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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2021

OR

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

For the transition period from _____to _____

Commission File Number: 001-39799

Certara, Inc.

(Exact Name of Registrant as Specified in Its Charter)

Delaware	**82-2180925**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
100 Overlook Center, Suite 101 Princeton, New Jersey	**08540**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: **(609) 716-7900**

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

Title of each class	**Trading Symbol**	**Name of each exchange on which registered**
Common stock, par value $0.01 per share	CERT	The Nasdaq Stock Market LLC

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

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

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

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

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

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

Large accelerated filer ☒ Accelerated filer ☐

Non-accelerated filer ☐ Smaller reporting company ☐

Emerging growth company ☐

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

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

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

The aggregate market value of the registrant's outstanding voting common stock held by non-affiliates on June 30, 2021, determined using the per share closing price on that date on The Nasdaq Global Select Market, was $2.1 billion. There is no non-voting common equity of the registrant outstanding. Shares held by each executive officer and director and by each other person or entity deemed to be an affiliate have been excluded in such calculation. The determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of February 25, 2022, the registrant had 159,657,724 shares of common stock, par value $0.01 per share, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the proxy statement for the registrant's 2022 Annual Meeting of Stockholders to be held May 17, 2022, which will be filed with the Securities and Exchange Commission within 120 days after the end of the 2021 fiscal year, are incorporated by reference in Part III of this Annual Report on Form 10-K..

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Certara, Inc.

Unless otherwise indicated, references to the "Company," "Certara," "we," "us" and "our" refer to Certara, Inc. and its consolidated subsidiaries.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K (this "Annual Report") contains "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), which are subject to the "safe harbor" created by those sections. All statements (other than statements of historical facts) in this Annual Report regarding the prospects of the industry and our prospects, plans, financial position and business strategy may constitute forward-looking statements. In addition, forward-looking statements generally can be identified by the use of forward-looking terminology such as "may," "should," "expect," "might," "intend," "will," "estimate," "anticipate," "plan," "believe," "predict," "potential," "continue," "suggest," "project" or "target" or the negatives of these terms or variations of them or similar terminology. Although we believe that the expectations reflected in these forward-looking statements are reasonable, we cannot provide any assurance that these expectations will prove to be correct. Such statements reflect the current views of our management with respect to our operations, results of operations and future financial performance. The following factors are among those that may cause actual results to differ materially from the forward-looking statements:

- our ability to compete within our market;
- any deceleration in, or resistance to, the acceptance of model-informed biopharmaceutical discovery;
- the occurrence of natural disasters and epidemic diseases, including the ongoing COVID 19 pandemic, which may result in delays or cancellations of customer contracts or decreased utilization by our employees;
- changes or delays in government regulation relating to the biopharmaceutical industry;
- increasing competition, regulation and other cost pressures within the pharmaceutical and biotechnology industries;
- trends in research and development ("R&D") spending, the use of third parties by biopharmaceutical companies and a shift toward more R&D occurring at smaller biotechnology companies;
- our ability to successfully enter new markets, increase our customer base and expand our relationships with existing customers;
- our ability to retain key personnel or recruit additional qualified personnel;
- consolidation within the biopharmaceutical industry;
- reduction in the use of our products by academic institutions;
- pricing pressures due to increased customer utilization of our products;
- any delays or defects in our release of new or enhanced software or other biosimulation tools;
- failure of our existing customers to renew their software licenses or any delays or terminations of contracts or reductions in scope of work by our existing customers;
- our ability to accurately estimate costs associated with our fixed-fee contracts;
- risks related to our contracts with government customers, including the ability of third parties to challenge our receipt of such contracts;
- our ability to sustain recent growth rates;
- any future acquisitions and our ability to successfully integrate such acquisitions;
- the accuracy of our addressable market estimates;
- the length and unpredictability of our software and service sales cycles;
- our ability to successfully operate a global business;
- our ability to comply with applicable anti-corruption, trade compliance and economic sanctions laws and regulations;
- risks related to litigation against us;

- the adequacy of our insurance coverage and our ability to obtain adequate insurance coverage in the future;
- our ability to perform our services in accordance with contractual requirements, regulatory standards and ethical considerations;
- the loss of more than one of our major customers;
- our future capital needs;
- the ability or inability of our bookings to accurately predict our future revenue and our ability to realize the anticipated revenue reflected in our backlog;
- any disruption in the operations of the third-party providers who host our software solutions or any limitations on their capacity or interference with our use;
- our ability to reliably meet our data storage and management requirements, or the experience of any failures or interruptions in the delivery of our services over the internet;
- our ability to comply with the terms of any licenses governing our use of third-party open source software utilized in our software solutions;
- any breach of our security measures or unauthorized access to customer data;
- our ability to comply with applicable privacy and data security laws;
- our ability to adequately enforce or defend our ownership and use of our intellectual property and other proprietary rights;
- any allegations that we are infringing, misappropriating or otherwise violating a third party's intellectual property rights;
- our ability to meet the obligations under our current or future indebtedness as they become due and have sufficient capital to operate our business and react to changes in the economy or industry;
- any limitations on our ability to pursue our business strategies due to restrictions under our current or future indebtedness or inability to comply with any restrictions under such indebtedness;
- any impairment of goodwill or other intangible assets;
- our ability to use our net operating loss ("NOLs") and R&D tax credit carryforwards to offset future taxable income;
- the accuracy of our estimates and judgments relating to our critical accounting policies and any changes in financial reporting standards or interpretations;
- any inability to design, implement, and maintain effective internal controls when required by law, or inability to timely remediate internal controls that are deemed ineffective; and
- the other factors discussed under "Risk Factors."

You should not rely upon forward-looking statements as predictions of future events. The forward-looking statements in this Annual Report are based on our beliefs, assumptions and expectations of future performance, taking into account the information currently available to us. These statements are only predictions based upon our current expectations and projections about future events. There are important factors, including those described in the section titled "Risk Factors" and elsewhere in this Annual Report, that could cause our actual results, level of activity, performance or achievements to differ materially from the results, level of activity, performance or achievements expressed or implied by the forward-looking statements. Other sections of this Annual Report may include additional factors that could adversely impact our business and financial performance. Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time and it is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make in this Annual Report. Before investing in our common stock, investors should be aware that the occurrence of the events described under the caption "Risk Factors" and elsewhere in this Annual Report could have a material adverse effect on our business, results of operations and financial condition.

Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance and events and circumstances reflected in the forward-looking statements will be achieved or occur. For a more detailed discussion of the risks, uncertainties and other factors that could cause actual results to differ, please refer to the "Risk Factors" in this Annual Report, as such risk factors may be updated from time to time in our periodic filings with the U.S. Securities and Exchange Commission (the "SEC"). Our periodic filings are accessible on the SEC's website at www.sec.gov.

The forward-looking statements made in this Annual Report relate only to events as of the date on which the statements are made. Except as required by law, we undertake no obligation to update publicly any forward-looking statements for any reason after the date of this Annual Report to conform these statements to actual results or to changes in our expectations.

In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this Annual Report, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and investors are cautioned not to unduly rely upon these statements.

Channels for Disclosure of Information

Investors and others should note that we may announce material information to the public through filings with the SEC, our Investors Relations website (https://ir.certara.com), press releases, public conference calls and public webcasts. We use these channels to communicate with the public about the Company, our products, our services and other matters. We encourage our investors, the media and others to review the information disclosed through such channels as such information could be deemed to be material information. The information on such channels, including on our website, is not incorporated by reference in this Annual Report and shall not be deemed to be incorporated by reference into any other filing under the Securities Act or the Exchange Act, except as expressly set forth by specific reference in such a filing. Please note that this list of disclosure channels may be updated from time to time.

PART I

Item 1. Business.

Our Company

We accelerate medicines to patients using biosimulation software, technology, and services to transform traditional drug discovery and development.

Biosimulation is a powerful technology used to conduct virtual trials using virtual patients to better understand how drugs behave in different individuals. Biopharmaceutical companies use our proprietary biosimulation software throughout drug discovery and development to inform critical decisions that not only save significant time and money but also advance drug safety and efficacy, improving millions of lives each year.

