**Risk Factors Comparison 2024-03-06 to 2023-03-01 Form: 10-K**

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You should carefully consider the following factors regarding information included in this Annual Report. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations. If any of the following risks actually occur, our business, financial condition and operating results could be materially adversely affected. Risks Related to Our Financial Position and Need for Additional Capital We have incurred significant losses in recent years, expect to incur significant net losses in the foreseeable future and may never become profitable. We have experienced significant operating losses over the last several years. As of December 31, ~~2022~~ **2023** our accumulated deficit was $ 1. ~~5~~ **6** billion. We have generated limited revenues, primarily consisting of license revenue, grant funding and interest income. We expect to continue to incur substantial additional operating losses for at least the next several years as we advance our clinical trials and research and development activities. We may never successfully commercialize our DNA medicine candidates or proprietary ~~smart~~ device technology and thus may never have any significant future revenues or achieve and sustain profitability. We have limited sources of revenue and our success is dependent on our ability to develop our DNA medicines and proprietary ~~smart~~ device technology. We do not ~~sell~~ **currently generate** any **revenue from the commercial sale of** products ~~and may not have any other products commercially available for several years, if at all~~. Our ability to generate future revenues depends heavily on our success in: • developing and securing United States and / or foreign regulatory approvals for our DNA medicine candidates, including securing regulatory approval for conducting clinical trials with DNA medicine candidates; • developing our proprietary ~~smart~~ device technology; and • commercializing any products for which we receive approval from the FDA and foreign regulatory authorities. Our proprietary ~~smart~~ device and DNA medicine candidates will require extensive additional clinical study and evaluation, regulatory approval in multiple jurisdictions, substantial investment and significant marketing efforts before we generate any revenues from product sales. We are not permitted to market or promote our proprietary ~~smart~~ device and DNA medicine candidates before we receive regulatory approval from the FDA or comparable foreign regulatory authorities. If we do not receive regulatory approval for and successfully commercialize any products, we will not generate any revenues from sales of proprietary ~~smart device~~ **devices** and DNA medicine products, and we may not be able to continue our operations. A small number of licensing partners and government contracts ~~currently~~ **have** ~~account~~ **accounted** for a substantial portion of our revenue. **In** ~~We currently derive, and in~~ the past we have derived ~~,~~ a significant portion of our revenue from a limited number of licensing partners and government grants and contracts **, and we expect that a significant portion of our revenue will continue to be derived from a limited number of licensing partners and / or government grants and contracts unless and until we are able to commercialize our product candidates**. Revenue can fluctuate significantly depending on the timing of upfront and event- based payments and work performed. If we fail to sign additional future contracts with major licensing partners and the government, if a contract is delayed or deferred, or if an existing contract expires or is canceled and we fail to replace the contract with new business, our revenue would be adversely affected. We will need substantial additional capital to develop our DNA medicines and proprietary ~~smart~~ device technology, which may prove difficult ~~and~~ **or** costly to obtain. Conducting the costly and time- consuming research, pre- clinical studies and clinical testing necessary to obtain regulatory approvals and bring our DNA medicine candidates and proprietary ~~smart~~ device technology to market will require a commitment of substantial funds in excess of our current capital. Our future capital requirements will depend on many factors, including, among others: • the progress of our current and new product development programs; • the progress, scope and results of our pre- clinical and clinical testing; • the time and cost involved in obtaining regulatory approvals; • the cost of manufacturing our DNA medicine candidates; • the cost of prosecuting, enforcing and defending against patent infringement claims and other intellectual property rights; • debt service obligations; • competing technological and market developments; and • our ability and the related costs to establish and maintain collaborative and other arrangements with third parties to assist in potentially bringing our products to market. Additional financing may not be available on acceptable terms, or at all. Domestic and international capital markets have from time to time experienced heightened volatility, particularly in light of geopolitical turmoil, inflation and rising interest rates, making it more difficult in many cases to raise capital through the issuance of equity securities. Volatility in the capital markets can also negatively impact the cost and availability of credit, creating illiquid credit markets and wider credit spreads. Concern about the stability of the markets generally and the strength of counterparties specifically has led many lenders and institutional investors to reduce, and in some cases cease to provide, funding to borrowers. To the extent we are able to raise additional capital through the sale of equity securities, or we issue securities in connection with another transaction in the future, the ownership position of existing stockholders could be substantially diluted. If additional funds are raised through the issuance of preferred stock or debt securities, these securities are likely to have rights, preferences and privileges senior to our common stock and may involve significant fees, interest expense, restrictive covenants and the granting of security interests in our assets. Rising interest rates could also increase the costs of any debt financing we may obtain. Raising capital through a licensing or other transaction involving our intellectual property could require us to relinquish valuable intellectual property rights and thereby sacrifice long- term value for short- term liquidity. Our failure to successfully address ongoing liquidity requirements would have a substantially negative impact on our business. If we are unable to obtain additional capital on acceptable terms when needed, we may need to take actions that adversely affect our business, our stock price and our ability to achieve cash flow in the future, including possibly surrendering our rights to some technologies or product opportunities, delaying our clinical trials or curtailing or ceasing operations. Risks Related to Product

Development, Manufacturing and Regulatory Approval If we are unable to obtain FDA approval of our product candidates, we will not be able to commercialize them in the United States. We need FDA approval prior to marketing our proprietary ~~smart~~ device and DNA medicine candidates in the United States. If we fail to obtain FDA approval to market our proprietary ~~smart~~ device and DNA medicine candidates, we will be unable to sell our products in the United States, which will significantly impair our ability to generate any revenues. This regulatory review and approval process, which includes evaluation of preclinical studies and clinical trials of our products as well as the evaluation of our manufacturing processes and our third- party contract manufacturers' facilities, is lengthy, expensive and uncertain. To receive approval, we must, among other things, demonstrate with substantial evidence from well- controlled clinical trials that our proprietary ~~smart~~ device and DNA medicine candidates are both safe and effective for each indication for which approval is sought. To the extent that our DNA medicine candidates are manufactured at multiple sites or using different processes, we will also need to demonstrate comparability across the manufacturing batches in order to obtain regulatory approval. Satisfaction of the approval requirements typically takes several years and the time needed to satisfy them may vary substantially, based on the type, complexity and novelty of the product. We do not know if or when we might receive regulatory approvals for our proprietary ~~smart~~ device and any of our DNA medicine candidates currently under development. Moreover, any approvals that we obtain may not cover all of the clinical indications for which we are seeking approval, or could contain significant limitations in the form of narrow indications, warnings, precautions or contra- indications with respect to conditions of use. In such event, our ability to generate revenues from such products would be greatly reduced and our business would be harmed. The FDA has substantial discretion in the approval process and may either refuse to consider our application for substantive review or may form the opinion after review of our data that our application is insufficient to allow approval of our proprietary ~~smart~~ device and DNA medicine candidates. If the FDA does not consider or approve our application, it may require that we conduct additional clinical, preclinical or manufacturing validation studies and submit that data before it will reconsider our application. Depending on the extent of these or any other studies, approval of any applications that we submit may be delayed by several years, or may require us to expend more resources than we have available. It is also possible that additional studies, if performed and completed, may not be successful or considered sufficient by the FDA for approval or even to make our applications approvable. If any of these outcomes occur, we may be forced to abandon one or more of our applications for approval, which might significantly harm our business and prospects. It is possible that none of our product candidates or any product we may seek to develop in the future will ever obtain the appropriate regulatory approvals necessary for us or our collaborators to commence product sales. Any delay in obtaining, or an inability to obtain, applicable regulatory approvals would prevent us from commercializing our products, generating revenues and achieving and sustaining profitability. **Furthermore, because our product candidates are combination products comprising an electroporation device for delivery of a biologic, additional time may be required to obtain regulatory approval for our product candidates because of the complexity involved with co- packaging a drug- device combination product. In addition, if the FDA and similar regulatory agencies do not approve our delivery devices, then we will not be able to bring to market our DNA medicines that rely on delivery by such a device. Such delays or failure to obtain approval of our devices would result in significant harm to our business. If we pursue accelerated approval for INO- 3107 or any of our other product candidates, it may not lead to a faster development or regulatory review or approval process and does not increase the likelihood that our product candidates will receive marketing approval. We plan to pursue accelerated approval for our product candidate INO- 3107 and may in the future decide to pursue accelerated approval for one or more of our other product candidates. Under the FDA' s accelerated approval program, the FDA may approve a drug or biologic for a serious or life- threatening disease or condition that provides a meaningful advantage over available therapies based upon a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit. For drugs or biologics granted accelerated approval, post- marketing confirmatory trials are required to verify and describe the anticipated effect on irreversible morbidity or mortality or other clinical benefit. These confirmatory trials must be completed with due diligence, and the FDA may require that the trial be designed, initiated, and / or fully enrolled prior to approval. If we pursue accelerated approval for INO- 3107 for the treatment or RRP, or a future product candidate for another disease or condition, we would do so on the basis that there is no available therapy for that disease or condition or that our product candidate provides a benefit over available therapy. If standard of care were to evolve or if any of our competitors were to receive full approval on the basis of a confirmatory trial for a drug or biologic for a disease or condition for which we are seeking accelerated approval before we receive accelerated approval, the disease or condition would no longer qualify as one for which there is no available therapy, and accelerated approval of our product candidate would not occur without a showing of benefit over available therapy. The treatment landscape can change quickly as the FDA converts accelerated approvals to full approvals on the basis of successful confirmatory trials. We have received feedback from the FDA that data from our completed Phase 1 / 2 clinical trial of INO- 3107 for the treatment of RRP can be used to support the submission of a BLA for review under the accelerated approval program; however, whether any trial is sufficient to receive FDA approval under the accelerated approval pathway will depend on the safety and efficacy results of such trial and will only be determined by the FDA upon review of a submitted BLA. Moreover, the FDA may withdraw approval of INO- 3107 or any future product candidate approved under the accelerated approval pathway if, for example: • the trial or trials required to verify the predicted clinical benefit of our product candidate fail to verify such benefit or do not demonstrate sufficient clinical benefit to justify the risks associated with such product; • other evidence demonstrates that our product candidate is not shown to be safe or effective under the conditions of use; • we fail to conduct any required post- approval trial of our product candidate with due diligence; or • we disseminate false or misleading promotional materials relating to the relevant product candidate.**

**In addition, the FDA may terminate the accelerated approval program or change the standards under which accelerated approvals are considered and granted in response to public pressure or other concerns regarding the accelerated approval program. Changes to or termination of the accelerated approval program could prevent or limit our ability to obtain accelerated approval of any of our clinical development programs.** Even if our products receive regulatory approval in the United States, we may never receive approval or commercialize our products outside of the United States, and the same risk applies for products approved outside the United States, with respect to regulatory approval in the United States. In order to market any proprietary ~~smart~~ device and DNA medicine candidates outside of the United States, we must establish and comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy. Approval procedures vary among countries and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries might differ from that required to obtain FDA approval, and the regulatory approval process in other countries may include all of the risks detailed above regarding FDA approval in the United States as well as other risks. Furthermore, regulatory approval in one country does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country may have a negative effect on the regulatory process in others. Failure to obtain regulatory approval in other countries or any delay or setback in obtaining such approval could have the same adverse effects detailed above regarding FDA approval in the United States. Such effects include the risks that our DNA medicine candidates may not be approved for all indications requested, which could limit the uses of our DNA medicine candidates and have an adverse effect on their commercial potential or require costly, post- marketing follow- up studies. Clinical trials involve a lengthy and expensive process with an uncertain outcome, and results of earlier studies and trials may not be predictive of future trial results. Clinical testing is expensive and can take many years to complete, and its outcome is uncertain. Failure can occur at any time during the clinical trial process. The results of preclinical studies and early clinical trials of our product candidates may not be predictive of the results of later- stage clinical trials. Results from one study may not be reflected or supported by the results of similar studies. Results of an animal study may not be indicative of results achievable in human studies. Human- use equipment and DNA medicine candidates in later stages of clinical trials may fail to show the desired safety and efficacy traits despite having progressed through preclinical studies and initial clinical testing. The time required to obtain approval by the FDA and similar foreign authorities is unpredictable but typically takes many years following the commencement of clinical trials, depending upon numerous factors. In addition, approval policies, regulations, or the type and amount of clinical data necessary to gain approval may change. We have not obtained regulatory approval for any human- use products. Our product candidates could fail to complete the clinical trial process for many reasons, including the following: • we may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that our proprietary ~~smart~~ device or product candidate is safe and effective for any indication; • the results of clinical trials may not meet the level of clinical or statistical significance required by the FDA or comparable foreign regulatory authorities for approval; • the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our clinical trials; • we may not be successful in enrolling a sufficient number of participants in clinical trials; • we may be unable to demonstrate that our proprietary ~~smart~~ device or DNA medicine candidates' clinical and other benefits outweigh their safety risks; • we may be unable to demonstrate that our proprietary ~~smart~~ device or product candidate presents an advantage over existing therapies, or over placebo in any indications for which the FDA requires a placebo- controlled trial; • the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data from preclinical studies or clinical trials; • the data collected from clinical trials of our DNA medicine candidates may not be sufficient to support the submission of a new drug application or other submission or to obtain regulatory approval in the United States or elsewhere; • the FDA or comparable foreign regulatory authorities may fail to approve our manufacturing processes or facilities or that of third- party manufacturers with which we or our collaborators contract for clinical and commercial supplies; and • the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval. Delays in the commencement, conduct or completion of clinical testing could result in increased costs to us and delay or limit our ability to generate revenues. Delays in the commencement, conduct or completion of clinical testing could significantly affect our product development costs. We do not know whether planned clinical trials will begin on time or be completed on schedule, if at all. In addition, ongoing clinical trials may not be completed on schedule, or at all, and could be placed on a hold by the regulators for various reasons. The commencement and completion of clinical trials can be delayed for a number of reasons, including delays related to: • obtaining regulatory approval to commence a clinical trial; • adverse results from third **-** party clinical trials involving gene- based therapies and the regulatory response thereto; • reaching agreement on acceptable terms with prospective CROs and trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites; • future bans or stricter standards imposed on clinical trials of gene- based therapy; • manufacturing sufficient quantities of our proprietary ~~smart~~ device and DNA medicine candidates for use in clinical trials; • obtaining Internal Review Board, or IRB, approval to conduct a clinical trial at a prospective site; • slower than expected recruitment and enrollment of patients to participate in clinical trials for a variety of reasons, including competition from other clinical trial programs for similar indications; • conducting clinical trials with sites internationally due to regulatory approvals and meeting international standards; • retaining patients who have initiated a clinical trial but may be prone to withdraw due to side effects from the therapy, lack of efficacy or personal issues, or who are lost to further follow- up; • collecting, reviewing and analyzing our clinical trial data; and • global unrest, including geopolitical risks emanating from countries such as Russia and China, global pathogen outbreaks or pandemics, terrorist activities, **the conflict between Israel** and **Hamas, bank failures and other** economic and other external factors beyond our control. With respect to clinical trials of product candidates for rare diseases, such as our ~~clinical~~ **planned confirmatory** trial of INO- 3107 for the treatment of recurrent respiratory papillomatosis, or RRP, we may encounter difficulties in recruiting a sufficient number of patients to enroll in the trial due to the small number of patients with the disease. Because RRP is caused by specific HPV types, 6 and 11, and there is currently no standard protocol

