, which issuances dilute our existing shareholders. In addition, the shares of our common stock reserved for future issuance under our equity incentive plans will become eligible for sale in the public market once those shares are issued, subject to provisions relating to various vesting agreements and, in some cases, limitations on volume and manner of sale applicable to affiliates under Rule 144, as applicable. Our compensation committee of our board of directors may determine the exact number of shares to be reserved for future issuance under our equity incentive plans at its discretion. We have filed, and expect to file in the future, one or more registration statements on Form S- 8 under the Securities Act to register shares of Class

A common stock or securities convertible into or exchangeable for shares of Class A common stock issued pursuant to our equity incentive plans. Any such Form S- 8 registration statements automatically become effective upon filing. Accordingly, shares registered under such registration statements will be available for sale in the open market. Short sellers may engage in manipulative activity intended to drive down the market price of our Class A common stock, which could also result in related regulatory and governmental scrutiny, among other effects. Short selling is the practice of selling securities that the seller does not own but rather has borrowed or intends to borrow from a third party with the intention of later buying lower priced identical securities to return to the lender. Accordingly, it is in the interest of a short seller of our Class A common stock for the price to decline. At any time, short sellers may publish, or arrange for the publication of, opinions or characterizations that are intended to create negative market momentum. Issuers, like us, whose securities have historically had limited trading history or volumes and / or have been susceptible to relatively high volatility levels can be vulnerable to such short seller attacks. Short selling reports can cause increased volatility in an issuer' s stock price, and result in regulatory and governmental inquiries. On October 6, 2021, such a report was published about us. Shortly after, we received a preliminary and informal inquiry from the U. S. Department of Justice related to this report. Any related inquiry or formal investigation from a governmental organization or other regulatory body, including any inquiry from the SEC, is not within the control of the Company. Although we have received confirmation from the SEC that it concluded its inquiry into Ginkgo Bioworks Holdings, Inc. begun in October 2021 or soon after with no recommendation of enforcement action, any inquiry or formal investigation by any governmental organization or regulatory body could result in a material diversion of our management' s time and could have a material adverse effect on our business and results of operations. Our Charter authorizes a large number of shares of Class B common stock for issuance in the future. The future issuance of shares of Class B common stock may have the effect of further concentrating voting power with our employees and other Class B stockholders, and could have an adverse effect on the trading price of Class A common stock. Under our Charter, we are authorized to issue 4, 500 **. 0 million** ~~, 000, 000~~ shares of Class B common stock, which are entitled to ten votes per share. We currently intend to issue additional shares of Class B common stock in the future to existing and newly hired employees pursuant to our equity compensation plans. Our authorized but unissued shares of Class B common stock are available for issuance to Eligible Holders with the approval of our board of directors without stockholder approval, except as may be required by the Listing Rules of the NYSE. In addition, our authorized but unissued shares of Class B common stock are available for issuance to persons other than Eligible Holders only with the approval of a majority of our directors elected by the holders of Class B common stock, voting separately as a class. If we issue additional shares of Class B common stock in the future, holders of shares of Class A common stock, which are entitled to one vote per share, will experience disproportionate voting power dilution relative to economic dilution, and the holders of Class B common stock may be able to significantly influence the outcome of matters submitted to our stockholders for approval for a longer period of time than would be the case if we issued shares of Class A common stock. See " Risk Factors — Risks Related to Our **Common Stock** Organizational Structure and Governance — Only our employees and directors are entitled to hold shares of Class B common stock (including shares of Class B common stock granted or otherwise issued to our employees and directors in the future), which shares have ten votes per share. This limits or precludes other stockholders' ability to influence the outcome of matters submitted to stockholders for approval, including the election of directors, the approval of certain employee compensation plans, the adoption of amendments to our organizational documents and the approval of any merger, consolidation, sale of all or substantially all of our assets or other major corporate transaction requiring stockholder approval. " Under our Charter, we are authorized to issue 800 **. 0 million** ~~, 000, 000~~ shares of Class C common stock, which have no voting rights (except as otherwise expressly provided in the Charter or required by applicable law). Outstanding Class C common stock may have the effect of extending voting power in Class B common stock, and may discourage potential acquisitions of our business and could have an adverse effect on the trading price of Class A common stock. Under our Charter, we are authorized to issue 800 **. 