As a global leader in biosimulation based on 2021 revenue, we provide an integrated, end-to-end platform used by more than 2,000 biopharmaceutical companies and academic institutions across 62 countries, including 38 of the top 40 biopharmaceutical companies by R&D spend in 2020. Since 2014, customers who use our biosimulation software and technology-driven services have received 90% of all new drug approvals by the U.S. Food and Drug Administration ("FDA"). Moreover, 17 global regulatory authorities license our biosimulation software to independently analyze, verify, and review regulatory submissions, including the FDA, Health Canada, Japan's Pharmaceuticals and Medical Devices Agency ("PMDA"), and China's National Medical Products Administration ("NMPA"). Demand for our offerings continues to expand rapidly.

While traditional drug development has led to meaningful therapies, such as vaccines and chemotherapy, many patients still wait for life-saving medicines, which can take more than 10 years and $2 billion to bring to market. Change is necessary to continue delivering remarkable gains in human health at an accelerated pace. We believe that biosimulation enables this change.

We build our biosimulation technology on first principles of biology, chemistry, and pharmacology with proprietary mathematical algorithms that model how medicines and diseases behave in the body. For over two decades, we have honed and validated our biosimulation technology with an abundance of data from scientific literature, lab research, and preclinical and clinical studies. In turn, our customers use biosimulation to conduct virtual trials to answer critical questions, such as: What will be the human response to a drug based on preclinical data? How will other drugs interfere with this new drug? What is a safe and efficacious dose for children, the elderly, or patients with pre-existing conditions? Virtual trials may be used to optimize dosing on populations that are otherwise difficult to study for ethical or logistical reasons, such as infants, pregnant women, the elderly, and cancer patients.

The benefits of biosimulation are significant. One of our customers, a top ten global biopharmaceutical company by R&D spend, estimated that they saved more than half a billion dollars over three years using biosimulation to inform key decisions. Biosimulation can reduce the size of and cost of human trials, the most expensive and time-consuming part of drug development, and in some cases, eliminate certain human trials completely. An analysis published on Applied Clinical Trials Online, to which we contributed, estimated that $1 billion was saved in clinical trial costs using biosimulation for a cancer drug due to consistently shorter completion times in the later phase clinical trials.

We develop and apply our biosimulation technology throughout drug discovery and development with what we believe to be the largest and best team of scientists with deep expertise in biosimulation. Our scientists are recognized key opinion leaders who are at the forefront of the science and technology underpinning the rapidly emerging biosimulation field. We have collaborated on more than 5,000 customer projects in the past decade in therapeutic areas ranging from cancer and hematology to diabetes and hundreds of rare diseases. Over the past 2 years, we have worked on 35 programs on vaccines and therapeutics to combat COVID-19.

Biosimulation results need to be incorporated into regulatory documents for compelling submissions. Accordingly, we provide regulatory science solutions and integrate them with biosimulation, so that our customers can navigate the complex and evolving regulatory landscape and maximize their chances of approval. Our differentiated regulatory services are powered by submissions management software and natural language processing for scalability and speed, allowing us to deliver more than 250 regulatory submissions over the past four years. Our team of regulatory professionals has extensive experience applying industry guidelines and global regulatory requirements. In addition, in October 2021, we completed the acquisition of Pinnacle 21, LLC ("Pinnacle"), which develops advanced software for standards-based data management for regulatory submission. Pinnacle enhances our software offerings in data management and the regulatory drug approval process, accelerating the speed and efficiency of developing and bringing drugs to market. Pinnacle's products are used by the FDA and Japan's PMDA to review the quality of submissions.

The final hurdle to delivering medicines to patients is market access, defined as strategies, processes, and activities to ensure that therapies are available to patients at the right price. We believe that biosimulation and market access will continue to be increasingly intertwined as healthcare systems and countries move toward outcomes-based pricing. We provide technology-driven market access solutions, which help our customers understand the real-world impact of therapies and dosing regimens earlier in the process and effectively communicate this to payors and health authorities. Our solutions are underpinned by software as a service ("SaaS")-based value communication.

We have a proven track record of steady growth, driven by higher adoption of biosimulation, expansion of our technology portfolio, strategic acquisitions, and cross-selling of biosimulation, regulatory science, and market access solutions across our end-to-end platform:

- From 2020 to 2021, our revenue increased by 17% from $243.5 million to $286.1 million.
- The number of customers with Annual Customer Value ("ACV") of $100,000 or more in revenue increased from 261 in 2020 to 299 in 2021.

We believe that biosimulation continues to grow in adoption, driven by increasing global regulatory support and advancements in technology. We believe we are well-positioned to capture the significant market opportunity ahead of us. Our growth strategy is to build out the depth and breadth of our scalable, end-to-end biopharmaceutical platform to advance all stages of the continuum, from discovery and development to regulatory submission and market access. We continue to innovate and introduce new functionality and uses of biosimulation and technology-driven solutions. We increasingly integrate the science and data we obtain across this end-to-end platform to inform critical decisions. We further reduce the cost and time of human trials to materially accelerate the speed of development and availability of therapies to patients worldwide. As exciting, new research areas arise, we attract and hire specialized talent and acquire businesses to expand our offerings to address these market opportunities.

With continued innovation in and adoption of our biosimulation software, technology and services, we believe more biopharmaceutical companies worldwide will leverage more of our end-to-end platform to reduce cost, accelerate speed to market, and ensure safety and efficacy of medicines for all patients.

Our Markets

We believe our addressable market within the biopharmaceutical industry is large and rapidly expanding. The current total addressable market ("TAM") for our solutions represents an estimated $13 billion today and is expected to grow at a compound annual growth rate ("CAGR") of approximately 12% to 16% annually over the next five years. Our TAM estimate includes the biosimulation market estimated at $2.8 billion, which is estimated to grow at 16% CAGR over such period according to Grand View Research; the regulatory science market estimated at $8.8 billion, which is estimated to grow at 12% CAGR over such period according to Grand View Research; and the market access market estimated at $1.5 billion, which is estimated to grow at 12% CAGR over such period according to SpendEdge. With increasing adoption of technology across all stages of drug discovery and development, we believe our end-to-end platform and growth strategies position us to further penetrate the rapidly growing technology-driven biopharmaceutical R&D market of the future.

Traditional drug discovery and development is costly and prone to failure. The biopharmaceutical industry was estimated to have spent a total of approximately $212 billion in 2021 on R&D. The probability of success of compounds entering Phase I trials is only 7%. With only 53% of Phase III drugs reaching the market, late-stage failures are common and especially painful as sponsors have already incurred significant cost and time. At the same time, scientific advances are driving increased complexity as the R&D pipeline shifts from small molecules to biologics and cell and gene therapies.

With greater investment dollars being spent and increasing competition in the race to develop novel medicines, the speed and efficiency with which drugs are developed and brought to market have never been more critical. As a result, the demand for and willingness to adopt innovative approaches to discovery, development, and commercialization are rapidly increasing. Continued development and innovation in software and technology such as biosimulation, virtual trials, and real-world evidence tools are helping biopharmaceutical companies increase efficiency and decrease costs. This is further supported by regulatory agencies that have increasingly issued guidance that supports adoption of many of these innovations. For example, the FDA recently announced their Project Optimus initiative to reform the dose selection and optimization paradigm in oncology drug development to maximize both efficacy and safety. Biosimulation's use cases in dose finding and optimization are well-suited to help biopharmaceutical companies navigate this evolving regulatory landscape.

As technology and analytics become increasingly powerful and the application of new solutions is validated, we anticipate this will drive further demand for these innovations. We believe we are still in the early stages of a long-term trend that will continue to advance traditional drug discovery and development into a technology-driven era of advanced modeling and analytics.

In addition, as a result of the COVID-19 pandemic, we believe that the demand for innovative technology solutions in drug discovery and development will continue to be strong. Sponsors and regulators have adopted a number of technology-driven solutions and procedures, which we believe they will continue to use and benefit from in the post-COVID environment.