for diagnostic / screening of RRP patients unless there are symptoms of **dysphonia,** respiratory distress **or other symptoms related to the presence of papillomas** , it may be difficult to identify and diagnose patients for whom INO- 3107 may be a potential treatment. Clinical trials may also be delayed as a result of ambiguous or negative interim results. In addition, a clinical trial may be suspended or terminated by us, the FDA, the IRB overseeing the clinical trial at issue, any of our clinical trial sites with respect to that site, or other regulatory authorities due to a number of factors, including: • failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols; • inspection of the clinical trial operations or trial sites by the FDA or other regulatory authorities resulting in the imposition of a clinical hold; • unforeseen safety issues; and • lack of adequate funding to continue the clinical trial. If we experience delays in completion of, or if we terminate, any of our clinical trials, the commercial prospects for our proprietary ~~smart~~ device and our DNA medicine candidates may be harmed and our ability to generate product revenues will be delayed or eliminated altogether ~~. For example, in November 2022 we announced the discontinuation of the development programs for our product candidates INO- 4700 for MERS and INO- 4500 for Lassa Fever~~ . In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate. Further, delays in the commencement, conduct or completion of clinical trials may adversely affect the trading price of our common stock. None of our DNA medicine candidates have been approved for sale, and we may never develop commercially successful DNA medicine products. Our DNA medicines programs are in various stages of research and development, and currently include DNA medicine candidates in discovery, preclinical studies and Phase 1, 2 and 3 clinical trials. There are limited data regarding the efficacy of DNA medicine candidates compared with conventional vaccines, and we must conduct a substantial amount of additional research and development before the FDA or any comparable foreign regulatory authority will approve any of our DNA medicine candidates. The success of our efforts to develop and commercialize our DNA medicine candidates could be delayed or fail for a number of reasons. For example, we could experience delays in product development and clinical trials. Our DNA medicine candidates could be found to be ineffective or unsafe, or otherwise fail to receive necessary regulatory clearances to proceed with further clinical development or to be approved for marketing. Our products, even if they are deemed to be safe and effective by regulatory authorities, could be difficult to manufacture on a large scale or uneconomical to market, or our competitors could develop superior products more quickly and efficiently or more effectively market their competing products. In addition, adverse events, or the perception of adverse events, relating to vaccine and immunotherapy candidates and delivery technologies may negatively impact our ability to develop commercially successful products. For example, pharmaceutical companies have been subject to claims that the use of some pediatric vaccines has caused personal injuries, including brain damage, central nervous system damage and autism. These and other claims may influence public perception of the use of vaccine and immunotherapy products and could result in greater governmental regulation, stricter labeling requirements and potential regulatory delays in the testing or approval of our potential products. We previously expended significant resources on the development of a COVID- 19 vaccine candidate. We are now only pursuing development in collaboration with third parties, as both a primary and heterologous booster vaccine, but there can be no assurance that our candidate will ever receive regulatory approval as a primary vaccine or a booster in any country, whether by Emergency Use Authorization or otherwise. Beginning in 2020, we expended significant resources on the clinical development of a COVID- 19 vaccine candidate, INO- 4800. We were previously conducting a Phase 2 / 3 clinical trial of INO- 4800 called INNOVATE. Based on regulatory feedback and the competitive landscape for COVID- 19 vaccines, in 2022 we discontinued the INNOVATE trial and pursued a strategy to develop our COVID- 19 vaccine as a potential heterologous booster following administration of other primary vaccines. Following an assessment of the current global demand for COVID- 19 vaccines, changes in regulatory timelines and requirements, diminishing government financial support, and the overall growing uncertainty related to opportunities for heterologous booster vaccines, in the fourth quarter of 2022 we discontinued our internally funded efforts to develop INO- 4800 as a COVID- 19 heterologous booster vaccine. We are no longer conducting any active clinical trials of INO- 4800 and do not expect that it will ever receive regulatory approval in the United States. Our collaborator ~~,~~ Advaccine ~~,~~ **has completed enrollment of** ~~is~~ **its 200 participant homologous and 267- participant heterologous booster vaccine** ~~continuing the clinical development of INO- 4800 in a Phase 2 clinical trial~~ **trials** in China ~~and~~ **. They** may seek an Emergency Use Authorization, or EUA, from regulatory authorities in China and other countries in Asia for the use of INO- 4800 as a heterologous booster. However, any such decision would be made by Advaccine, and there is no guarantee that Advaccine will apply for an EUA or other similar authorization or, if it does apply, that Advaccine will be able to obtain such authorization. An EUA may not be available if countries are no longer in a state of public health emergency, in which case full approval would need to be sought. ~~Our~~ **We await the results of our** COVID- 19 vaccine candidate **' s participation in** ~~continues to be evaluated as part of~~ the World Health Organization' s Solidarity Trial Vaccines. Depending on the results of that trial, we could also pursue a strategy of seeking EUA for the vaccine candidate in other countries outside of the United States. Even if an EUA or other authorization is ultimately granted, we will rely on the applicable regulatory authority policies and guidance governing vaccines authorized in this manner in connection with the marketing and sale of our vaccine candidate. If these policies and guidance change unexpectedly and / or materially or if we misinterpret them, potential sales of our product could be adversely impacted. Regulatory authorities may also terminate an EUA if safety issues or other concerns about our product arise or if we or Advaccine fail to comply with the conditions of authorization. If we or Advaccine apply for an EUA or similar authorization from regulatory authorities outside of the United States, the failure to obtain such authorization or the termination of such an authorization, if obtained, would adversely impact our and Advaccine' s ability to market and sell our COVID- 19 vaccine. DNA medicines are a novel approach to treating and preventing disease, and **our CELLECTRA ® delivery devices are a novel approach to administering medicines, and** negative perception of the efficacy, safety, or tolerability of any investigational medicines we develop **or our devices** could adversely affect our ability to conduct our business, advance our investigational medicines, or obtain regulatory approvals. No DNA medicines have been granted EUA or have been approved to

date by the FDA. Adverse events in clinical trials of our investigational medicines or in clinical trials of others developing similar products and the resulting publicity, as well as any other adverse events in the field of DNA medicine, or other products that are perceived to be similar to DNA medicines, such as those related to other nucleic acid based vaccines such as mRNA vaccines, gene therapy or gene editing, could result in a decrease in the perceived benefit of one or more of our programs, increased regulatory scrutiny, decreased confidence by patients and clinical trial collaborators in our investigational medicines, and less demand for any product that we may develop. Our pipeline of DNA medicine candidates could result in a greater quantity of reportable adverse events, including suspected unexpected serious adverse reactions, other reportable negative clinical outcomes, manufacturing reportable events or material clinical events that could lead to clinical delay or hold by the FDA or applicable regulatory authority or other clinical delays, any of which could negatively impact the perception of one or more of our programs, as well as our business as a whole. In addition, responses by U. S., state, or foreign governments to negative public perception may result in new legislation or regulations that could limit our ability to develop any investigational medicines or commercialize any approved products, obtain or maintain regulatory approval, or otherwise achieve profitability. More restrictive statutory regimes, government regulations, or negative public opinion would have an adverse effect on our business, financial condition, results of operations, and prospects and may delay or impair the development of our investigational medicines and commercialization of any approved products or demand for any products we may develop. **In addition, the novelty of our CELLECTRA ® delivery devices may make it difficult to demonstrate to physicians and third- party payors that this delivery system is an appropriate approach for DNA medicines and provides advantages compared to the current standards of care. Further, if we or our commercialization and collaboration partners are not successful in conveying to physicians, patients and third- party payors that our CELLECTRA ® delivery devices provide useful patient outcomes, we or our commercialization and collaboration partners may experience reluctance, or refusal, on the part of physicians to order and use, and third- party payors to cover and provide adequate reimbursement for, our DNA medicines.** If we and the contract manufacturers upon whom we rely fail to produce our proprietary ~~smart~~ devices and DNA medicine candidates in the volumes that we require on a timely basis, or at all, or if these contractors fail to comply with their obligations to us or with stringent regulations, we may face delays in the development and commercialization of our proprietary ~~smart~~ device and DNA medicine candidates. We manufacture some components of our proprietary ~~smart~~ devices and utilize the services of contract manufacturers to manufacture the remaining components of these devices. We also rely on third party contract manufacturers to produce our DNA medicine candidates for use in our clinical trials and potentially for commercial distribution, if any product candidate is approved by regulatory authorities. The manufacture of these devices and our DNA medicine candidates requires significant expertise and capital investment, including the development of advanced manufacturing techniques and process controls. Manufacturers often encounter difficulties in production, particularly in scaling up for commercial production. These problems include difficulties with production costs and yields, quality control, including stability of the equipment and DNA medicine candidates and quality assurance testing, shortages of qualified personnel, as well as compliance with strictly enforced federal, state and foreign regulations. If we or our manufacturers were to encounter any of these difficulties or our manufacturers otherwise fail to comply with their obligations to us, our ability to provide our proprietary ~~smart~~ device to our partners and to supply DNA medicine candidates for clinical trials or to commercially launch a product would be jeopardized. For example, we previously relied on VGXI to manufacture DNA plasmids for our DNA medicine candidates **before** ~~, including INO- 4800. In 2020, VGXI notified us that~~ they **became** ~~would be~~ unable to produce the necessary plasmids ~~to meet this timeline~~ due to a lack of manufacturing capacity. As a result, we had to engage several additional third- party contract manufacturers. However, there can be no assurance that we will be able to secure adequate additional manufacturing capacity for any of our DNA medicine candidates on commercially reasonable terms. Our inability to secure sufficient manufacturing capacity, or our inability to transfer necessary manufacturing know- how to third parties, would adversely affect our commercialization plans and could also harm our reputation. Furthermore, any delay or interruption in the supply of clinical trial supplies for our DNA medicine candidates could delay the completion of our clinical trials, increase the costs associated with maintaining our clinical trial program and, depending upon the period of delay, require us to commence new trials at significant additional expense or terminate the trials completely. In addition, all manufacturers of our products must comply with cGMP requirements enforced by the FDA through its facilities inspection program. These requirements include, among other things, quality control, quality assurance and the generation and maintenance of records and documentation. Manufacturers of our products may be unable to comply with these cGMP requirements and with other FDA, state and foreign regulatory requirements. We have little control over our manufacturers' compliance with these regulations and standards. A failure to comply with these requirements may result in fines and civil penalties, suspension of production, suspension or delay in product approval, product seizure or recall, or withdrawal of product approval. If the safety of any product is compromised due to our or our manufacturers' failure to adhere to applicable laws or for other reasons, we may not be able to obtain regulatory approval for or successfully commercialize our products, and we may be held liable for any injuries sustained as a result. Any of these factors could cause a delay of clinical trials, regulatory submissions, approvals or commercialization of our products, entail higher costs or result in our being unable to effectively commercialize our products. Furthermore, if our manufacturers fail to deliver the required commercial quantities on a timely basis, pursuant to provided specifications and at commercially reasonable prices, we may be unable to meet demand for our products and would lose potential revenues. Our product candidates are combination products regulated under both the biologic and device regulations of the Public Health Service Act and Federal Food, Drug, and Cosmetic Act. Third- party manufacturers may not be able to comply with cGMP regulations, regulations applicable to biologic / device combination products, including applicable provisions of the FDA' s drug cGMP regulations, device cGMP requirements embodied in the quality system regulations or similar regulatory requirements outside the United States. Our failure, or the failure of our third- party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of