0 million** ~~, 000, 000~~ shares of Class C common stock, which have no voting rights (except as required by law). Class C common stock may be used for a variety of corporate purposes, including financings, acquisitions and investments. Our authorized but unissued shares of Class C common stock are available for issuance with the approval of our board of directors without stockholder approval, except as may be required by the Listing Rules of the NYSE. Because the Class C common stock carries no voting rights (except as otherwise expressly provided in the Charter or required by applicable law), is not convertible into any other capital stock, and is not listed for trading on an exchange or registered for sale with the SEC, shares of Class C common stock may be less liquid and less attractive to any future recipients of these shares than shares of Class A common stock, although we may seek to list the Class C common stock for trading and register shares of Class C common stock for sale in the future. In addition, because our Class C common stock has no voting rights (except as otherwise expressly provided in the Charter or required by applicable law), the holders of Class B common stock may be able to significantly influence the outcome of matters submitted to our stockholders for approval for a longer period of time than would be the case if we issued Class A common stock rather than Class C common stock in such transactions. In addition, further issuances of Class C common stock would have a dilutive effect on the economic interests of Class A common stock and Class B common stock. Any such issuance could also cause the trading price of Class A common stock to decline. We cannot predict the effect the multi- class structure of our common stock may have on the trading price of our Class A common stock. The holding of low- voting stock, such as Class A common stock, may not be permitted by the investment policies of certain institutional investors or may be less attractive to the portfolio managers of certain institutional investors. In addition, certain index providers have announced restrictions on including companies with multiple- class share structures in certain of their indices. ~~In July 2017, S & P Dow Jones announced that they would cease to allow most newly public companies with dual- or multi- class capital structures to be included in their indices. Affected indices include the S & P 500, S & P MidCap 400 and S & P SmallCap 600, which together make up the S & P Composite 1500. Under the announced policies, our multi- class capital structure would make our Class A common stock ineligible for inclusion in certain indices, and as a result, mutual funds, exchange- traded funds and other investment vehicles~~

~~that attempt to passively track those indices would not invest in our common stock. These policies may depress our valuation compared to those of other similar companies that are included.~~ Because of our multi- class stock structure, our Class A common stock will likely continue to be excluded from certain ~~of these~~ indices, and we cannot assure you that other stock indices will not take similar actions. Given the sustained flow of investment funds into passive strategies that seek to track certain indices, exclusion from stock indices would likely preclude investment by many of these funds in our Class A common stock and could make shares of our Class A common stock less attractive to other investors. As a result, the trading price of shares of our Class A common stock could be adversely affected. Our focus on the long- term best interests of our company and our consideration of all of our stakeholders, including our stockholders, workforce, customers, suppliers, academic researchers, governments, communities and other stakeholders that we may identify from time to time, may conflict with short- term or medium- term financial interests and business performance, which may adversely impact the value of our common stock. We believe that focusing on the long- term best interests of our company and our consideration of all of our stakeholders, including our stockholders, workforce, customers, suppliers, academic researchers, governments, communities and other stakeholders we may identify from time to time, is essential to the long- term success of our company and to long- term stockholder value. Therefore, we have made decisions, and may in the future make decisions, that we believe are in the long- term best interests of our company and our stockholders, even if such decisions may negatively impact the short- or medium- term performance of our business, results of operations, and financial condition or the short- or medium- term performance of our Class A common stock. Our commitment to pursuing long- term value for the company and its stockholders, potentially at the expense of short- or medium- term performance, may materially adversely affect the trading price of our Class A common stock, including by making owning our Class A common stock less appealing to investors who are focused on returns over a shorter time horizon. Our decisions and actions in pursuit of long- term success and long- term stockholder value, which may include our multi- class stock structure, making investments in R & D and our employees, and investing in and introducing new products and services, may not result in the long- term benefits that we expect, in which case our business, results of operations and financial condition, as well as the trading price of our Class A common stock, could be materially adversely affected.