Our core markets today include:

- ***Biosimulation***: Biosimulation is the mathematical modeling of biological processes and systems to simulate how a drug affects the body, how the body affects the drug, how potential doses will affect different patient groups, and how patients will respond under various clinical scenarios. Biosimulation informs every stage of the drug discovery and development process and brings value through:
    - Identifying potential winners and losers at an earlier stage and allowing programs to “fail faster;”
    - Streamlining preclinical and clinical studies or eliminating certain ones altogether;
    - Optimizing dosing for different populations for enhanced safety and efficacy; and
    - Increasing probability of success and return on R&D, amongst others.
- ***Regulatory Science***: Regulatory science is the development and application of scientific methods, tools, and approaches to support regulatory and other policy objectives. Expert management of these processes is critical to drugs receiving regulatory approval and ultimately reaching patients and generating sales. Providers of regulatory technology and expertise drive significant value for biopharmaceutical companies through:
    - Utilizing best-in-class technology to reduce time-intensive regulatory writing activities and the need for regulatory writing staff;
    - Managing submission timelines and other requirements of global regulatory agencies;
    - Generating clear, accurate applications and submissions; and

- Developing comprehensive global regulatory strategies, amongst others.

- ***Market Access***: To achieve commercial access, sponsors must assess, optimize and persuasively communicate the value of a new therapy, both therapeutic and economic, that stakeholders such as payors and health care providers will accept and act on. Market access services, including real-world evidence and health economics outcomes research, generate value by:

    - Creating cost and comparative effectiveness models to support pricing and payor reimbursement;

    - Analyzing payor needs and using economic models to develop contracting strategies that optimize value; and

    - Collecting and analyzing real-world data for use in market and payor communications, amongst others.

We believe that our end-to-end platform is well-positioned to continue benefiting from market trends. In addition to continued growth in our core markets, we expect to capture a broader share of overall biopharmaceutical R&D spend as we continue to innovate and add new solutions to our end-to-end platform.

Our Competitive Strengths

We compete by offering a broad and deep combination of industry-standard biosimulation software and technology-driven services across all stages of the continuum, from discovery and development to regulatory approval and market access. We have cultivated the following competitive strengths for more than two decades:

Our Proprietary, Scalable Biosimulation Software

Our proprietary, scalable biosimulation software, built on first principles integrates biosimulation models, scientific knowledge, and data, which we believe would require years of effort, immense resources, and scarce expertise to duplicate. Our versatile biosimulation software is deployed to public and private cloud networks, on-premises, and data centers. Scientists can run multiple simulation projects on a cloud compute platform or internal clusters. We protect our proprietary technology through intellectual property rights, including copyrights, patents, trade secrets, know-how, and trademarks.

Our Integrated End-to-End Platform

We have developed a differentiated, integrated end-to-end platform of software and technology-driven services, powered by proprietary technology and unique talent, spanning discovery through market access. Our customers, facing declining R&D productivity and an increasingly complex regulatory and market access environment, seek trusted partners to accelerate their R&D programs and achieve regulatory and commercial success. Our integrated set of solutions uniquely positions us to be their first-choice partner. More than ninety percent of our top 50 customers by revenue use both our biosimulation solutions and regulatory and market access offerings.

Our Innovation Framework

We are at the forefront of innovation in biosimulation. Beyond our sustained R&D investment ($28.1 million or 10% of revenues in 2021), our innovation framework advances both incremental and breakthrough innovations in biosimulation to transform traditional drug discovery and development.

- ***Customer-Centricity***: Through our consortium model and approximately 1,200 biosimulation projects and workshops annually, we derive significant insights that inform the development of our biosimulation software. These insights help us to anticipate and align our technology roadmap with our customers' needs and priorities.

- ***Regulatory Alignment***: As we continuously engage with regulators through our customers' programs, training workshops, and attendance at FDA and other regulator meetings, we develop an in-depth understanding of how to align our biosimulation software and services to meet evolving regulatory expectations and requirements.

- ***Scalable Data Collection and Curation***: Using artificial intelligence and our scientific team, we have curated data from more than 10,000 clinical studies and 18,000 peer-reviewed manuscripts. We have created 25 different virtual patient populations, approximately 100 compound drug files, 55 clinical outcomes databases, and advanced mathematical models for ten organs.

- ***Scientific Research***: We work with our customers, a scientific advisory board of thought leaders, and academic institutions to innovate bottom-up, mechanistic models of drug, disease, and human biology. Each mathematical equation or parameter estimation is based on up-to-date scientific knowledge and data. We use scientific literature, lab data, and our customers' preclinical and clinical studies to refine, verify, and validate these models to ensure that they meet rigorous scientific and quality standards.

Our Trusted, Long-Term Customer and Regulatory Partnerships

We work continuously and closely with our customers to provide software and technology-driven services from drug discovery and development to regulatory science and market access, applying biosimulation throughout the continuum to maximize R&D productivity and increase the probability of success. We have substantial repeat business and long-term partnerships. Our top 30 customers by revenue in 2021 have been with us for more than ten years on average. We are often favored by our customers for follow-on projects throughout a drug's lifecycle, leveraging our early engagements in preclinical or Phase I to provide continuous support in later phases such as dose optimization for a Phase III study or a new drug application regulatory filing.

- ***Consortium Model with Biopharmaceutical Companies***: Our Simcyp Platform benefits from a unique business and customer collaboration model that we term a "consortium." Established more than 20 years ago, our consortium model provides for intense and detailed customer input into software enhancements. This R&D feedback loop, driven by customer needs, results in ongoing advancement and incorporation of more scientific data that increases the value of our Simcyp Platform over time. Our consortium members, consisting of scientists from leading global biopharmaceutical companies, sign multi-year contracts and actively participate in consortium meetings, so that we continuously extend our scientific and commercial leadership.

- ***Long-Standing Regulatory Partnerships***: Seventeen regulatory agencies license our biosimulation software. In addition, our scientists are regularly invited by U.S, European, and Japanese regulatory agencies to teach and participate in their workshops. We have received six grants and a Cooperative Research and Development Agreement from the FDA as well as grants from seven European organizations, including the EU Commission, to develop biosimulation models and conduct biosimulation analyses.

- ***Academic Centers of Excellence***: We work closely with the global academic community on research, publications, and training of the next generation of biopharmaceutical scientists. We have established nine Centers of Excellence worldwide, which use our biosimulation software in their courses and scientific research. Additionally, nearly 400 academic institutions worldwide license our biosimulation software.

- ***Certara University***: We recognize that education in the theory and practice of biosimulation is pivotal to adoption and achieving the benefits of biosimulation. Certara University provided in-person and online training on biosimulation and the use of our biosimulation software to more than 3,000 scientists in 2021.

The Deep Expertise of Our People and Our Culture of Innovation

We are led by a diverse, global, and talented team of scientists, software engineers, and subject matter experts who not only advance our technology but also seek to understand and tackle our customers' greatest challenges. Over the last decade, we have worked on more than 5,000 customer projects, leading to extensive experience, which our customers

highly value. As of December 31, 2021, 352 of our employees held PhD, PharmD, or MD degrees. Our team of software engineers and technologists excels at applying computer science, engineering, and scientific and mathematical principles in designing and developing complex software with consistent execution. World-leading experts in biosimulation, drug discovery and development, software development, regulatory science, and market access work and thrive at Certara.

Our global executive management team brings together extensive experience in science, technology, and business. Sharing core values of dedication, quality, and respect, the executive management team is focused on fostering our passion for science and growing our culture of innovation, excellence, collaboration, and customer-centricity as well as delivering exceptional performance.

Our Growth Strategy

Our growth strategy is to build upon our scalable, end-to-end platform. We continue to innovate in biosimulation, engage with regulatory agencies, and land and expand our customer partnerships. We remain focused on reducing the cost, time, and probability of failure of clinical trials for our customers, so that they can materially accelerate the availability of future therapies that are needed by patients worldwide. As exciting, new research areas arise, such as cell and gene therapy, we attract and hire specialized talent and acquire businesses to expand our offerings accordingly.