approvals, license revocation, seizures or recalls of product candidates, operating restrictions and criminal prosecutions, any of which could significantly affect supplies of our product candidates. We are dependent on single- source suppliers for some of the components and materials used in, and the processes required to develop, our product candidates and investigational medicines. We currently depend on single- source suppliers for some of the components and materials used in, and manufacturing processes required to develop and commercialize, our product candidates and investigational medicines. We cannot ensure that these suppliers or service providers will remain in business, have sufficient capacity or supply to meet our needs, or that they will not be purchased by one of our competitors or another company that may not be interested in continuing to work with us. Our use of single- source suppliers of raw materials, components, key processes, and finished goods exposes us to several risks, including disruptions in supply, price increases, or late deliveries. There are, in general, relatively few alternative sources of supply for substitute components. These vendors may be unable or unwilling to meet our future demands for our clinical trials or commercial sale. Establishing additional or replacement suppliers for these components, materials, and processes could take a substantial amount of time and it may be difficult to establish replacement suppliers who meet regulatory requirements. Any disruption in supply from any single- source supplier or service provider could lead to supply delays or interruptions which would damage our business, financial condition, results of operations, and prospects. If we have to switch to a replacement supplier, the manufacture and delivery of our product candidates or investigational medicines could be interrupted for an extended period, which could adversely affect our business. Establishing additional or replacement suppliers for any of the components or processes used in our product candidates or investigational medicines, if required, may not be accomplished quickly. If we are able to find a replacement supplier, the replacement supplier would need to be qualified and may require additional regulatory authority approval, which could result in further delay. While we seek to maintain adequate inventory of the single- source components and materials used in our product candidates, any interruption or delay in the supply of components or materials, or our inability to obtain components or materials from alternate sources at acceptable prices in a timely manner, could impair our ability to supply our investigational medicines. Our reliance on these suppliers, service providers, and manufacturers subjects us to a number of risks that could harm our reputation, business, and financial condition, including, among other things: • delays to the development timelines for our development candidates or investigational medicines; • interruption of supply resulting from modifications to or discontinuation of a supplier' s operations; • delays in product shipments resulting from uncorrected defects, reliability issues, or a supplier' s variation in a component; • a lack of long- term supply arrangements for key components with our suppliers; • inability to obtain adequate supply in a timely manner, or to obtain adequate supply on commercially reasonable terms; • difficulty and cost associated with locating and qualifying alternative suppliers for our components in a timely manner; • production delays related to the evaluation and testing of components from alternative suppliers, and corresponding regulatory qualifications; • delay in delivery due to our suppliers' prioritizing other customer orders over ours; • damage to our reputation caused by defective components produced by our suppliers; and • fluctuation in delivery by our suppliers due to changes in demand from us or their other customers. If any of these risks materialize, costs could significantly increase and our ability to meet demand for our products could be impacted. Even if our products receive regulatory approval, they may still face future development and regulatory difficulties. Even if United States regulatory approval is obtained, regulators may still impose significant restrictions on a product' s indicated uses or marketing or impose ongoing requirements for potentially costly post- approval studies. This governmental oversight may be particularly strict with respect to gene- based therapies. Our products will also be subject to ongoing FDA requirements governing the labeling, packaging, storage, advertising, promotion, record keeping and submission of safety and other post-market information. For example, the FDA strictly regulates the promotional claims that may be made about medical products. In particular, a product may not be promoted for uses that are not approved by the FDA as reflected in the product' s approved labeling. Physicians, on the other hand, may prescribe products for off- label uses. Although the FDA and other regulatory agencies do not regulate a physician' s choice of drug treatment made in the physician' s independent medical judgment, they do restrict promotional communications from companies or their sales force with respect to off- label uses of products for which marketing clearance has not been issued. However, companies may in certain circumstances share truthful and not misleading information that is otherwise consistent with the product' s FDA approved labeling. In addition, manufacturers of drug products and their facilities are subject to continual review and periodic inspections by the FDA and other regulatory authorities for compliance with current good manufacturing practices, or cGMP, regulations. If we or a regulatory agency discover previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, a regulatory agency may impose restrictions on that product, the manufacturer or us, including requiring withdrawal of the product from the market or suspension of manufacturing. If we, our DNA medicine candidates, or the manufacturing facilities for our DNA medicine candidates fail to comply with applicable regulatory requirements, a regulatory agency may: • issue Warning Letters or untitled letters; • impose civil or criminal penalties; • suspend regulatory approvals; • suspend any ongoing clinical trials; • refuse to approve pending applications or supplements to applications filed by us; • impose restrictions on operations, including costly new manufacturing requirements; or • seize or detain products or require us to initiate a product recall. We are developing some of our investigational DNA medicines ~~and sometimes~~ using new endpoints or methodologies for the treatment of diseases in which there is little clinical experience. As a result, the FDA or other regulatory authorities may not consider the endpoints of our clinical trials to provide clinically meaningful results. There are no pharmacologic therapies approved to treat the underlying causes of many diseases that we currently attempt to address or may address in the future. There has been limited clinical trial experience for the development of pharmaceuticals to treat these rare diseases in general, and we are not aware of a registrational trial that led to approval of a drug to treat these diseases. There have been some historical trials with other agents which may have utilized clinical endpoints that are less applicable to our efforts that address the underlying defect. As a result, the design and conduct of clinical trials of investigational medicines for the treatment of these disorders and other disorders may take longer, be more costly, or be less

effective as part of the novelty of development in these diseases. For example, our product candidate INO- 3107 is being developed for RRP, a rare condition for which there are no approved non- surgical treatments ~~. In particular, there are challenges associated with agreeing to a primary endpoint with the FDA for the treatment of RRP where no precedent exists~~ . Even if the FDA does find our success criteria to be sufficiently validated and clinically meaningful, we may not achieve the pre- specified endpoint to a degree of statistical significance in any pivotal or other clinical trials we or our strategic collaborators may conduct for our programs. Further, even if we do achieve the pre- specified criteria, our trials may produce results that are unpredictable or inconsistent with the results of the more traditional efficacy endpoints in the trial. The FDA also could give overriding weight to other efficacy endpoints over a primary endpoint, even if we achieve statistically significant results on that endpoint, if we do not do so on our secondary efficacy endpoints. The FDA also weighs the benefits of a product against its risks and the FDA may view the efficacy results in the context of safety as not being supportive of licensure. Other regulatory authorities in Europe and other countries may make similar findings with respect to these endpoints. We have obtained Orphan Drug Designation for one of our DNA medicine candidates. As part of our business strategy, we may continue to seek Orphan Drug Designation for additional DNA medicine candidates, and we may be unsuccessful in obtaining new designations or may be unable to obtain or maintain the benefits associated with Orphan Drug Designation, including the potential for orphan drug exclusivity. We have obtained Orphan Drug Designation from the FDA for INO- 3107 for the treatment of RRP. We have sought and may continue to seek Orphan Drug Designation for one or more of our other DNA medicine candidates, although we may be unsuccessful in doing so. Regulatory authorities in some jurisdictions, including the United States and Europe, may designate drugs for relatively small patient populations as orphan drugs. Under the Orphan Drug Act, the FDA may designate a drug as an orphan drug if it is a drug intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200, 000 individuals in the United States, or a patient population greater than 200, 000 in the United States where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the United States. In the United States, Orphan Drug Designation entitles a party to financial incentives such as tax advantages and user fee waivers. Opportunities for grant funding toward clinical trial costs may also be available for clinical trials of drugs for rare diseases, regardless of whether the drugs are designated for the orphan use. In addition, if a product that has Orphan Drug Designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications to market the same product for the same indication for seven years, except in limited circumstances. Although we have obtained Orphan Drug Designation for INO- 3107 for the treatment of RRP, and even if we obtain Orphan Drug Designation for our other DNA medicine candidates in specific indications, we may not be the first to obtain marketing approval of these DNA medicine candidates for the orphan- designated indication due to the uncertainties associated with developing pharmaceutical products. If a competitor with a product that is determined by the FDA to be the same as one of our DNA medicine candidates obtains marketing approval before us for the same indication we are pursuing and obtains orphan drug exclusivity, our product candidate may not be approved until the period of exclusivity ends unless we are able to demonstrate that our product candidate is clinically superior. Even after obtaining approval, we may be limited in our ability to market our product. In addition, exclusive marketing rights in the United States may be limited if we seek approval for an indication broader than the orphan- designated indication or may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition. Further, even if we obtain orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different drugs with different principal molecular structural features can be approved for the same condition. Even after an orphan product is approved, the FDA can subsequently approve the same drug with the same principal molecular structural features for the same condition if the FDA concludes that the later drug is safer, more effective or makes a major contribution to patient care. Orphan Drug Designation neither shortens the development time or regulatory review time of a drug nor gives the drug any advantage in the regulatory review or approval process. In addition, while we may seek Orphan Drug Designation for some of our DNA medicine candidates, we may never receive such designations. A breakthrough therapy designation or fast track designation by the FDA for a drug may not lead to a faster development or regulatory review or approval process, and it would not increase the likelihood that the drug will receive marketing approval. We **have received** ~~may seek a~~ breakthrough therapy designation for **INO- 3107 and may seek this designation for** one or more of our **other** investigational medicines. A breakthrough therapy is defined as a drug that is intended, alone or in combination with one or more other drugs, to treat a serious or life- threatening disease or condition, and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For drugs that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Drugs designated as breakthrough therapies by the FDA are also eligible for priority review if supported by clinical data at the time of the regulatory submission. Designation as a breakthrough therapy is at the discretion of the FDA. Accordingly, even if we believe that one of our investigational medicines meets the criteria for designation as a breakthrough therapy, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of a breakthrough therapy designation for a drug may not result in a faster development process, review, or approval compared to drugs considered for approval under conventional FDA procedures and it would not assure ultimate approval by the FDA. Even if we are successful in obtaining accelerated approval in the United States or under comparable pathways in other jurisdictions, we may face requirements and limitations that will adversely affect our prospects. For example, we may be approved only for a very limited indication, we may not successfully complete required post- approval trials, such trials may not confirm the clinical benefit of our drug, or approval of the drug may be withdrawn. In addition, even if one or more of our investigational medicines

qualify as breakthrough therapies, the FDA may later decide that the investigational medicine no longer meets the conditions for qualification or it may decide that the time period for FDA review or approval will not be shortened. Risks Related to Reliance on Third Parties If we lose or are unable to secure collaborators or partners, or if our collaborators or partners do not apply adequate resources to their relationships with us, our product development and potential for profitability will suffer. We have entered into, and may continue to enter into, distribution, co- promotion, partnership, sponsored research and other arrangements for development, manufacturing, sales, marketing and other commercialization activities relating to our products. For example, in the past we have entered into license and collaboration agreements to develop, obtain regulatory approval for and commercialize our DNA medicine candidates for specified indications, including in jurisdictions outside of the United States. The amount and timing of resources applied by our collaborators are largely outside of our control. If any of our current or future collaborators breaches or terminates our agreements, or fails to conduct our collaborative activities in a timely manner, our commercialization of products could be diminished or blocked completely. We may not receive any event- based payments, milestone payments or royalty payments under our collaborative agreements if our collaborative partners fail to develop products in a timely manner or at all. It is possible that collaborators will change their strategic focus, pursue alternative technologies or develop alternative products, either on their own or in collaboration with others. Further, we may be forced to fund programs that were previously funded by our collaborators, and we may not have, or be able to access, the necessary funding. The effectiveness of our partners, if any, in marketing our products will also affect our revenues and earnings. We desire to enter into new collaborative agreements. However, we may not be able to successfully negotiate any additional collaborative arrangements and, if established, these relationships may not be scientifically or commercially successful. Our success in the future depends in part on our ability to strategically enter into agreements with other organizations. This can be difficult due to internal and external constraints placed on these organizations. Some organizations may have insufficient administrative and related infrastructure to enable collaborations with many companies at once, which can extend the time it takes to develop, negotiate, implement and execute a collaboration. Once news of discussions regarding possible collaborations are known in the medical community, regardless of whether the news is accurate, failure to announce a collaborative agreement or the entity' s announcement of a collaboration with another entity may result in adverse speculation about us, resulting in harm to our reputation and our business. Disputes could also arise between us and our existing or future collaborators, as to a variety of matters, including financial and intellectual property matters or other obligations under our agreements. These disputes could be both expensive and time- consuming and may result in delays in the development and commercialization of our products or could damage our relationship with a collaborator. We have agreements with government agencies **that** ~~, which~~ are subject to termination and uncertain future funding ~~, which~~ **. Termination or cessation of funding** ~~could~~ **would** have a negative impact on our ability to develop certain of our pipeline candidates and / or require us to seek alternative funding sources to advance product candidates. We have entered into agreements with government agencies, such as the National Institutes of Health' s National Institute of Allergy and Infectious Diseases, DARPA, Medical CBRN Defense Consortium and the Department of Defense **(DoD)** Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense ~~, or DoD~~ , and we intend to continue entering into these types of agreements **with government agencies** in the future. Our business is partially dependent on the continued performance by these government agencies of their responsibilities under these agreements, including adequate continued funding of the agencies and their programs. We have no control over the resources and funding that government agencies may devote to these agreements, which may be subject to annual renewal and which generally may be terminated by the government agencies at any time. For example, in ~~April~~ 2021 ~~we were notified by~~ the DoD ~~that it~~ discontinued funding for the **planned** Phase 3 ~~segment of our INNOVATE~~ trial **of our COVID- 19 product candidate** , which resulted in increased expenditures by us. Government agencies may fail to perform their responsibilities under these agreements, which may cause them to be terminated by the government agencies. In addition, we may fail to perform our responsibilities under these agreements. Many of our government agreements are subject to audits, which may occur several years after the period to which the audit relates. If an audit identifies significant unallowable costs, we could incur a material charge to our earnings or reduction in our cash position. As a result, we may be unsuccessful entering, or ineligible to enter, into future government agreements. We and our collaborators rely on third parties to conduct our clinical trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, we and our collaborators may not be able to obtain regulatory approval for or commercialize our DNA medicine candidates. We and our collaborators have entered into agreements with CROs to provide monitors for and to manage data for our on- going clinical programs. We and the CROs conducting clinical trials for our proprietary ~~smart~~ device and DNA medicine candidates are required to comply with current good clinical practices, or GCPs, regulations and guidelines enforced by the FDA for all of our products in clinical development. The FDA enforces GCPs through periodic inspections of trial sponsors, principal investigators and trial sites. If we or the CROs conducting clinical trials of our DNA medicine candidates fail to comply with applicable GCPs, the clinical data generated in the clinical trials may be deemed unreliable and the FDA may require additional clinical trials before approving any marketing applications. If any relationships with CROs terminate, we or our collaborators may not be able to enter into arrangements with alternative CROs. In addition, these third- party CROs are not our employees, and we cannot control whether or not they devote sufficient time and resources to our on- going clinical programs or perform trials efficiently. These CROs may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical studies or other drug development activities, which could harm our competitive position. If CROs do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced, or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols, regulatory requirements, or for other reasons, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval for or successfully commercialize our DNA medicine candidates. As a result, our financial results and the commercial prospects for our DNA medicine candidates would be harmed, our costs could increase and our ability to generate revenues could be delayed. Cost

overruns by or disputes with our CROs may significantly increase our expenses. We enter into various contracts in the normal course of our business in which we agree to indemnify the other party to the contract. In the event we have to perform under these indemnification provisions, it could have a material adverse effect on our business, financial condition and results of operations. In the normal course of business, we periodically enter into academic, commercial, service, collaboration, licensing, consulting and other agreements that contain indemnification provisions. With respect to our academic and other research agreements, we typically agree to indemnify the institution and related parties from losses arising from claims relating to the products, processes or services made, used, sold or performed pursuant to the agreements for which we have secured licenses, and from claims arising from our or our sub licensees' exercise of rights under the agreement. With respect to our commercial agreements, we have agreed to indemnify our vendors from any third- party product liability claims that could result from the production, use or consumption of the product, as well as for alleged infringements of any patent or other intellectual property right by a third party. With respect to consultants, we typically agree to indemnify them from claims arising from the good faith performance of their services. Should our obligation under an indemnification provision exceed applicable insurance coverage or if we were denied insurance coverage or not covered by insurance, our business, financial condition and results of operations could be adversely affected. Similarly, if we are relying on a collaborator or other third party to indemnify us and the collaborator or other third party is denied insurance coverage or otherwise does not have assets available to indemnify us, our business, financial condition and results of operations could be adversely affected. Risks Related to Commercialization of Our DNA Medicine Candidates We currently have only a small marketing organization and no sales organization. If we are unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell our products, if approved, we may not be able to generate product revenues. We currently have only a small commercial organization to support pre- commercial activities for our proprietary ~~smart~~ device and DNA medicine candidates, if approved, and we do not currently have a sales organization. In order to **successfully** commercialize **INO- 3107 or** any **other** products **that may receive regulatory approval** , we must build our marketing, sales, distribution, managerial and other non- technical capabilities or make arrangements with third parties to perform these services. We contemplate establishing our own sales force or seeking third- party partners to sell our products. The establishment and development of **a** ~~our own~~ sales force ~~to market any products we may develop~~ **, either on our own or in conjunction with third parties,** will be expensive and time- consuming and could delay any product launch, and we may not be able to successfully develop **or acquire** this capability. We will also have to compete with other pharmaceutical and biotechnology companies to recruit, hire, train and retain marketing and sales personnel. To the extent we rely on third parties to commercialize our approved products, if any, we will receive lower revenues than if we commercialized these products ourselves. In ~~addition, we may have little or no control over the sales efforts of third parties involved in our commercialization efforts. In~~ the event we are unable to **successfully** develop our own marketing and sales force or collaborate with a third- party marketing and sales organization, we would not be able to commercialize our DNA medicine candidates which would negatively impact our ability to generate product revenues. If products for which we receive regulatory approval do not achieve broad market acceptance, the revenues that we generate from their sales will be limited. The commercial success of our proprietary ~~smart~~ device and DNA medicine candidates for which we obtain marketing approval from the FDA or other regulatory authorities will depend upon the acceptance of these products by both the medical community and patient population. Coverage and reimbursement of our DNA medicine candidates by third- party payors, including government payors, generally is also necessary for optimal commercial success. The degree of market acceptance of any of our approved products will depend on a number of factors, including: • our ability to provide acceptable evidence of safety and efficacy; • the relative convenience and ease of administration, including the acceptance and usage of our proprietary ~~smart~~ device by the medical community; • the prevalence and severity of any actual or perceived adverse side effects; • limitations or warnings contained in a product' s FDA- approved labeling, including, for example, potential " black box " warnings; • availability of alternative treatments; • pricing and cost effectiveness; • the effectiveness of our or any future collaborators' sales and marketing strategies; • the **potential** public perception of new therapies and the reputational challenges that the ~~vaccine~~ industry is facing related to **drug costs** ~~the growing momentum of the anti- vaccine movement~~ ; • our ability to obtain sufficient third- party coverage and adequate reimbursement; and • the willingness of patients to pay out of pocket in the absence of third- party coverage. If our proprietary ~~smart~~ device and DNA medicine candidates are approved but do not achieve an adequate level of acceptance by physicians, healthcare payors and patients, we may not generate sufficient revenue from these products, and we may not become or remain profitable. In addition, our efforts to educate the medical community and third- party payors on the benefits of our DNA medicine candidates may require significant resources and may never be successful. We are subject to uncertainty relating to coverage and reimbursement policies which, if not favorable to our DNA medicine candidates, could hinder or prevent our products' commercial success. Patients in the United States and elsewhere generally rely on third- party payors to reimburse part or all of the costs associated with their prescription drugs and medical treatments. Accordingly, our ability to commercialize our proprietary ~~smart~~ device and DNA medicine candidates successfully will depend in part on the extent to which governmental authorities, including Medicare and Medicaid, private health insurers and other third- party payors establish appropriate coverage and reimbursement levels for our DNA medicine candidates and related treatments. As a threshold for coverage and reimbursement, third- party payors in the United States generally require that drug products and vaccines have been approved for marketing by the FDA. Significant uncertainty exists as to the coverage and reimbursement status of any products for which we may obtain regulatory approval. Coverage decisions may not favor new products when more established or lower cost therapeutic alternatives are already available. Even if we obtain coverage for a given product, ~~the associated reimbursement rate may not be adequate to cover our costs, including research, development, intellectual property, manufacture, sale and distribution expenses, or may require~~ co- payments **may be required** that patients find unacceptably high. Patients are unlikely to use our products unless reimbursement is adequate to cover all or a significant portion of the cost of our drug products **. Even if we obtain coverage for our products, the revenue generated may not be adequate to cover our**

**costs, including research, development, intellectual property, manufacture, sale and distribution** . Additionally, some of our products, if approved, will be provided under the supervision of a physician. When used in connection with medical procedures, our DNA medicine candidates may not be reimbursed separately but their cost may instead be bundled as part of the payment received by the provider for the procedure only. Separate reimbursement for the product itself or the treatment or procedure in which our product is used may not be available. A decision by a third- party payor not to cover or separately reimburse for our DNA medicine candidates or procedures using our DNA medicine candidates, could reduce physician utilization of our products once approved. Coverage and reimbursement policies for products can differ significantly from payor to payor as there is no uniform policy of coverage and reimbursement for products among third- party payors in the United States. There may be significant delays in obtaining coverage and reimbursement as the process of determining coverage and reimbursement is often time- consuming and costly which will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage or adequate reimbursement will be obtained. It is difficult to predict at this time what government authorities and third- party payors will decide with respect to coverage and reimbursement for our products. A significant trend in the U. S. healthcare industry and elsewhere is cost containment. Third- party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular products and services. Third- party payors are increasingly challenging the effectiveness of and prices charged for medical products and services. Moreover, the U. S. government, state legislatures and foreign governmental entities have shown significant interest in implementing cost containment programs to limit the growth of government- paid healthcare costs, including price controls, restrictions on reimbursement and coverage and requirements for substitution of generic products for branded prescription drugs. We may not be able to obtain third- party payor coverage or reimbursement for our products in whole or in part. Risks Related to Employee and Operational Matters Our operating results may be harmed if our **corporate** restructuring plans **and cost reduction efforts** do not achieve the anticipated results or cause undesirable consequences. ~~In~~ **Between** July 2022 and ~~again in~~ January 2023, we undertook **a corporate** restructuring ~~plans~~ that resulted in a total reduction in headcount of ~~approximately 79~~ **more than 25 % of our** employees and a significant majority of our contractors **. In August 2023 we announced a further headcount reduction of approximately 30 %. As a result, our full- time employee headcount has declined from more than 300 employees in early 2022 to approximately 122 currently** . Restructuring plans may yield unintended consequences, such as attrition beyond our intended reduction in workforce and reduced employee morale, which may cause our employees who were not affected by the reduction in workforce to seek alternate employment. During the second half of 2022, we experienced increased **voluntary** attrition after conducting the first reduction in force. Additional attrition could impede our ability to meet our operational goals, which could have a material adverse effect on our financial performance. In addition, as a result of the reductions in our workforce, we may face an increased risk of employment litigation. Furthermore, employees whose positions have been or will be eliminated in connection with these restructuring plans may seek future employment with our competitors. Although all our employees are required to sign a confidentiality agreement with us at the time of hire, we cannot be certain that the confidential nature of our proprietary information will be maintained in the course of such future employment. We cannot be certain that any of our restructuring efforts will be successful, or that we will be able to realize the cost savings and other anticipated benefits from our current or any future restructuring plans. In addition, if we continue to reduce our workforce, it may adversely impact our ability to respond rapidly to any new growth or revenue opportunities. Any restructuring activities we undertake may take longer than expected and may require changes to our business that we are unable to implement. If we are unsuccessful in implementing our cost saving initiatives and restructuring plans or if we do not achieve our expected results, our results of operations and cash flows could be adversely affected. We are currently subject to litigation and may become subject to additional litigation, which could harm our business, financial condition and reputation. We may have actions brought against us by stockholders relating to past transactions, changes in our stock price or other matters. For example, numerous purported shareholder class action **and shareholder derivative** complaints **were** ~~have been~~ filed against us **beginning in 2020** , naming us and our directors and executive officers as defendants, ~~and~~ alleging that we made materially false and misleading statements ~~regarding the development of INO- 4800~~ in violation of ~~certain~~ federal securities laws. Although we have ~~settled~~ **resolved** ~~the~~ **these** ~~current class action~~ **actions** ~~securities litigation~~ , there can be no guarantee that we will not become subject to similar claims in the future. We may also become party to litigation with third parties as a result of our business activities. In 2020, we filed a lawsuit against one of our contract manufacturers, who then filed a counterclaim against us alleging that we had breached our contract with them, among other claims. There can be no assurance that we will ultimately prevail in the ongoing litigation matters described in this report or in future litigation matters. These and any potential future actions against us could give rise to substantial damages, which could have a material adverse effect on our financial position, liquidity or results of operations. Even if an action is not resolved against us, the uncertainty and expense associated with litigation could harm our business, financial condition and reputation, as litigation is often costly, time- consuming and disruptive to business operations. The defense of our existing and potential future lawsuits could also result in diversion of our management' s time and attention away from business operations, which could harm our business. We ~~have experienced changes to our senior leadership team, which creates uncertainty and could harm our business. We have experienced changes to our senior leadership team over the past year. Our former President and Chief Executive Officer, Dr. J. Joseph Kim, who served in those roles since 2009, resigned in May 2022, and Dr. Jacqueline Shea, previously our Chief Operating Officer, was appointed to those roles. Although Dr. Shea has served with our Company since 2019, the management transition had the potential to create uncertainty and disrupt our operations and relationships with employees, suppliers and partners and result in operational inefficiencies, decreased employee morale and productivity and increased turnover. Any departure at a senior level could be particularly disruptive given that we are already experiencing leadership transitions and, to the extent we experience additional turnover, competition for top management is high such that it may take some time to find a candidate that meets our requirements. In addition, our competitors may seek to use this management transition and the related~~