Advance Our Technology

The science, technology, and data behind biosimulation continue to advance rapidly, and our top investment priority is to develop additional functionality and uses for biosimulation to improve patient outcomes. We release new software, additional features, and upgrades on a frequent and regular basis. In 2021, we introduced 10 new software applications and upgrades, including Secondary Intelligence, D360 Scientific Informatics, Simcyp Immuno-oncology Quantitative Systems Pharmacology (“QSP”) and Pinnacle 21 Enterprise.

We are investing in three major areas to elevate our technology:

- ***Spearheading the Frontier of QSP and Toxicology***, an emerging approach with enormous potential for industry-wide transformation to optimize decisions in both drug discovery and development. In addition to QSP for immunogenicity, immuno-oncology, and COVID-19, we are ramping up our QSP consortia for neurodegenerative diseases, such as Alzheimer’s and Parkinson’s, and for quantitative systems toxicology and safety (“QSTS”). Neuroscience is expected to have the most growth in QSP modeling over the next several years, followed by oncology and autoimmune disorders. All of our mechanistic simulators communicate seamlessly with each other, which is a major advantage for complex drug discovery and development programs.

- ***Continuing to Develop Cloud-Based Solutions***, such as Certara Integral Data Repository, CODEx Clinical Outcomes Databases, BaseCase Value Communication Software, and Pinnacle 21 Enterprise, which enhance computing scalability, significantly reduce maintenance time and cost, and promote access, collaboration and mobility. This also allows us to easily deliver new features and explore new business models.

- ***Architecting an Ecosystem of Interconnected Software Applications*** to facilitate seamless workflows and sharing of data across the drug discovery and development continuum for efficiency and speed.

Grow Within Our Existing Customer Base

As we continue to expand our portfolio of offerings, we integrate our solutions and sell more across our end-to-end platform. Our scientists and regulatory and market access experts, business developers, marketing professionals, and business leaders work together to ensure a high-quality customer experience and nurture long-term partnerships. As a result, our customer relationships grow steadily over time, driven by higher adoption of biosimulation with additional user licenses and more modules.

We also cross-sell our software and technology-driven services throughout our end-to-end platform. Many of our customers who use biosimulation also rely on us for regulatory strategy, writing, and submissions support, including the

majority of our top 50 customers. The number of customers with annual customer value of $100,000 or more in revenue increased from 261 in 2020 to 299 in 2021, a 15% increase. The success of our land and expand approach is further demonstrated by our high re-occurring revenue streams with an aggregate renewal rate of 92% for our software customers from 2020 to 2021 and net revenue repeat rate (defined as the level of technology-driven services revenue generated from our existing customers from period to period, accounting for expansion and churn) of 108% for our technology-driven

Expand Our Customer Base Globally

We are growing our footprint globally to match that of the biopharmaceutical industry. There are nearly 5,100 biopharmaceutical companies worldwide with active R&D pipelines, up from nearly 2,400 in 2011, according to Informa's Pharma R&D Annual Review 2021. Informa also estimates that the R&D pipeline encompassed more than 18,000 drug programs in 2021. As drug discovery and development in Asia Pacific grows, we are investing heavily to expand our presence in the region to work with these customers where they are, just as we already have in North America, Europe and Japan. We continue to build our sales and marketing capabilities and capacity to expand our global reach.

Scale Through Acquisitions

Biosimulation is an exciting technology with many promising, future developments, and we believe there are numerous opportunities to pursue strategic acquisitions to accelerate our development roadmap. We have a proven record of successfully acquiring and integrating software and services companies. To date, we have acquired 15 companies of which 10 included software or technology such as Simcyp, the core of our mechanistic biosimulation platform, Xenologiq, which jumpstarted our biosimulation initiative using QSP, and Pinnacle 21, which enhances our software offerings in data management and the regulatory drug approval process. As we build out the depth and breadth of our biosimulation platform, we continually seek and assess a range of highly focused opportunities in our immediately addressable market and in related adjacent markets, whether through acquisitions, licenses, or partnerships.

Inspire Our People

Our more than 1,100 employees are the key to our success. The diversity and depth of expertise, experience, and backgrounds in our vibrant community bring richness of ideas, problem-solving capabilities, and mutual respect. We are dedicated to attracting, retaining, and growing leading scientists and experts who are passionate about developing medicines that matter. We strive to encourage intellectual curiosity and offer a myriad of professional development opportunities. We continue to invest in our people to help them thrive and solidify our position as an employer of choice in our industry.

The Certara End-to-End Platform

We provide both software and technology-driven services to enable customers to realize the full benefits of biosimulation in drug discovery, preclinical and clinical research, regulatory submission, and market access. Our software is primarily subscription-based with licenses ranging from one to three years.

Certara End-to-end Platform

Software

Our software, utilized by more than 20,000 licensed users in biosimulation and 40,000 more in regulatory, compliance and market access, addresses seven main applications: 1) mechanistic biosimulation; 2) empirical pharmacokinetic and pharmacodynamic biosimulation; 3) data standardization and compliance software; 4) scientific informatics 5) clinical outcomes databases for biosimulation; 6) authoring and management of regulatory submissions; and 7) market access communication. We deploy our software to customers on public and private cloud networks, on-premises, and in data centers.

- ***Mechanistic Biosimulation Platform (Simcyp)***: Mechanistic biosimulation predicts both how a drug is handled within the body (known as "pharmacokinetics" or "PK") and drug effect (known as "pharmacodynamics" or

"PD"), without the need for actual in vivo human or animal studies. Eighteen of the top 20 biopharmaceutical companies by R&D spend in 2020 used the Simcyp Platform in 2021. Simcyp includes three main modules:

- *Physiologically-based pharmacokinetic ("PBPK") modeling and simulation*: Our industry-standard Simcyp PBPK Simulator includes a whole-body model to run virtual "what if?" scenarios without human clinical studies. One benefit is understanding how dosing should be adjusted for special populations such as children or the elderly. A second is to identify potential drug-drug interactions so they can be included on drug labels to make the product safer. Simcyp is used by 11 regulatory agencies to evaluate submissions.

- *Quantitative systems pharmacology*: A rapidly growing field in biosimulation, QSP combines computational modeling and vast amounts of 'omics (e.g., genomics, proteomics, metabolomics) data to predict clinical efficacy outcomes for novel targets, drug modalities, and combination therapies. By using QSP to understand the physiological mechanisms driving efficacy, customers can terminate unpromising discovery programs earlier, and promote stronger candidates to clinical testing, thus reducing costly late-stage failures. Once marketed, the same physiological knowledge can differentiate launch messaging, helping the drug to stand out from the competition.

- *Quantitative systems toxicology and safety*: Secondary Intelligence, our QSTS software, integrates toxicology with quantitative analysis of large networks of molecular and functional biological changes to identify drug toxicity and adverse drug reactions earlier.

Our Simcyp Platform has generated results that inform more than 250 label claims for nearly 90 drugs. Had customers attempted to acquire the same information through conventional human trials, we believe they would have faced millions of dollars in additional costs and significant launch delays, given that clinical trials are estimated to take 1 to 2.5 years on average and cost many millions of dollars, according to Nature Reviews Drug Discovery.

- ***Empirical PK/PD Biosimulation Platform (Phoenix)***: Once our customers have empirical data from their actual trials assessing drug dissolution, blood concentration, and effect, they must interpret the data and make interpolations and extrapolations to inform dosing, handling of drug-drug interactions, and formulation decisions for subsequent trials and for patient use after launch. Phoenix includes multiple modules for the full empirical biosimulation workflow including conventional and biosimulation-driven interpretation (WinNonlin, NLME, and IVIVC), and related workflow modules for validated data handling, model management, and regulatory reporting (PK Submit, Certara Integral, Validation Suites). Customers benefit by gaining a validated, streamlined workflow for reporting their clinical pharmacology information to the FDA and other agencies. Furthermore, customers can be confident they are using the same tools used by regulators to evaluate their products.

- ***Data Standardization and Compliance Software* (*Pinnacle 21 Enterprise*)**: Pinnacle 21 Enterprise helps to ensure that submission data is compliant with regulatory standards, which helps to enable a more efficient review process. Data standards are complex and increasingly challenging to adhere to as the volume of data in clinical trials continues to grow. Pinnacle 21 Enterprise creates consistent, compliant, and high-quality datasets that reduce the risk of costly regulatory delays, while accelerating the speed and efficiency of developing and bringing drugs to market. It is the same tool used by the FDA and Japan's PMDA to review the quality of submissions.

- ***Scientific Informatics Platform (D360)***: D360 provides customers with self-service access and analytics to manage their small molecule and biologics discovery projects. The platform includes chemical structure search capabilities for structure-activity relationship analysis, molecular design tools and visualization solutions. The product connects seamlessly with biology and chemistry data systems from third-party companies, without extensive IT setup and maintenance.

- ***Clinical Outcomes Databases for Biosimulation (CODEx)***: Our customers license our 55 proprietary CODEx databases in a range of disease areas for meta-analysis of a new drug's safety and efficacy in relation to competitive products. The databases cover more than 10,000 clinical trials and observational studies and are accessible via an online portal with analytical and visualization tools.

- ***Authoring and Management of Regulatory Submissions Platform (GlobalSubmit)***: Our customers license our advanced, cloud-based electronic common technical document ("eCTD") software for publishing, review, validation, and electronic filing of regulatory submissions.

- ***Market Access Communication Platform (BaseCase)***: We license a cloud-based SaaS platform for drag-and-drop visualization of biosimulation results and other complex data. Customers use our software to communicate the value of a new therapy to payors and providers to gain formulary acceptance and reimbursement.

Technology-Driven Services

Our technology-driven, biosimulation services help customers who do not have staff capability or availability to gain the benefits of biosimulation. We also provide related, technology-driven services to guide our customers' new drugs through the regulatory submission process and into the market. Our technology-driven services include integrated drug development services include mechanistic biosimulation, empirical biosimulation, drug development and regulatory writing and medical communications, regulatory operations, and market access. Regulatory agencies promote and endorse the use of biosimulation in drug development as "model informed drug discovery and development," which integrates our software and technology-driven services to inform key decisions during drug discovery, development, approval, and subsequent market access.

- ***Mechanistic Biosimulation:*** We utilize our Simcyp Platform for predicting PK to determine first-in-human dose selection, design more efficient and effective clinical studies, evaluate new drug formulations, and predict drug-drug interactions. We use our QSP and QSTS software to advise customers on target selection and ranking and strategies for avoiding toxicities.

- ***Empirical Biosimulation:*** We use our Phoenix Platform and other tools to provide a wide range of quantitative biosimulation approaches such as non-compartmental analysis, PK/PD modeling, and population PK/PD analyses.

- ***Drug Development and Regulatory Strategy:*** We develop and deliver drug development and regulatory plans and provide high-level regulatory input to customer projects, incorporating biosimulation and supporting decision making through critical development and investment stage gates.

- ***Clinical Pharmacology:*** We provide early-phase development plans and study designs across the development life cycle, often incorporating biosimulation. We use clinical pharmacology gap analysis and modeling to anticipate and manage development risks.

- ***Model-Based Meta-Analysis:*** We utilize curated clinical trial and real-world data from our CODEx clinical outcomes database platform together with model-based meta-analysis to assess a new drug's safety and efficacy in relation to competitive products.

- ***Regulatory Writing and Medical Communications:*** We support submissions from early-stage investigational new drugs to late-stage new drug applications, biologics license applications, and market authorization applications, by writing regulatory documents such as clinical study protocols/reports, safety submissions, and other summary documents for submission to the FDA and global regulatory authorities. We manage technical editing including transparency and disclosure services to ensure that our customers' regulatory documents are "filing-ready." Our team also offers advanced publication planning and writing support for scientific and medical publications. We deploy natural language processing software and other technology to enable efficient and scalable document creation.

- ***Regulatory Operations:*** We manage the submission of regulatory documents using our GlobalSubmit platform. Our submission management services include submission leadership, program management and planning, due diligence and readiness preparation, submission compilation, and eCTD publishing. We support applications to

all major health agencies, including the FDA, Europe's EMA, Health Canada, Japan's PMDA, and China's NMPA.

- ***Market Access:*** We assist customers in demonstrating the value of new drugs and health technologies to payors and other stakeholders to support their efforts in securing reimbursement and access in global markets. These services include conducting real-world evidence and health economics outcomes research, delivering value and access consultancy solutions, creating cost and comparative effectiveness models to support pricing and payor reimbursement, and collecting and analyzing real-world data for use in market and payor communications.

Sales and Marketing

Our sales and marketing functions pursue a coordinated approach with a global commercial team of business development, product management, and marketing experts. Our global commercial team collaborates with our scientists, subject matter experts, and technologists to engage with customers and prospects to understand their needs and offer tailored solutions with our biosimulation software and technology-driven services. Our scientists and experts have authored thousands of scientific publications, posters, and articles to share biosimulation knowledge and methods to advance adoption. We also partner with software distributors in global regions to expand our reach.

Competition

The market for our biosimulation products and related services for the biopharmaceutical industry is competitive and highly fragmented. In biosimulation software market, we primarily compete with companies smaller than ourselves, such as Simulations Plus and NONMEM, a division of ICON. Other competitors include Schrodinger, open-sourced solutions such as R and PK-Sim, and internally-developed software in biopharmaceutical companies. We generally compete in the biosimulation software market on the basis of the quality and capabilities of our products, our scientific and technical expertise, our ability to innovate and develop solutions attractive to customers, our customer and regulatory agency partnerships, and price, amongst other factors.

Our technology-driven services generally compete with companies significantly smaller than ourselves, such as Metrum Research Group and Simulations Plus. We also face competition in this space from in-house teams at biopharmaceutical companies and academic and government institutions. In some standard biosimulation services and in regulatory science and market access, we compete with contract research organizations. We generally compete in the technology-driven services markets on the basis of our reputation and experience, our expertise and the qualifications of our team, our ability to offer services attractive to customers, and price, amongst other factors.

We believe that our competitive position is strong, and that we are able to effectively win new projects with our integrated, end-to-end platform.

Intellectual Property

We safeguard and enhance our innovative technology platforms, systems, processes, and databases with a full array of intellectual property rights, including copyrights, trade secrets and know-how, patents, and tradenames/trademarks.

All of our proprietary software products are copyright protected, and further reinforced by contractual provisions in our software license agreements prohibiting our users from reverse engineering, deriving, or otherwise using the source code and underlying algorithms for anything other than the permitted and intended use. Embedded within some of our biosimulation tools, including the Simcyp Simulator, are several decades' worth of proprietary data that have been compiled and collated from both public and private sources. These data, in tandem with our proprietary source code and algorithms, create powerful modeling tools that cannot be readily duplicated. Continual ongoing development of source code and algorithms as well as new version release of modelling tools also ensures that our proprietary software products are difficult to copy. Our processes and systems are further protected by trade secrets and know-how, which we secure by requiring and strictly enforcing confidentiality obligations with our employees, contractors, customers, and other third parties, and invention assignment agreements with our employees, as well as through administrative and technical safeguards. However, trade secrets and confidential know-how are difficult to protect. Agreements may not always provide

meaningful protection. These agreements may also be breached, and we may not have an adequate remedy for any such breach. In addition, our trade secrets and/or confidential know-how may become known or be independently developed by a third party, or misused by any collaborator to whom we disclose such information. Despite any measures taken to protect our intellectual property, unauthorized parties may attempt to copy aspects of our products or to obtain or use information that we regard as proprietary. Although we take steps to protect our proprietary information, third parties may independently develop the same or similar proprietary information or may otherwise gain access to our proprietary information. As a result, we may be unable to meaningfully protect our trade secrets and proprietary information. We license and use the intellectual property of third parties, primarily in our software development, although no one such license is considered to be material to the business as a whole.