~~potential disruptions to gain a competitive advantage over us. If we are unable to successfully navigate the transition of our chief executive officer, our business could suffer. We~~ depend upon key personnel who may terminate their employment with us at any time and we may need to hire additional qualified personnel in order to obtain financing, pursue collaborations or develop or market our DNA medicine candidates. The success of our business strategy will depend to a significant degree upon the continued services of key management, technical and scientific personnel and our ability to attract and retain additional qualified personnel and managers, including personnel with expertise in clinical trials, government regulation, manufacturing, marketing and other areas. Competition for qualified personnel is intense among companies, academic institutions and other organizations. If we are unable to attract and retain key personnel and advisors, it may negatively affect our ability to successfully develop, test, commercialize and market our products and DNA medicine candidates. Our business could be adversely affected by the effects of health epidemics ~~, including the global COVID- 19 pandemic~~ . In response to the COVID- 19 pandemic, in 2020 a number of governmental orders and other public health guidance measures were implemented across much of the United States, including in the locations of our offices, laboratories, clinical trial sites and third parties on whom we rely. As a result, our expected clinical development timelines were negatively impacted. ~~These or similar~~ **Similar** events could result in future business and manufacturing disruption, or in reduced operations, any of which would materially affect our business, financial condition and results of operations. The COVID- 19 pandemic also caused supply chain disruptions and supply shortages globally. As a result, we experienced delays and disruptions in obtaining clinical supplies, manufacturing supplies and components, and had to secure new vendors for certain supplies and components at higher prices. There can be no assurance that we will not encounter similar difficulties in the future. ~~The spread of COVID- 19, which caused a broad impact globally, could also affect us economically. While the potential economic impact brought by COVID- 19 may be difficult to assess or predict, it has resulted in significant disruption of global financial markets, which could reduce our ability to access capital. Although we raised significant funds from the sale of our common stock in the public markets during the pandemic, there can be no guarantee that we will be able to continue to so, which could negatively affect our future liquidity.~~ Future health epidemics could adversely affect our clinical trial operations, including our ability to initiate and conduct our planned trials on their expected timelines and to recruit and retain participants and principal investigators and site staff who, as healthcare providers, may have heightened exposure if an outbreak occurs in their geography. Trial participants may not be able to or may not feel safe going into healthcare facilities, which is necessary for the collection and completion of data samples for our clinical trials. Further, future epidemics could also result in delays in our clinical trials due to prioritization of hospital resources toward the disease, restrictions in travel, potential unwillingness of participants to enroll in trials, participants withdrawing from trials following enrollment as a result of contracting disease or other health conditions. In addition, we rely on independent clinical investigators, contract research organizations and other third- party service providers to assist us in managing, monitoring and otherwise carrying out our preclinical studies and clinical trials, and the outbreak may affect their ability to devote sufficient time and resources to our programs or to travel to sites to perform work for us. We face intense and increasing competition and steps taken by our competitors such as the introduction of a new, disruptive technology may impede our ability to ~~successfully~~ **develop and** commercialize our DNA medicines ~~, if approved~~ . If any of our competitors develop products with efficacy or safety profiles significantly better than our product candidates and introduce new, disruptive technology, we may not be able to **complete the development of or** commercialize our ~~products~~ **product candidates** ~~, if approved~~ , and sales of any ~~of our~~ commercialized products could be harmed. Some of our competitors and potential competitors have substantially greater product development capabilities and financial, scientific, marketing and human resources than we do. Competitors may develop products earlier, obtain FDA approvals for products more rapidly, or develop products that are more effective than those under development by us. We will seek to expand our technological capabilities to remain competitive; however, research and development by others may render our technologies or product candidates obsolete or **non-** ~~noncompetitive~~ **competitive** , or result in treatments or cures superior to ours. Our competitors and potential competitors include large pharmaceutical companies broadly engaged in vaccine / immunotherapy research and development, such as Janssen Pharmaceuticals (part of J & J), Sanofi- Aventis, GlaxoSmithKline ~~plc~~ , Merck, Pfizer, Roche, AbbVie, Novartis, Bristol- Myers Squibb, and AstraZeneca, as well as various development- stage biotechnology companies involved in different vaccine and immunotherapy technologies, such as CureVac, Dynavax, Genexine, Hookipa, Iovance, Nektar, Nykode, Precigen, ~~Translate Bio,~~ Zydus, and Vir Biotechnology. These companies have significantly greater financial and other resources and greater expertise than us in research and development, securing government contracts and grants to support research and development efforts, manufacturing, preclinical and clinical testing, obtaining regulatory approvals and marketing. This may make it easier for them to respond more quickly than us to new or changing opportunities, technologies or market needs. Many of these competitors operate large, well- funded research and development programs and have significant products approved or in development. Merck and GlaxoSmithKline have commercialized preventive vaccines against HPV to protect against cervical cancer. Some companies are seeking to treat early HPV infections or low- grade cervical dysplasia. Loop Electrosurgical Excision Procedure, commonly known as LEEP, is a surgical procedure and is the current standard of care for treating high- grade cervical dysplasia. In RRP caused by HPV subtypes 6 and 11, Precigen is ~~working to develop~~ **developing** a **potential** treatment **for RRP** based on a gorilla adenovirus vector **and has publicly stated its plans to submit a BLA in 2024 based on a completed Phase 1 / 2 study. As a result, Precigen could receive marketing approval for its RRP product candidate before we can obtain regulatory approval for INO- 3107, which could put us at a competitive disadvantage in this indication** . Advaxis, Genexine, and Gilead Sciences have therapeutic cervical cancer product candidates under development. Many companies are pursuing different approaches to pre- cancers and cancers we are targeting. We also compete more specifically with companies seeking to utilize antigen-encoding DNA delivered with electroporation or other delivery technologies such as viral vectors or lipid vectors to induce in vivo generated antigen production and immune responses to prevent or treat various diseases. Small biotechnology companies may also prove to be significant competitors, particularly through collaborative arrangements with large pharmaceutical

companies or through acquisition or development of intellectual property rights. Our potential competitors also include academic institutions, governmental agencies and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for product and clinical development and marketing. Research and development by others may seek to render our technologies or products obsolete or noncompetitive. ~~See " Business — Competition " for additional information on our competitive landscape.~~ Our failure to successfully acquire, develop and market additional product candidates or approved products would impair our ability to grow. We may acquire, in- license, develop and / or market additional products and product candidates. The success of these actions depends partly upon our ability to identify, select and acquire promising product candidates and products. The process of proposing, negotiating and implementing a license or acquisition of a product candidate or approved product is lengthy and complex. Other companies, including some with substantially greater financial, marketing and sales resources, may compete with us for the license or acquisition of product candidates and approved products. We have limited resources to identify and execute the acquisition or in- licensing of third- party products, businesses and technologies and integrate them into our current infrastructure. Moreover, we may devote resources to potential acquisitions or in- licensing opportunities that are never completed, or we may fail to realize the anticipated benefits of such efforts. We may not be able to acquire the rights to additional product candidates on terms that we find acceptable, or at all. In addition, future acquisitions may entail numerous operational and financial risks, including: • exposure to unknown liabilities; • disruption of our business and diversion of our management' s time and attention to develop acquired products or technologies; • incurrence of substantial debt or dilutive issuances of securities to pay for acquisitions; • higher than expected acquisition and integration costs; • increased amortization expenses; • difficulty and cost in combining the operations and personnel of any acquired businesses with our operations and personnel; • impairment of relationships with key suppliers or customers of any acquired businesses due to changes in management and ownership; and • inability to retain key employees of any acquired businesses. Further, any product candidate that we acquire may require additional development efforts prior to commercial sale, including extensive clinical testing and approval by the FDA and applicable foreign regulatory authorities. All product candidates are prone to risks of failure typical of product development, including the possibility that a product candidate will not be shown to be sufficiently safe and effective for approval by regulatory authorities. Changes in funding for the FDA and other government agencies could prevent new products from being developed or commercialized in a timely manner, which could negatively impact our business. The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels, ability to hire and retain key personnel and accept the payment of user fees, and statutory, regulatory, and policy changes. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable. Disruptions at the FDA and other agencies may also slow the time necessary for new drugs to be reviewed and / or approved by necessary government agencies, which would adversely affect our business. For example, in recent years, ~~including for 35 days from December 2018 to January 2019,~~ the U. S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA employees and stop critical activities. If a prolonged government shutdown occurs, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business. **If our** ~~We are dependent on~~ information technology ~~and our~~ systems ~~and infrastructure face certain risks~~ **or those of third parties upon which we rely or our data, are or were compromised, we could experience adverse consequences resulting from such compromise** , including ~~from cybersecurity breaches~~ **but not limited to, regulatory investigations** and ~~data leakage~~ **actions; litigation; fines and penalties; disruptions of our business operations; reputational harm; loss of revenue and profits; and other adverse consequences** . We rely to a large extent upon sophisticated information technology systems to operate our businesses, some of which are managed, hosted provided and / or used for third- parties or their vendors. We collect, store and transmit large amounts of confidential **, proprietary or otherwise sensitive** information (including personal information and pseudonymized information), and we deploy and operate an array of technical and procedural controls **designed** to maintain the confidentiality **, availability** and integrity of such ~~confidential~~ information **as appropriate** . A significant breakdown, invasion, corruption, destruction, interruption, or unavailability of critical information technology systems or infrastructure, by our workforce, others with authorized access to our systems or unauthorized persons could negatively impact operations. Hardware, software, or applications we develop or obtain from third parties may contain defects in design or manufacture or other supply chain problems that could unexpectedly compromise our information and network security. The ever- increasing use and evolution of technology, including cloud- based computing, creates opportunities for the **compromise** ~~unintentional dissemination or intentional destruction~~ of ~~confidential~~ information stored in our or our third- party providers' systems, portable media or storage devices. **Cyber- attacks, malicious internet- based activity, online and offline fraud and other similar activities threaten our information and information technology systems and those of third parties upon which we rely. Such threats are prevalent and continue to rise, are increasingly difficult to detect and come from a variety of sources such as traditional computer " hackers, " threat actors, " hactivists, " organized criminal threat actors, personnel (such as through error or malfeasance), sophisticated national states and nation- state support actors (for example, in conjunction with military conflicts). During times of war and other major conflicts, we may be vulnerable to a heightened risk of these attacks.** We ~~could also experience~~ **and the third parties upon which we rely are subject to** a **variety of evolving threats, including but not limited to:** business interruption, **loss of information,** theft of ~~confidential~~ information or reputational damage from industrial espionage attacks, malware or other cyber- attacks (including ransomware), **social- engineering attacks (including through deep fakes and phishing attacks), malicious code (such as viruses and worms), denial- of- service attacks, credential stuffing attacks, credential harvesting, personnel misconduct or error, supply- chain attacks, software bugs, server malfunctions, software or hardware failures, telecommunications failures, natural disasters, and other similar threats, any of** which may compromise our system infrastructure or lead to data

~~leakage~~ **compromise. In particular** , ~~either internally~~ **severe ransomware attacks are becoming increasingly prevalent and can lead to significant interruptions in** ~~or~~ **our** ~~at~~ **operations, loss of data, reputational harm and diversion of funds. Extortion payments may alleviate some of the negative impact of a ransomware attack but we may be unwilling** ~~our~~ **or unable to make such payments. Remote work has also become more common and increased risks to our information technology systems and data. 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 resent in acquired or integrated entities' systems and technologies. Furthermore, we may discover security issues that were not found during diligence of such acquired or integrated entities and it may be difficult to integrate such entities into our programs. We rely on service providers and** third- party **technologies to operate critical business systems to process sensitive information in a variety of contexts, including without limitation, cloud- based infrastructure, personnel email, data hosting, and other functions. Our ability to monitor these third parties' information security practices is limited and these service** providers **may not have adequate information security measures in place. If our service providers experience a security incident or other interruption, we could experience adverse consequences** . While we **may be entitled to damages if our service providers fail to satisfy their privacy or security- related obligations to us, any aware may be insufficient or we may be unable to recover such award. While we** have ~~invested in the~~ **implemented measures designed to** ~~protection~~ --- **protect** ~~of~~ **our** data and information technology **systems** , there can be no assurance that our efforts will **be effective (including, without limitation** prevent service interruptions or security ~~breaches~~ **incidents). We take steps designed to detect, mitigate and remediate vulnerabilities in our information systems (such as our hardware and software, including that of third parties upon which we rely). We may not, however, detect and remediate all such vulnerabilities on a timely or effective basis. Vulnerabilities could be exploited and result in a security incident** . Any such interruption or breach of our systems could adversely affect our business operations and / or result in the loss of critical or sensitive confidential information or intellectual property, and could result in financial, legal, business and reputational harm to us. In addition, as the regulatory environment related to information security, data collection and use, and privacy becomes increasingly rigorous, with new and constantly changing requirements applicable to our business, compliance with those requirements could also result in additional costs. We **may expend significant resources or modify our business activities (including our clinical trial activities) to try to protect against security incidents. Certain data privacy and security obligations may require us to implement and maintain specific or reasonable security measures. Applicable data privacy and security obligations may require us to notify relevant stakeholders, including affected individuals, regulators, and other stakeholders of security incidents. Such disclosures are costly, and the disclosure or the failure to comply with such requirements could lead to adverse consequences. If we (or a third party upon whom we rely) experience a security incident or are perceived to have experienced a security incident, we may experience adverse consequences, such as government enforcement actions (for example, investigations, fines, penalties, audits, and inspections); additional reporting requirements and / or oversight; restrictions on processing sensitive information (including personal data); litigation (including class claims); indemnification obligations; negative publicity; reputational harm; monetary fund diversions; diversion of management attention; interruptions in our operations (including availability of data); financial loss; and other similar harms. We cannot be sure that our insurance coverage will be adequate or sufficient to protect us from or to mitigate liabilities arising out of our privacy and security practices, that such coverage will continue to be available on commercially reasonable terms or at all, or that such coverage will pay future claims. We** face potential product liability exposure and, if successful claims are brought against us, we may incur substantial liability. The use of our proprietary ~~smart~~ device and DNA medicine candidates in clinical trials and the sale of any products for which we obtain marketing approval expose us to the risk of product liability claims. Product liability claims might be brought against us by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with our products. For example, pharmaceutical companies have been subject to claims that the use of some pediatric vaccines has caused personal injuries, including brain damage, central nervous system damage and autism, and these companies have incurred material costs to defend these claims. If we cannot successfully defend ourselves against product liability claims, we could incur substantial liabilities. In addition, regardless of merit or eventual outcome, product liability claims may result in: • decreased demand for our DNA medicine candidates; • impairment of our business reputation; • withdrawal of clinical trial participants; • costs of related litigation; • distraction of management' s attention from our primary business; • substantial monetary awards to patients or other claimants; • loss of revenues; and • inability to commercialize our products. We have obtained product liability insurance coverage for our clinical trials, but our insurance coverage may not be sufficient to reimburse us for any expenses or losses we may suffer. Moreover, insurance coverage is becoming increasingly expensive, and, in the future, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. On occasion, large judgments have been awarded in class action lawsuits based on products that had unanticipated side effects. A successful product liability claim or series of claims brought against us could cause our stock price to decline and, if judgments exceed our insurance coverage, could adversely affect our business. Healthcare reform measures could hinder or prevent our products' commercial success. In both the United States and certain foreign jurisdictions there have been, and we anticipate there will continue to be, a number of legislative and regulatory changes to the healthcare system that could impact our ability to sell any of our products profitably. In the United States, the federal government enacted healthcare reform legislation, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the ACA. **The** ~~Among the~~ ACA **, among other things, increased the minimum level of Medicaid rebates payable by manufacturers of brand name drugs; required collection of rebates for drugs paid by Medicaid managed care organizations; required manufacturers to participate in a coverage gap discount program, under which they must agree to offer point- of- sale discounts (increased to 70 percent, effective as of January 1, 2019) off negotiated prices of**

**applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer** ' s **outpatient drugs** ~~provisions of importance~~ to **be covered under Medicare Part D;** ~~the pharmaceutical industry are that it: •~~ imposed ~~an~~ **a non- deductible** annual ~~excise tax of 2. 3 % on any entity that manufactures or imports medical devices offered for sale in the United States, with limited exceptions, although the effective rate paid may be lower. However, the 2020 federal spending package permanently eliminated, effective January 1, 2020, this ACA- mandated medical device tax; • created an annual, nondeductible~~ fee on **pharmaceutical** ~~any entity that manufactures~~ **manufacturers** or ~~imports~~ **importers who sell** certain ~~specified~~ **"** branded prescription drugs **"** ~~and biologic agents apportioned among these entities according~~ to **specified federal** ~~their market share in some~~ government ~~healthcare~~ programs ~~; • increased the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program~~ , **implemented a** ~~to 23. 1 % and 13 % of the average manufacturer price for most branded and generic drugs, respectively and capped the total rebate amount for innovator drugs at 100 % of the Average Manufacturer Price, or AMP; • created~~ new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for ~~certain~~ drugs ~~and biologics~~ that are inhaled, infused, instilled, implanted **,** or injected **expanded the types of entities eligible for the 340B drug discount program** ; ~~•~~ expanded eligibility criteria for Medicaid programs ~~by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133 % of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability~~ ; ~~• expanded the entities eligible for discounts under the Public Health program; •~~ created a new Patient- Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; ~~•~~ **and** established a Center for Medicare ~~&~~ ~~Medicaid~~ Innovation at ~~the Centers for Medicare & Medicaid Services, or~~ CMS ~~,~~ to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending ~~; and • created a licensure framework for follow on biologic products~~ . There have been executive, judicial, and Congressional challenges to certain aspects of the ACA. While Congress has not passed comprehensive repeal legislation, it has enacted laws that modify certain provisions of the ACA such as removing penalties for not complying with the ACA' s individual mandate to carry qualifying health insurance coverage for all or part of a year. In addition, the ACA- mandated " Cadillac " tax on high- cost employer- sponsored health coverage was eliminated, along with the health insurer tax. On June 17, 2021 the U. S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the " individual mandate " was repealed by Congress. On August 16, 2022, President Biden signed the Inflation Reduction Act of 2022, or IRA, into law, which among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in ACA marketplaces through plan year 2025. The IRA also eliminates the" donut hole" under the Medicare Part D program beginning in 2025 by significantly lowering the beneficiary maximum out- of- pocket cost and creating a new manufacturer discount program. It is unclear how such challenges, and the healthcare reform measures of the Biden administration will impact the ACA and our business. Additionally, on March 11, 2021, President Biden signed the American Rescue Plan Act of 2021 into law, which eliminates the statutory Medicaid drug rebate cap, currently set at 100 % of a drug' s average manufacturer price, for single source and innovator multiple source drugs, beginning January 1, 2024. In addition, other legislative changes have been proposed and adopted since the ACA was enacted. The Budget Control Act of 2011 included reductions to Medicare payments to providers of 2 % per fiscal year, which, due to subsequent legislative amendments to the statute will remain in effect until ~~2031~~ **2032** , unless Congressional action is taken ~~. Under current legislation the actual reduction in Medicare payments will vary from 1 % in 2022 to up to 4 % in the final fiscal year of this sequester~~ . The American Taxpayer Relief Act of 2012 reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. There has also been heightened governmental scrutiny in the United States of pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. Such scrutiny has resulted in several recent Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products. For example, at the federal level, in July 2021, the Biden administration released an executive order, " Promoting Competition in the American Economy, " with multiple provisions aimed at prescription drugs. In response to Biden' s executive order, on September 9, 2021, HHS released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and sets out a variety of potential legislative policies that Congress could pursue as well as potential administrative actions HHS can take to advance these principles. In addition, the IRA, among other things (i) directs HHS to negotiate the price of certain high- expenditure, single- source drugs and biologics covered under Medicare and (ii) imposes rebates under Medicare Part B and Medicare Part D to penalize price increases that outpace inflation. These provisions ~~will~~ take effect progressively starting in fiscal year 2023 **. On August 29, 2023, HHS announced the list of the first ten drugs that will be subject to price negotiations** , although ~~they~~ **the** ~~may be~~ **Medicare drug price negotiation program is currently** subject to legal challenges. It is currently unclear how the IRA will be implemented but it is likely to have a significant impact on the pharmaceutical industry. In ~~addition,~~ **response to** the Biden administration ~~released an additional~~ **' s October 2022** executive order **,** on ~~October~~ **February** 14, ~~2022~~ **2023** , ~~directing~~ HHS ~~to~~ **released a** report **outlining** ~~on how the~~ **three** ~~Center for Medicare and Medicaid Innovation can be further leveraged to test~~ new models for **testing by the CMS Innovation Center which will be evaluated on their ability to** ~~lowering~~ **lower** ~~drug~~ **the** ~~costs~~ **cost** ~~for Medicare~~ **of drugs, promote accessibility, and improve quality of care. It is unclear whether the models will be utilized in any health reform measures in the future. Further, on December 7, 2023, the Biden administration announced** ~~and~~ **an** ~~Medicaid beneficiaries~~ **initiative to control the price of prescription drugs through the use of march- in rights under the Bayh- Dole Act. On December 8, 2023, the National Institute of Standards and Technology published for comment a Draft Interagency Guidance Framework for Considering the Exercise of March- In Rights which for the first time includes the price of a product as one factor an agency can use when deciding to**

**exercise march- in rights. While march- in rights have not previously been exercised, it is uncertain if that will continue under the new framework** . At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to make and implement healthcare reforms may adversely affect: • our ability to set a price we believe is fair for our products; • our ability to generate revenues and achieve or maintain profitability; • the availability of capital; and • our ability to obtain timely approval of our products. If we fail to comply with applicable healthcare regulations, we could face substantial penalties and our business, operations and financial condition could be adversely affected. Certain federal, state, local and foreign healthcare laws and regulations pertaining to fraud and abuse, transparency, patients' rights, and privacy are applicable to our business. The laws that may affect our ability to operate include: • the federal healthcare program Anti- Kickback Statute, which prohibits, among other things, people from soliciting, receiving or providing remuneration, directly or indirectly, to induce or reward either the referral of an individual, or ordering, or leasing of an item, good, facility or service, for which payment may be made by a federal healthcare program such as Medicare or Medicaid. The intent standard under the federal healthcare program Anti- Kickback Statute was amended by the ACA to a stricter standard such that 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. Further, the ACA codified case law that a claim including items or services resulting from a violation of the federal healthcare program Anti- Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act; • federal civil and criminal false claims laws, including the civil False Claims Act, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid, or other third- party payors that are false or fraudulent; • HIPAA, which prohibits, among other things, executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters. Similar to the federal healthcare program 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, and related regulations, which impose certain requirements relating to the privacy, security and transmission of individually identifiable health information on certain individuals and entities; • the Physician Payments Sunshine Act, created under the ACA, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children' s Health Insurance Program, with certain exceptions, to report annually to CMS, information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists, and chiropractors), other healthcare professionals (such as physicians assistants and nurse practitioners) and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members; • the FDCA, which among other things, strictly regulates drug product marketing, prohibits manufacturers from marketing drug products for off- label use and regulates the distribution of drug samples; • the U. S. Foreign Corrupt Practices Act, which, among other things, prohibits companies issuing stock in the U. S. from bribing foreign officials for government contracts and other business; • state law equivalents of each of the above federal laws, such as anti- kickback and false claims laws which may apply to items or services reimbursed by any third- party payor, including commercial insurers, state and local laws requiring the registration of pharmaceutical sales and medical representatives, and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts; and • additional state and local laws such as laws in California and Massachusetts, which mandate implementation of compliance programs, compliance with industry ethics codes, and spending limits, and other state and local laws, such as laws in Vermont, Maine, and Minnesota which require reporting to state governments of gifts, compensation, and other remuneration to physicians. The shifting regulatory environment, along with the requirement to comply with multiple jurisdictions with different compliance and / or reporting requirements, increases the possibility that a company may run afoul of one or more laws. We will be required to spend substantial time and money to ensure that our business arrangements with third parties comply with applicable healthcare laws and regulations. Because of the breadth of these laws and the narrowness of the statutory exceptions and regulatory safe harbors available, which require strict compliance in order to offer protection, it is possible that governmental authorities may conclude that our business practices do not comply with current or future statutes, regulations, agency guidance or case law involving applicable healthcare laws. If our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to significant penalties, including administrative, civil and criminal penalties, damages, fines, disgorgement, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, imprisonment, integrity and / or other oversight obligations, contractual damages, reputational harm, and the curtailment or restructuring of our operations. Any such penalties could adversely affect our ability to operate our business and our financial results. Any action against us for violation of these laws, 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. Our business involves the use of hazardous materials and we and our third- party manufacturers must comply with environmental laws and regulations, which can be expensive and restrict how we do business. Our and our third- party manufacturers' activities involve the controlled storage, use and disposal of hazardous materials, including the components of our DNA medicine candidates and other hazardous compounds. We and our manufacturers are subject to federal, state and local laws and regulations governing the use, manufacture, storage, handling and disposal of these hazardous materials. In the event of an accident, state or federal authorities may curtail the use of these materials and interrupt our business operations. If we are subject to any liability as a result of our or our third- party manufacturers' activities involving hazardous materials, our business and financial condition may be adversely affected. We have entered into collaborations with

Chinese companies and ~~conduct certain research and~~ **rely on clinical materials manufactured in China for our** development **efforts** ~~activities in China~~ . Uncertainties regarding the interpretation and enforcement of Chinese laws, rules and regulations, a trade war, political unrest or unstable economic conditions in China could materially adversely affect our business, financial condition and results of operations. We are party to a license and collaboration agreement with a China- based company **,** ApolloBio, pursuant to which ApolloBio has the exclusive right to develop and commercialize VGX- 3100 in China, Hong Kong, Macao and Taiwan. The Chinese legal system is a civil law system based on written statutes. Unlike the common law system, prior court decisions may be cited for reference but have limited precedential value. In addition, the Chinese legal system is based in part on government policies and internal rules, some of which are not published on a timely basis or at all, and which may have a retroactive effect. As a result, we may not be aware of our violation of these policies and rules until after the occurrence of the violation. Any administrative and court proceedings in China may be protracted, resulting in substantial costs and diversion of resources and management attention. Because Chinese administrative and court authorities have significant discretion in interpreting and implementing statutory and contractual terms, it may be more difficult to evaluate the outcome of administrative and court proceedings and the level of legal protection we enjoy than in more developed legal systems. Furthermore, we are exposed to the possibility of disruption of our research and development activities in the event of changes in the policies of the United States or Chinese governments, political unrest or unstable economic conditions in China. For example, China' s" zero COVID" policy ~~has~~ caused delays in Advaccine' s conduct of clinical trials for INO- 4800 in China under our collaboration with them, which ~~has~~ in turn resulted in delays in obtaining clinical data to evaluate the safety and potential efficacy of INO- 4800. ~~Further~~ **In addition** , **the biopharmaceutical industry in China is strictly regulated by the Chinese government. Changes to Chinese regulations or government policies affecting biopharmaceutical companies are unpredictable and may have a material adverse effect on ApolloBio or Advaccine, which could have an adverse effect on our business, financial condition, results of operations and prospects. Evolving changes in China' s public health, economic, political, and social conditions and the uncertainty around China' s relationship with other governments, including** the threat of a trade war between the United States and China **,** could lead to supply chain disruptions or increased costs for clinical materials manufactured in China that are necessary for our development efforts. These interruptions or failures could then impede commercialization of our DNA medicine candidates and impair our competitive position. We may also be exposed to fluctuations in the value of the local currency in China. These uncertainties may impede our ability to enforce the contracts we have entered into and our ability to continue our research and development activities and could materially and adversely affect our business, financial condition and results of operations. Our employees, principal investigators, and consultants may engage in misconduct or other improper activities, including non- compliance with regulatory standards and requirements and insider trading. We are exposed to the risk of fraud or other misconduct by our employees, principal investigators, and consultants. Misconduct by these parties could include intentional failures to comply with FDA regulations or the regulations applicable in the EU and other jurisdictions; provide accurate information to the FDA, the EMA, and other regulatory authorities; comply with healthcare fraud and abuse laws and regulations in the United States and abroad; or report financial information or data accurately or disclose unauthorized activities to us. Such misconduct also could involve the improper use of information obtained in the course of clinical trials or interactions with the FDA or other regulatory authorities, which could result in regulatory sanctions and cause serious harm to our reputation. Sales, marketing, and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self- dealing, and other abusive practices. These laws and regulations restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs, and other business arrangements. We have adopted a code of conduct applicable to all of our employees, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from government investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. 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, financial condition, results of operations, and prospects, including the imposition of significant fines or other sanctions. Employee litigation and unfavorable publicity could negatively affect our future business. Our employees may, from time to time, bring lawsuits against us regarding injury, creating a hostile work place, discrimination, wage and hour disputes, sexual harassment, or other employment issues. In recent years there has been an increase in the number of discrimination and harassment claims generally. Coupled with the expansion of social media platforms and similar devices that allow individuals access to a broad audience, these claims have had a significant negative impact on some businesses. Certain companies that have faced employment- or harassment- related lawsuits have had to terminate management or other key personnel, and have suffered reputational harm that has negatively impacted their business. If we were to face any employment- related claims, our business could be negatively affected. Risks Related to Our Intellectual Property It is difficult and costly to generate and protect our intellectual property and our proprietary technologies, and we may not be able to ensure their protection. Our commercial success will depend in part on obtaining and maintaining patent, trademark, trade secret, and other intellectual property protection relating to our proprietary ~~smart~~ device and DNA medicine candidates, as well as successfully defending these intellectual property rights against third- party challenges. The patent positions of pharmaceutical and biotechnology companies can be highly uncertain and involve complex legal and factual questions for which important legal principles remain unresolved. The laws and regulations regarding the breadth of claims allowed in biotechnology patents have evolved over recent years and continues to undergo review and revision, both in the United States and abroad. The biotechnology patent situation outside the United States can be even more uncertain depending on the country. Changes in either the patent laws or in interpretations of patent laws in the United States and other countries may diminish the value of our intellectual property. Accordingly, we cannot predict the breadth of claims that may be allowed or enforced in our licensed patents, our patents or in third- party patents, nor can we predict the likelihood