We also maintain a portfolio of issued and pending patents in several of jurisdictions in which we do business. As of December 31, 2021, our patent portfolio consisted of 26 issued patents and 7 pending patent applications related to our software and technology. We do not currently consider any of our issued patents to be material to our business. Several of our most recently filed patent applications relate to our liquid biopsy project, and describe a method of gleaning information from a simple blood test that can be used to predict and optimize how that individual patient will absorb and metabolize a drug, thereby allowing a clinician to determine the optimal dosing of a drug on an individual basis. We believe these patent applications, if issued, will accelerate our leadership in individualized precision dosing. We cannot predict whether the patent applications we are currently pursuing will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provide sufficient proprietary protection from competitors.

We also have applied for and/or obtained and maintain registration in the United States and other countries for numerous trademarks, including Certara, Simcyp, Phoenix, Pinnacle 21, Virtual Twin, WinNonlin, and BaseCase. We pursue trademark registrations to the extent we believe doing so would be beneficial to our competitive position.

We are not presently a party to any legal proceedings relating to intellectual property that, in the opinion of our management, would individually or taken together have a material adverse effect on our business, financial condition, results of operations or cash flows.

Human Capital

We are led by a diverse, global, and talented team of scientists, software developers, and subject matter experts who seek to understand our customers' challenges and are dedicated to tackling these challenges. As of December 31, 2021, we employed a total of 1,114 individuals, including 1,054 full-time employees and 60 part-time employees, of which 352 held Ph.Ds. in their respective disciplines, including clinical pharmacology and pharmacometrics. As of December 31, 2021, we employed 336 scientists, 241 regulatory experts, 78 market access specialists, and 134 software developers and technologists. Most of the senior management team and the members of our board of directors hold either PhDs and/or other advanced degrees. We are very proud to say that some of the world-leading experts in biosimulation, drug discovery and development, software development, regulatory science, and market access work and thrive at Certara. We offer employees a myriad of professional development opportunities and encourage a performance-driven environment. In 2021, we focused on creating a robust culture in a remote work environment to encourage retention and engagement, and instituted a number of health and wellness initiatives, such as a global fitness challenge. We also enhanced our diversity and inclusion programs, including instituting company-wide unconscious bias training and expanding our recruiting efforts to reach a more diverse talent pool, in keeping with our CEO's pledge to act on supporting a more inclusive workplace. None of our employees are represented by a labor union, and we have never experienced a work stoppage. We believe that our relations with our employees are positive.

Government Regulation

Regulation of Biopharmaceutical Products

The development, testing, manufacturing, labeling, approval, promotion, distribution and post-approval monitoring and reporting of biopharmaceutical products are subject to regulation by numerous governmental authorities at both the national and local levels, including the FDA in the United States, as well as those of other countries, such as the EMA in the European Union and the Medicines and Healthcare products Regulatory Agency in the United Kingdom. Although our biosimulation software products and platforms are not approved by the FDA or other government agencies, our customers' products are subject to these regulations, which may be applicable to us to the extent that the services and deliverables we provide to our customers are used in their marketing applications. Consequently, we must comply with relevant laws and regulations relating to certain aspects of the drug and biologic development and approval process. For example, our customers may require that documents or records we produce that may be used in the approval process be compliant with part 11 of Title 21 of the U.S. Code of Federal Regulations, which relates to the creation, modification, maintenance, storage, retrieval, or transmittal of electronic records submitted to the FDA. Further, certain portions of our business, such as the biosimulation work we conduct in connection with designing clinical trials, must comply with current Good Laboratory Practices ("GLP") and Good Clinical Practices ("GCP") requirements as established by the International Council on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use, as adopted by the FDA and similar regulatory authorities in other countries, which helps ensure the quality and integrity of the data we produce. To help ensure compliance with GLP and GCP, we have established a robust quality management system that includes standard operating procedures, working practice documents and processes, and quality assurance personnel to audit deliverables intended to be used in our customers' drug and biologic approval applications.

Privacy and Security Laws

The collection, processing, use, disclosure, disposal and protection of information about individuals, in particular healthcare data, is highly regulated both in the United States and other jurisdictions, including but not limited to, under Health Insurance Portability and Accountability Act of 1996 ("HIPAA"), as amended by the Health Information Technology for Economic and Clinical Health Act ("HITECH"); U.S. state privacy, security and breach notification and healthcare information laws; the European Union's General Data Protection Directive ("GDPR"; and other European privacy laws as well as privacy laws being adopted in other regions around the world. Although most of the clinical data we receive from our customers is de-identified, in certain parts of our business, such as our real-world data and analytics program, we hold confidential personal health and other information relating to persons who have been, are and may in the future be involved in clinical trials. The possession, retention, use and disclosure of such information is highly regulated, including under the laws and regulations described above. These data privacy and security regulations govern the use, handling and disclosure of information about individuals and, in the case of HIPAA, require the use of standard contracts, privacy and security standards and other administrative simplification provisions. In relation to HIPAA, we do not consider our service offerings to generally cause us to be subject as a covered entity; however, in certain circumstances we are subject to HIPAA as a business associate and may enter into business associate agreements with our customers who are covered entities under HIPAA. These business associate agreements define our obligations to safeguard the personal health information of patients provided by our customers. We have adopted identity protection practices and have implemented procedures to satisfy data protection requirements and safeguards regarding the creation, receipt, maintenance and transmission of protected health information.

In addition, the Federal Trade Commission (the "FTC") and many state attorneys general are interpreting existing federal and state consumer protection laws to impose evolving standards for the online collection, use, dissemination and security of information about individuals, including health-related information. Courts may also adopt the standards for fair information practices promulgated by the FTC, which concern consumer notice, choice, security and access. Consumer protection laws require us to publish statements that describe how we handle information about individuals and choices individuals may have about the way we handle their information. Certain states have also adopted robust data privacy and security laws and regulations. For example, the California Consumer Privacy Act ("CCPA"), which took effect in 2020, imposes obligations and restrictions on businesses regarding their collection, use, and sharing of personal information and provides new and enhanced data privacy rights to California residents, such as affording them the right to access and delete their personal information and to opt out of certain sharing of personal information. Protected health information that is

subject to HIPAA is excluded from the CCPA, however, information we hold about individuals which is not subject to HIPAA would be subject to the CCPA It is unclear how HIPAA and the other exceptions may be applied under the CCPA.

The collection, use, storage, disclosure, transfer, or other processing of any personal data regarding individuals in the European Union, including personal health data, is subject to the GDPR, which became effective on May 25, 2018. The GDPR is wide-ranging in scope and imposes numerous requirements on companies that process personal data, including requirements relating to processing health and other sensitive data, obtaining consent of the individuals to whom the personal data relates, providing information to individuals regarding data processing activities, implementing safeguards to protect the security and confidentiality of personal data, providing notification of data breaches, and taking certain measures when engaging third-party processors. The GDPR also imposes strict rules on the transfer of personal data to countries outside the European Union, including the United States, and permits data protection authorities to impose large penalties for violations of the GDPR, including potential fines of up to €20 million or 4% of annual global revenues, whichever is greater. The GDPR also confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR.

Recent legal developments in Europe have created complexity and uncertainty regarding transfers of personal data from the European Economic Area ("EEA") to the United States, e.g. on July 16, 2020, the Court of Justice of the European Union (the "CJEU") invalidated the Privacy Shield under which personal data could be transferred from the EEA to U.S. entities who had self-certified under the Privacy Shield scheme. While the CJEU upheld the adequacy of the standard contractual clauses (a standard form of contract approved by the European Commission as an adequate personal data transfer mechanism, and potential alternative to the Privacy Shield), it made clear that reliance on them alone may not necessarily be sufficient in all circumstances; this has created uncertainty. We have previously relied on our own Privacy Shield certification and our relevant customers'/ clients'/ partners'/ providers'/ third parties' Privacy Shield certification(s) for the purposes of transferring personal data from the EEA to the United States in compliance with the GDPR's data export conditions. We also currently rely on the standard contractual clauses to transfer personal data outside the EEA, including to the United States, among other data transfer mechanisms pursuant to the GDPR, but excluding Privacy Shield.