of our patents surviving a patent validity challenge. The degree of future protection for our intellectual property rights is uncertain, because legal decision- making can be unpredictable, thereby often times resulting in limited protection, which may not adequately protect our rights or permit us to gain or keep our competitive advantage, or resulting in an invalid or unenforceable patent. For example: • we, or the parties from whom we have acquired or licensed patent rights, may not have been the first to file the underlying patent applications or the first to make the inventions covered by such patents; • the named inventors or co- inventors of patents or patent applications that we have licensed or acquired may be incorrect, which may give rise to inventorship and ownership challenges; • others may develop similar or alternative technologies, or duplicate any of our products or technologies that may not be covered by our patents, including design- arounds; • pending patent applications may not result in issued patents; • the issued patents covering our products and technologies may not provide us with any competitive advantages or have any commercial value; • the issued patents may be challenged and invalidated, or rendered unenforceable; • governments in the United States or abroad may prevent us from enforcing patents on our vaccines, which could prevent us from excluding competitors from those markets; • the issued patents may be subject to reexamination, which could result in a narrowing of the scope of claims or cancellation of claims found unpatentable; • we may not develop or acquire additional proprietary technologies that are patentable; • our trademarks may be invalid or subject to a third party' s prior use; or • our ability to enforce our patent rights will depend on our ability to detect infringement, and litigation to enforce patent rights may not be pursued due to significant financial costs, diversion of resources, and unpredictability of a favorable result or ruling. We depend, in part, on our licensors and collaborators to protect a portion of our intellectual property rights. In such cases, our licensors and collaborators may be primarily or wholly responsible for the maintenance of patents and prosecution of patent applications relating to important areas of our business. If any of these parties fail to adequately protect these products with issued patents, our business and prospects would be harmed significantly. We also may rely on trade secrets to protect our technology, especially where we do not believe patent protection is appropriate or obtainable. However, trade secrets are difficult to protect. Although we use reasonable efforts to protect our trade secrets, our employees, consultants, contractors, outside scientific collaborators and other advisors may unintentionally or willfully disclose our trade secrets to competitors. Enforcing a claim that a third- party entity illegally obtained and is using any of our trade secrets is expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the United States are sometimes less willing to protect trade secrets. Moreover, our competitors may independently develop equivalent knowledge, methods and know- how. If we or our licensors fail to obtain or maintain patent protection or trade secret protection for our DNA medicine candidates or our technologies, third parties could use our proprietary information, which could impair our ability to compete in the market and adversely affect our ability to generate revenues and attain profitability. From time to time, U. S. and other policymakers have proposed reforming the patent laws and regulations of their countries. In September 2011 the America Invents Act (the Act) was signed into law. The Act changed the current " first- to- invent " system to a system that awards a patent to the " first- inventor- to- file " for an application for a patentable invention. The Act also created a procedure to challenge newly issued patents in the patent office via post- grant proceedings and new inter parties reexamination proceedings. These changes may make it easier for competitors to challenge our patents, which could result in increased competition and have a material adverse effect on our product sales, business and results of operations. The changes may also make it harder to challenge third- party patents and place greater importance on being the first inventor to file a patent application on an invention. If we are sued for infringing intellectual property rights of third parties, it will be costly and time- consuming, and an unfavorable outcome in that litigation would have a material adverse effect on our business. Other companies may have or may acquire intellectual property rights that could be enforced against us. If they do so, we may be required to alter our technologies, pay licensing fees or cease activities. If our products or technologies infringe the intellectual property rights of others, they could bring legal action against us or our licensors or collaborators claiming damages and seeking to enjoin any activities that they believe infringe their intellectual property rights. Because patent applications can take many years to issue, and there is a period when the application remains undisclosed to the public, there may be currently pending applications unknown to us or reissue applications that may later result in issued patents upon which our products or technologies may infringe. There could also be existing patents of which we are unaware that our products or technologies may infringe. In addition, if third parties file patent applications or obtain patents claiming products or technologies also claimed by us in pending applications or issued patents, we may have to participate in interference or derivation proceedings in the United States Patent and Trademark Office to determine priority or derivation of the invention. If third parties file oppositions in foreign countries, we may also have to participate in opposition proceedings in foreign tribunals to defend the patentability of our filed foreign patent applications. If a third party claims that we infringe its intellectual property rights, it could cause our business to suffer in a number of ways, including: • we may become involved in time- consuming and expensive litigation, even if the claim is without merit, the third party' s patent is invalid or we have not infringed; • we may become liable for substantial damages for past infringement if a court decides that our technologies infringe upon a third party' s patent; • we may be enjoined by a court to stop making, selling or licensing our products or technologies without a license from a patent holder, which may not be available on commercially acceptable terms, if at all, or which may require us to pay substantial royalties or grant cross- licenses to our patents; and • we may have to redesign our products so that they do not infringe upon others' patent rights, which may not be possible or could require substantial investment or time. If any of these events occur, our business could suffer and the market price of our common stock may decline. We have not yet registered our trademarks in all of our potential markets, and failure to secure those registrations could adversely affect our business. Our trademark applications may not be allowed for registration, and our registered trademarks may not be maintained or enforced. During trademark registration proceedings, we may receive rejections. Although we are given an opportunity to respond to those rejections, we may be unable to overcome such rejections. In addition, in the USPTO and in comparable agencies in many foreign jurisdictions, third parties are given an opportunity to oppose pending trademark applications and to seek to cancel registered trademarks. Opposition or cancellation proceedings may be filed against our trademarks, and our

trademarks may not survive such proceedings. If we do not secure registrations for our trademarks, we may encounter more difficulty in enforcing them against third parties than we otherwise would. Risks Related to an Investment in Our Common Stock An active trading market for our common stock may not be sustained. Although our common stock is listed on the Nasdaq **Capital** ~~Global Select~~ Market, we cannot be certain that an active trading market for our shares will continue to be sustained. If an active market for our common stock is not sustained, it may be difficult for investors in our common stock to sell shares without depressing the market price for the shares or to sell the shares at all. The price of our common stock has been and may continue to be volatile, and an investment in our common stock could decline substantially in value. In light of our small size and limited resources, as well as the uncertainties and risks that can affect our business and industry, our stock price has been and may continue to be highly volatile and has been and may in the future be subject to substantial drops, with or even in the absence of news affecting our business. Period to period comparisons are not indicative of future performance. The following factors, which are not exhaustive, in addition to the other risk factors described in this report, and the potentially low volume of trades in our common stock, may have a significant impact on the market price of our common stock, some of which are beyond our control: • developments concerning any research and development, clinical trials, manufacturing, and marketing efforts or collaborations; • fluctuating public or scientific interest in the potential for our vaccines or other DNA medicine candidates; • our announcement of significant acquisitions, strategic collaborations, joint ventures or capital commitments; • fluctuations in our operating results; • announcements of technological innovations; • new products or services that we or our competitors offer; • changes in the structure of healthcare payment systems; • the initiation, conduct and / or outcome of intellectual property and / or litigation matters; • changes in financial or other estimates by securities analysts or other reviewers or evaluators of our business; • conditions or trends in bio- pharmaceutical or other healthcare industries; • regulatory developments in the United States and other countries; • perceptions of gene- based therapy; • changes in the economic performance and / or market valuations of other biotechnology and medical device companies; • additions or departures of key personnel; • sales or other transactions involving our common stock; • changes in our capital structure; • sales or other transactions by executive officers or directors involving our common stock; • changes in accounting principles; • global unrest including geopolitical risks emanating from countries such as Russia and China, terrorist activities, **the conflict between Israel** and **Hamas, bank failures, and other** economic and other external factors; and • catastrophic weather and / or global disease pandemics ~~, including COVID- 19~~ . The stock market in general can experience relatively large price and volume fluctuations from time to time. In particular, the market prices of securities of smaller biotechnology and medical device companies have experienced dramatic fluctuations that often have been unrelated or disproportionate to the operating results of these companies. Continued market fluctuations could result in extreme volatility in the price of our common stock, which could cause a decline in the value of our common stock. In addition, price volatility may increase if the trading volume of our common stock remains limited or declines. We have broad discretion in the use of our cash, cash equivalents, and investments, and may not use them effectively. Our management has broad discretion in the application of our cash, cash equivalents, and investments, and could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. For example, our operating expenses **increased significantly** ~~during the period~~ from 2020 to 2022 ~~significantly increased~~ due to development and manufacturing activities for our COVID- 19 vaccine program, for which we discontinued internal funding in the fourth quarter of 2022. We may not deploy our current capital resources effectively. The failure by our management to apply our funds effectively could result in financial losses that could have a material adverse impact on our business, cause the price of our common stock to decline, and delay the development of our ~~investigational medicines~~ **product candidates** . Pending their use, we may invest our cash, cash equivalents, and investments in a manner that does not produce income or that loses value. Anti- takeover provisions under our charter documents and Delaware law could delay or prevent a change of control which could limit the market price of our common stock. Our amended and restated certificate of incorporation contains provisions that could delay or prevent a change of control of our company or changes in our board of directors that our stockholders might consider favorable. Some of these provisions include: • the authority of our board of directors to issue shares of undesignated preferred stock and to determine the rights, preferences and privileges of these shares, without stockholder approval; • all stockholder actions must be effected at a duly called meeting of stockholders and not by written consent; and • the elimination of cumulative voting. In addition, we are governed by the provisions of Section 203 of the Delaware General Corporate Law, which may prohibit certain business combinations with stockholders owning 15 % or more of our outstanding voting stock. These and other provisions in our amended and restated certificate of incorporation, amended and restated bylaws and Delaware law could make it more difficult for stockholders or potential acquirers to obtain control of our board of directors or initiate actions that are opposed by the then- current board of directors, including to delay or impede a merger, tender offer or proxy contest involving our company. Any delay or prevention of a change of control transaction or changes in our board of directors could cause the market price of our common stock to decline. We have never paid cash dividends on our common stock and we do not anticipate paying dividends in the foreseeable future. We have paid no cash dividends on our common stock to date, and we currently intend to retain our future earnings, if any, to fund the development and growth of our business. In addition, the terms of any future debt or credit facility may preclude or limit our ability to pay any dividends. As a result, capital appreciation, if any, of our common stock will be the sole source of potential gain for the foreseeable future. Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited. Under Sections 382 and 383 of the revised Internal Revenue Code of 1986, as amended, or the Code, if a corporation undergoes an " ownership change " (generally defined as a greater than 50 percentage point change (by value) in the ownership of its equity by certain significant shareholders over a rolling three year period), the corporation' s ability to use its pre- change net operating loss carryforwards and certain other pre-change tax attributes to offset its post- change income and taxes may be limited. We may have experienced such ownership changes in the past, and we may experience ownership changes in the future as a result of shifts in our share ownership, some of which would be outside our control. If our ability to use our net operating losses and other tax attributes is limited by ownership