In response to the data privacy laws and regulations discussed above and those in other countries in which we do business, we have implemented several technological safeguards, processes, contractual third-parties provisions, and employee trainings to help ensure that we handle information about our employees, customers, and in a compliant manner. We maintain a global privacy policy and related procedures, and train our workforce to understand and comply with applicable privacy laws.

Bribery, Anti-Corruption and Other Laws

We are subject to compliance with the U.S. Foreign Corrupt Practices Act ("FCPA") and similar anti-bribery laws, such as the U.K. Bribery Act of 2010 ("Bribery Act"), which generally prohibit companies and their intermediaries from making improper payments to foreign government officials for the purpose of obtaining or retaining business. In addition, in the United States, we may also be subject to certain state and federal fraud and abuse laws, including the federal Anti-Kickback Statute and False Claims Act, that are intended to reduce waste, fraud and abuse in the health care industry. Our employees, distributors, and agents are required to comply with these laws, and we have implemented policies, procedures, and training, to minimize the risk of violating these laws.

Our Corporate Information

Certara, Inc. was incorporated in Delaware on June 27, 2017. Our principal business office is located at 100 Overlook Center, Suite 101, Princeton, New Jersey 08540, and the telephone number of our principal business office is (609) 716-7900. Our internet address is www.certara.com. Our internet website and the information contained therein or connected to or linked from our internet web site are not incorporated information and do not constitute a part of this Annual Report or any amendment thereto.

Available Information

Our Investor Relations website is located at https://ir.certara.com. We have used, and intend to continue to use, our Investor Relations website and our corporate website located at www.certara.com as a means of disclosing material non-public information and for complying with our disclosure obligations under Regulation FD. The following filings are available through our Investor Relations website as soon as reasonably practicable after we file them with, or furnish them to, the SEC: Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and our Proxy Statement for our annual meeting of stockholders, as applicable (as well as any amendments to those reports). These documents are also available for download free of charge through a link on our Investor Relations website. The SEC also maintains a website at www.sec.gov that contains reports, proxy and information statements, and other information about reporting issuers, like us, that file electronically with the SEC. Our internet website and the information contained therein or connected to or linked from our internet web site are not incorporated information and do not constitute a part of this Annual Report.

Item 1A. Risk Factors.

Investing in our common stock involves a high degree of risk. You should carefully consider the following risk factors together with other information in this filing, including our consolidated financial statements and related notes included elsewhere in this filing, before deciding whether to invest in shares of our common stock. The occurrence of any of the events described below could harm our business, financial condition, results of operations and growth prospects. In such an event, the trading price of our common stock may decline and you may lose all or part of your investment.

Summary of Risk Factors

Our business is subject to numerous risks and uncertainties, discussed in more detail in the following section. These risks include, among others, the following key risks:

- Deceleration in, or resistance to, the acceptance of model-informed biopharmaceutical discovery and development by regulatory authorities or academic institutions could damage our reputation or reduce the demand for our products and service.
- We compete in a competitive and highly fragmented market.
- Our business may be subject to risks arising from natural disasters and epidemic diseases, such as the recent COVID-19 pandemic.
- Changes or delays in government regulation relating to the biopharmaceutical industry could decrease the need for some of the services we provide.
- Reduction in research and development spending by our customers for a variety of reasons, as well as delays in the drug discovery and development process, may reduce demand for our products and services and negatively impact our results of operations and financial condition.
- Consolidation within the biopharmaceutical industry may reduce the pool of potential customers for our products and services or reduce the number of licenses for our software products.
- As customers increase their utilization of our products and services, we may be subject to additional pricing pressures.
- Our continued revenue growth depends on our ability to successfully enter new markets, increase our customer base and expand our relationship and the products and services we provide to our existing customers.

- Delays or defects in the release of new or enhanced software or other biosimulation tools may result in increased cost to us, delayed market acceptance of our products, diminished demand for our products, delayed or lost revenue, and liability.
- If our existing customers do not renew their software licenses, do not buy additional solutions from us or renew at lower prices, our business and operating results will suffer.
- Our customers may delay or terminate contracts, or reduce the scope of work, for reasons beyond our control, or we may underprice or overrun cost estimates with our fixed-fee contracts, potentially resulting in financial losses.
- We depend on key personnel and may not be able to retain these employees or recruit additional qualified personnel, which could harm our business.
- We have government customers and have received government grants, which subject us to risks including early termination, audits, investigations, sanctions, or penalties.
- Our recent growth rates may not be sustainable or indicative of future growth.
- We regularly evaluate potential acquisitions of other companies and technologies, which could divert our management's attention, result in additional dilution to our stockholders, and otherwise disrupt our operations and adversely affect our operating results.
- Our estimated addressable market is subject to inherent challenges and uncertainties. If we have overestimated the size of our addressable market or the various markets in which we operate, our future growth opportunities may be limited.
- We are subject to risks associated with the operation of a global business.
- We are subject to the FCPA and the Bribery Act and similar anti-corruption laws and regulations in other countries. Violations of these laws and regulations could harm our reputation and business, or materially adversely affect our business, results of operations, financial condition and/or cash flows.
- Our failure to comply with trade compliance and economic sanctions laws and regulations of the United States and applicable international jurisdictions could materially adversely affect our reputation and results of operations.
- Current and future litigation against us, which may arise in the ordinary course of our business, could be costly and time consuming to defend.
- Our insurance coverage may not be sufficient to avoid material impact on our financial position resulting from claims or liabilities against us, and we may not be able to obtain insurance coverage on attractive terms, or at all, in the future.
- If we fail to perform our services in accordance with contractual requirements, regulatory standards and ethical considerations, we could be liable for significant costs or penalties and our reputation could be harmed.
- We derive a significant percentage of our revenues from a concentrated group of customers and the loss of more than one of our major customers could materially and adversely affect our business, results of operations and/or financial condition.
- We may need additional funding. If we are unable to raise additional capital on terms acceptable to us or at all or generate cash flows necessary to maintain or expand our operations, we may not be able to compete successfully.
- Our bookings might not accurately predict our future revenue, and we might not realize all or any part of the anticipated revenue reflect in our backlog.
- We rely upon third-party providers of cloud-based infrastructure to host our software solutions. Any disruption in the operations of these third-party providers, limitations on capacity or interference with our use could adversely affect our business, financial condition and results of operations.
- If we are not able to reliably meet our data storage and management requirements, or if we experience any failure or interruption in the delivery of our services over the internet, customer satisfaction and our reputation could be harmed and customer contracts may be terminated.
- Our software solutions utilize third-party open source software, and any failure to comply with the terms of one or more of these open source licenses could adversely affect our business, subject us to litigation and create potential liability.
- If our security measures are breached or unauthorized access to customer data is otherwise obtained, our solutions may be perceived as not being secure, customers may reduce the use of or stop using our solutions and we may incur significant liabilities.

- We are subject to numerous privacy and data security laws and related contractual requirements and our failure to comply with those obligations could cause us significant harm.
- We may be unable to adequately enforce or defend our ownership and use of our intellectual property and other proprietary rights.
- Third parties may initiate legal proceedings alleging that we are infringing, misappropriating or otherwise violating their intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business.
- Failure to comply with requirements to design, implement and maintain effective internal controls, or inability to timely remediate internal controls that are deemed ineffective could have a material adverse effect on our business and stock price.
- Our amended and restated certificate of incorporation provides, subject to limited exceptions, that the Court of Chancery of the State of Delaware and, to the extent enforceable, the federal district courts of the United States of America will be the sole and exclusive forums for certain stockholder litigation matters, which could limit our stockholder's ability to obtain a favorable judicial forum for disputes with us or our current and former directors, officers, employees or stockholders.
- Our board of directors are authorized to issue and designate shares of our preferred stock in additional series without stockholder approval.

Risks Related to Our Industry

Deceleration in, or resistance to, the acceptance of model-informed biopharmaceutical discovery and development by regulatory authorities or academic institutions could damage our reputation or reduce the demand for our products and services.