changes, we may be unable to utilize a material portion of our net operating losses and other tax attributes to offset our future taxable income. In addition, there is also a risk that due to changes in laws and regulations, such as alternative minimum taxes or suspensions on the use of net operating losses, or other unforeseen reasons, our existing net operating losses could expire or otherwise become unavailable to offset future income tax liabilities. General Risk Factors Our quarterly operating results may fluctuate significantly. We expect our operating results to be subject to quarterly fluctuations. Our net loss and other operating results will be affected by numerous factors, including: • variations in the level of expenses related to our proprietary ~~smart~~ device, DNA medicine candidates or future development programs; • expenses related to corporate transactions, including ones not fully completed; • addition or termination of clinical trials or funding support; • any intellectual property infringement lawsuit in which we may become involved; • any legal claims that may be asserted against us or any of our officers; • regulatory developments affecting our proprietary ~~smart~~ device and DNA medicine candidates or those of our competitors; • changes in the fair value of our investments, including investments in affiliated entities; • our execution of any collaborative, licensing or similar arrangements, and the timing of payments we may make or receive under these arrangements; and • if any of our DNA medicine candidates receive regulatory approval, the levels of underlying demand for our products. If our quarterly operating results fall below the expectations of investors or securities analysts, the price of our common stock could decline substantially. Furthermore, any quarterly fluctuations in our operating results may, in turn, cause the price of our stock to fluctuate substantially. We believe that quarterly comparisons of our financial results are not necessarily meaningful and should not be relied upon as an indication of our future performance. Our results of operations and liquidity needs could be materially affected by market fluctuations and general economic conditions. Our results of operations could be materially affected by economic conditions generally, both in the United States and elsewhere around the world. Concerns over inflation, **rising interest rates,** energy costs, geopolitical issues, global pathogen outbreaks or pandemics ~~, including COVID- 19~~ , and the availability and cost of credit have in the past and may continue to contribute to increased volatility and diminished expectations for the economy and the markets going forward. Market upheavals may have an adverse effect on us. In the event of a market downturn, our results of operations could be adversely affected. Our future cost of equity or debt capital and access to the capital markets could be adversely affected, and our stock price could decline. There may be disruption or delay in the performance of our third-party contractors and suppliers. If our contractors, suppliers and partners are unable to satisfy their contractual commitments, our business could suffer. In addition, we maintain significant amounts of cash and cash equivalents at one or more financial institutions that are in excess of federally insured limits, and we may experience losses on these deposits **. Adverse developments affecting the financial services industry, such as actual events or concerns involving liquidity, could adversely impact our business, financial condition and results of operations. Actual events involving limited liquidity or other adverse developments that affect financial institutions or other companies in the financial services industry or the financial services industry generally, or concerns or rumors about any events of these kinds or other similar risks, have in the past and may in the future lead to market- wide liquidity problems. For example, in 2023, several banking institutions were closed or seized by the Federal Deposit Insurance Corporation, leading to significant liquidity concerns in the broader financial services industry. While we did not have any deposits at any of the banks impacted by the adverse developments in 2023, we maintain deposits at financial institutions as a part of doing business that could be at risk if another similar event were to occur. Our ongoing cash management strategy is to maintain the majority of our deposit accounts in large financial institutions, but there can be no assurance this strategy will be successful. Increasing concerns regarding the U. S. or international financial systems, including bank failures and bailouts, and their potential broader effects and potential systemic risk on the banking sector generally, may adversely affect our access to capital. Any decline in available funding or access to our cash and liquidity resources could, among other risks, limit our ability to meet our capital needs and fund future growth 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 business, financial condition and results of operations** . If equity research analysts do not publish research or reports, or publish unfavorable research or reports, about us, our business or our market, our stock price and trading volume could decline. The trading market for our common stock is influenced by the research and reports that equity research analysts publish about us and our business, and we have limited research coverage by equity research analysts. Equity research analysts may elect not to initiate or continue to provide research coverage of our common stock, and such lack of research coverage may adversely affect the market price of our common stock. Even if we have equity research analyst coverage, we will not have any control over the analysts or the content and opinions included in their reports. The price of our stock could decline if one or more equity research analysts downgrade our stock or issue other unfavorable commentary or research. If one or more equity research analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which in turn could cause our stock price or trading volume to decline. The issuance of additional stock in connection with financings, acquisitions, investments, our stock incentive plans or otherwise will dilute all other stockholders. Our certificate of incorporation authorizes us to issue up to 600, 000, 000 shares of common stock and up to 10, 000, 000 shares of preferred stock with such rights and preferences as may be determined by our board of directors. Subject to compliance with applicable rules and regulations, we may issue our shares of common stock or securities convertible into our common stock from time to time in connection with a financing, acquisition, investment, our stock incentive plans or otherwise. Any such issuance could result in substantial dilution to our existing stockholders and cause the trading price of our common stock to decline. We incur significant costs and demands upon management as a result of being a public company. As a public company listed in the United States, we incur significant legal, accounting and other costs that could negatively affect our financial results. In addition, changing laws, regulations and standards relating to corporate governance and public disclosure, including regulations implemented by the SEC and stock exchanges, may increase legal and financial compliance costs and make some activities more time- consuming. These laws,

regulations and standards are subject to varying interpretations and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. We intend to invest resources to comply with evolving laws, regulations and standards, and this investment may result in increased general and administrative expenses and a diversion of management' s time and attention from revenue- generating activities to compliance activities. If notwithstanding our efforts to comply with new laws, regulations and standards, we fail to comply, regulatory authorities may initiate legal proceedings against us and our business may be harmed. Failure to comply with these rules might also make it more difficult for us to obtain some types of insurance, including director and officer liability insurance, and we might be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. The impact of these events could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, on committees of our board of directors or as members of senior management. Changes in tax laws could adversely affect our business and financial condition. The tax regimes to which we are subject or under which we operate are unsettled and may be subject to significant change. In ~~December~~ 2017, tax legislation commonly known as the Tax Cuts and Jobs Act **, or Tax Act,** was enacted, which significantly revised the Internal Revenue Code of 1986, as amended, or the Code. The Tax ~~Cuts and Jobs~~ Act, among other things, ~~contains~~ **resulted in** significant changes to corporate taxation, including reduction of the corporate tax rate from a top marginal rate of 35 percent to a flat rate of 21 percent, limitation of the tax deduction for interest expense to 30 percent of adjusted earnings (except for certain small businesses), limitation of the deduction for net operating losses to 80 percent of current- year taxable income and elimination of net operating loss carrybacks, one time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits (including reducing the business tax credit for certain clinical testing expenses incurred in the testing of certain drugs for rare diseases or conditions). **It** ~~Notwithstanding the reduction in the corporate income tax rate, the overall impact of the federal tax law is uncertain and our business and financial condition could be adversely affected. In addition, it~~ is uncertain if and to what extent various states will conform to the federal tax law. The issuance of additional regulatory or accounting guidance related to the Tax Act, or **legislative** changes proposed or implemented ~~by the current U. S. presidential administration or otherwise~~ , could materially affect our tax obligations and effective tax rate. The increasing use of social media platforms presents new risks and challenges. Social media is increasingly being used to communicate about our research, development candidates, investigational medicines, and the diseases our development candidates and investigational medicines are being developed to treat. Social media practices in the biopharmaceutical industry continue to evolve and regulations relating to such use are not always clear. This evolution creates uncertainty and risk of noncompliance with regulations applicable to our business, resulting in potential regulatory actions against us. For example, participants may use social media channels to comment on their experience in an ongoing blinded clinical trial or to report an alleged adverse event. When such disclosures occur, there is a risk that we fail to monitor and comply with applicable adverse event reporting obligations or we may not be able to defend our business or the public' s legitimate interests in the face of the political and market pressures generated by social media due to restrictions on what we may say about our development candidates and investigational medicines. There is also a risk of inappropriate disclosure of sensitive information or negative or inaccurate posts or comments about us on any social networking website. If any of these events were to occur or we otherwise fail to comply with applicable regulations, we could incur liability, face regulatory actions, or incur other harm to our business. **We are subject to stringent and evolving U. S. and foreign laws, regulations, and rules, contractual obligations, industry standards, policies and other obligations related to data privacy and security. Our actual or perceived failure to comply with such obligations could lead to regulatory investigations or actions; litigation (including class claims) and mass arbitration demands; fines and penalties; disruptions of our business operations; reputational harm; loss of revenue or profits; and other adverse business consequences. In the ordinary course of business, we collect, receive, store, process, generate, use, transfer, disclose, make accessible, protect, secure, dispose of, transmit, and share (collectively, process) personal data and other sensitive information, including proprietary and confidential business data, trade secrets, intellectual property, sensitive third- party data, business plans, transactions, and financial information (collectively, sensitive data). Our data processing activities subject us to numerous data privacy and security obligations, such as various laws, regulations, guidance, industry standards, external and internal privacy and security policies, contractual requirements, and other obligations relating to data privacy and security. In the United States, federal, state, and local governments have enacted numerous data privacy and security laws, including data breach notification laws, personal data privacy laws, consumer protection laws (e. g., Section 5 of the Federal Trade Commission Act), and other similar laws (e. g., wiretapping laws). In the past few years, numerous U. S. states — including California, Virginia, Colorado, Connecticut, and Utah — have enacted comprehensive privacy laws that impose certain obligations on covered businesses, including providing specific disclosures in privacy notices and affording residents with certain rights concerning their personal data. As applicable, such rights may include the right to access, correct, or delete certain personal data, and to opt- out of certain data processing activities, such as targeted advertising, profiling, and automated decision- making. The exercise of these rights may impact our business and ability to provide our products and services. Certain states also impose stricter requirements for processing certain personal data, including sensitive information, such as conducting data privacy impact assessments. These state laws allow for statutory fines for noncompliance. For example, the California Consumer Privacy Act of 2018 (" CCPA "), applies to personal data of consumers, business representatives, and employees who are California residents, and requires certain businesses to provide specific disclosures in privacy notices and honor requests of such individuals to exercise certain privacy rights. The CCPA provides for fines of up to $ 7, 500 per intentional violation and allows private litigants affected by certain data breaches to recover significant statutory damages. Similar laws are being considered in several other states, as well as at the federal and local levels, and we expect more states to pass similar laws in the future. These**

**developments may further complicate compliance efforts, and increase legal risk and compliance costs for us and the third parties upon whom we rely. Outside the United States, an increasing number of laws, regulations, and industry standards may govern data privacy and security. For example, the European Union' s General Data Protection Regulation (" EU GDPR "), the United Kingdom' s GDPR (" UK GDPR "), Brazil' s General Data Protection Law (Lei Geral de Proteção de Dados Pessoais, or " LGPD ") (Law No. 13, 709 / 2018), and China' s Personal Information Protection Law (" PIPL ") impose strict requirements for processing personal data. For example, under GDPR, companies may face temporary or definitive bans on data processing and other corrective actions; fines of up to 20 million Euros under the EU GDPR, 17. 5 million pounds sterling under the UK GDPR or, in each case, 4 % of annual global revenue, whichever is greater; or private litigation related to processing of personal data brought by classes of data subjects or consumer protection organizations authorized at law to represent their interests. In addition, we may be unable to transfer personal data from Europe and other jurisdictions to the United States or other countries due to data localization requirements or limitations on cross- border data flows. Europe and other jurisdictions have enacted laws requiring data to be localized or limiting the transfer of personal data to other countries. In particular, the European Economic Area (EEA) and the United Kingdom (UK) have significantly restricted the transfer of personal data to the United States and other countries whose privacy laws it generally believes are inadequate. Other jurisdictions may adopt similarly stringent interpretations of their data localization and cross- border data transfer laws. Although there are currently various mechanisms that may be used to transfer personal data from the EEA and UK to the United States in compliance with law, such as the EEA' s standard contractual clauses, the UK' s International Data Transfer Agreement / Addendum, and the EU- U. S. Data Privacy Framework and the UK extension thereto (which allows for transfers to relevant U. S.- based organizations who self- certify compliance and participate in the Framework), these mechanisms are subject to legal challenges, and there is no assurance that we can satisfy or rely on these measures to lawfully transfer personal data to the United States. If there is no lawful manner for us to transfer personal data from the EEA, the UK, or other jurisdictions to the United States, or if the requirements for a legally- compliant transfer are too onerous, we could face significant adverse consequences, including the interruption or degradation of our operations, the need to relocate part of or all of our business or data processing activities to other jurisdictions (such as Europe) at significant expense, increased exposure to regulatory actions, substantial fines and penalties, the inability to transfer data and work with partners, vendors and other third parties, and injunctions against our processing or transferring of personal data necessary to operate our business. Additionally, companies that transfer personal data out of the EEA and UK to other jurisdictions, particularly to the United States, are subject to increased scrutiny from regulators, individual litigants, and activities groups. Some European regulators have ordered certain companies to suspend or permanently cease certain transfers of personal data out of Europe for allegedly violating the GDPR' s cross- border data transfer limitations. In addition to data privacy and security laws, we may be contractually subject to industry standards adopted by industry groups. We are also bound by other contractual obligations related to data privacy and security, and our efforts to comply with such obligations may not be successful. We publish privacy policies, marketing materials, and other statements regarding data privacy and security. If these policies, materials or statements are found to be deficient, lacking in transparency, deceptive, unfair, or misrepresentative of our practices, we may be subject to investigation, enforcement actions by regulators, or other adverse consequences. Obligations related to data privacy and security (and consumers' data privacy expectations) are quickly changing, becoming increasingly stringent, and creating uncertainty. Additionally, these obligations may be subject to differing applications and interpretations, which may be inconsistent or conflict among jurisdictions. Preparing for and complying with these obligations requires us to devote significant resources and may necessitate changes to our services, information technologies, systems, and practices and to those of any third parties that process personal data on our behalf. We may at times fail (or be perceived to have failed) in our efforts to comply with our data privacy and security obligations. Moreover, despite our efforts, our personnel or third parties on whom we rely may fail to comply with such obligations, which could negatively impact our business operations. If we or the third parties on which we rely fail, or are perceived to have failed, to address or comply with applicable data privacy and security obligations, we could face significant consequences, including but not limited to: government enforcement actions (e. g., investigations, fines, penalties, audits, inspections, and similar); litigation (including class- action claims) and mass arbitration demands; additional reporting requirements and / or oversight; bans on processing personal data; and orders to destroy or not use personal data. In particular, plaintiffs have become increasingly more active in bringing privacy- related claims against companies, including class claims and mass arbitration demands. Some of these claims allow for the recovery of statutory damages on a per violation basis, and, if viable, carry the potential for monumental statutory damages, depending on the volume of data and the number of violations. Any of these events could have a material adverse effect on our reputation, business, or financial condition, including but not limited to: inability to process personal data or to operate in certain jurisdictions; limited ability to develop or commercialize our products; expenditure of time and resources to defend any claim or inquiry; adverse publicity; or substantial changes to our business model or operations.**