There has been a steady increase in the recognition by regulatory and academic institutions of the role that modeling and simulation can play in the biopharmaceutical development and approval process, as demonstrated by new regulations and guidance documents describing and encouraging the use of modeling and simulation in the biopharmaceutical discovery, development, testing and approval process, which has directly led to an increase in the demand for our services. Changes in government or regulatory policy, or a reversal in the trend toward increasing the acceptance of and reliance upon in silico data (trials, studies, or experiments conducted via computer or computer simulation) in the drug approval process, could decrease the demand for our products and services or lead regulatory authorities to cease use of, or to recommend against the use of, our products and services. This, in turn, could have a material adverse impact on our revenue and future growth.

Our software products are licensed by the FDA, Japan's Pharmaceuticals and Medical Devices Agency ("PMDA") and 15 other regulatory authorities, who use them in assessing new drug applications. These licenses, which accounted for 0.1 % of our annual revenue in 2021, are typically renewed on an annual basis, and there is no obligation for these regulatory authorities to renew these licenses at the same or any level. Although we do not believe that reduction or elimination of the use of any of our software products that are currently licensed by regulatory authorities would have a direct impact on the use of those products by our industry customers, it could diminish our reputation and negatively impact our ability to effectively market and sell our software products, particularly if such move were part of a wider reversal of government or regulatory acceptance of in silico data.

We also work closely with the global academic community on research, publications, and training of the next generation of biopharmaceutical scientists. Our software products are used in many academic institutions, often free of charge, where students, including PhD candidates, are first exposed to the types of tools and models that we offer. Upon graduating, these students often become employed by biopharmaceutical companies, where they continue to use our products and advocate for their continued use. If academic institutions decide to use competitive products, or develop their own biosimulation products, or reduce the exposure to biosimulation tools in general, familiarity with our products by the future generations of pharmacometricians and clinical pharmacologists will be diminished, which could ultimately result in a reduction in demand for our products.

We compete in a competitive and highly fragmented market.

The market for our biosimulation products and related services for the biopharmaceutical industry is competitive and highly fragmented. In biosimulation software, we compete with other scientific software providers, technology companies, in-house development by biopharmaceutical companies, and certain open source solutions. In the technology-driven services market, we compete with specialized companies, in-house teams at biopharmaceutical companies, academic and government institutions. In some standard biosimulation services, and in regulatory, and market access, we also compete with contract research organizations. Some of our competitors and potential competitors have longer operating histories in certain segments of our industry than we do and could have greater financial, technical, marketing, research and development and other resources. Some of our competitors offer products and services directed at more specific markets than those we target, enabling these competitors to focus a greater proportion of their efforts and resources on those specific markets. Some competing products are developed and made available at lower cost by government organizations and academic institutions, and these entities may be able to devote substantial resources to product development. Some clinical research organizations or technology companies may decide to enter into or expand their offerings in the biosimulation area, whether through acquisition or internal development. We also face competition from open source software initiatives, in which developers provide software and intellectual property free of charge, such as R and PK-Sim software. In addition, some of our customers spend significant internal resources in order to develop their own solutions. There can be no assurance that our current or potential competitors will not develop products, services or technologies that are comparable, or superior to, or will render obsolete, the products, services and technologies we offer. There can be no assurance that our

competitors will not adapt more quickly than we do to technological advances and customer demands, thereby increasing such competitors' market share relative to ours. Any material decrease in demand for our technologies or services may have a material adverse effect on our business, financial condition and results of operations.

Changes or delays in government regulation relating to the biopharmaceutical industry could decrease the need for some of the services we provide.

Governmental agencies throughout the world strictly regulate the biopharmaceutical development process. Our business involves helping biopharmaceutical companies strategically and tactically navigate the regulatory approval process. New or amended regulations are expected to result in higher regulatory standards and potentially additional revenues for companies that service these industries. However, some changes in regulations, such as a relaxation in regulatory requirements or the introduction of streamlined or expedited approval procedures, or an increase in regulatory requirements that we have difficulty satisfying or that make our regulatory strategy services less competitive, could eliminate or substantially reduce the demand for our regulatory services. Regulatory developments that could potentially increase demand for our services could also be postponed or not fully implemented. For example, we provide a technology-driven service for automated redaction of these large, complex documents. The EMA issued proposed rules that would require our customers to publish suitably redacted clinical reports submitted as part of a regulatory application. The EMA has since delayed implementation of this requirement, reducing demand for our document redaction technology and services. Any material decrease or delay in demand for our technologies or services may have a material adverse effect on our business, financial condition and results of operations.

We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, or changes to governmental regulation that may be required as a result of judicial decisions, either in the United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, our business may be harmed.

Reduction in research and development spending by our customers for a variety of reasons, as well as delays in the drug discovery and development process, may reduce demand for our products and services and negatively impact our results of operations and financial condition.

We provide biosimulation software platforms and services to the biopharmaceutical industry, both private and public companies as well as government and academic institutions. Because our products and services depend on our customers' research and development expenditures, our revenues may be materially negatively affected by any economic, competitive, regulatory, demand, or other market impact that decreases our customers' profitability or causes them to decrease or delay research and development spend. In such an event, our revenues may be reduced through increased downward pricing pressure, reduction in the scope of projects, delays or cancellations of ongoing projects, or our customers' shifting away from using third parties for their modeling and simulation work. Our customers' expenses could continue to increase as a result of the higher costs of developing more complex drugs and biologics and complying with more onerous government regulations. Furthermore, our customers finance their research and development spending from both private and public sources, including the capital markets. As a result, our revenues and financial performance may be adversely impacted if our customers are unable to obtain sufficient capital on acceptable terms to finance their research and development spending. Government and university-based funding of scientific research can vary for a number of reasons, including general economic conditions, political priorities, changes in the number of students and other demographic changes.

Our customers' profitability could decline as a result of efforts by government and third-party payors to reduce the cost of healthcare. Governments worldwide have increased efforts to expand healthcare coverage while at the same time curtailing and better controlling the increasing costs of healthcare. If cost-containment efforts or other measures substantially change existing insurance models and limit our customers' profitability, our customers may decrease research and development spending, which could decrease the demand for our services and materially adversely affect our growth prospects. In addition, industry trends, economic factors, regulatory developments, patent protection and political and other events and circumstances that affect the biopharmaceutical industry, such as volatility or declines in securities markets limiting capital and liquidity, decreased government funding of scientific research, or other circumstances that decrease our customers' research and development spending also affect us.

Delays in the biopharmaceutical development cycle, particularly related to clinical trials being delayed or canceled, such as those caused by the recent COVID-19 pandemic, could also impact the demand or timing for our products and services.

Furthermore, our financial success depends upon the creditworthiness and ultimate collection of amounts due from our customers. If we are not able to collect amounts due from our customers in a timely fashion due to funding or liquidity challenges or for any other reason, we may be required to write-off significant accounts receivable and recognize bad debt expenses, which could materially and adversely affect our operating results. All of these events could have a material adverse effect on our business, results of operations or financial condition.

Consolidation within the biopharmaceutical industry may reduce the pool of potential customers for our products and services or reduce the number of licenses for our software products.

A significant portion of our customer base consists of biopharmaceutical companies, and our revenue is dependent upon expenditures by these customers. Consolidation through mergers or contraction through business failures within the biopharmaceutical industry may reduce the number of potential customers, particularly larger customers, for our products and services. Consolidation of major biopharmaceutical companies could result in consolidation of software licenses used by those companies, reduction of the number of individual user licenses, or increased pressure to negotiate price discounts or other terms for service that are less favorable to us, which may have a material adverse effect on our revenue and financial condition. Personnel redundancies and layoffs by merged companies to achieve deal synergies would result in a commensurate reduction in total users of our software, reducing the license fees we charge based on number of users.

As customers increase their utilization of our products and services, we may be subject to additional pricing pressures.

One of our strategic goals is to increase the breadth and utilization of products and services we provide to our existing customers, such as increasing the number of user licenses for our software products, selling licenses for new software products and expanding the number and scope of services we provide to individual customers. As the total annual expenditure from a particular customer increases, we may experience pricing pressure, often from the customer's procurement department, in the form of requests for discounts or rebates, price freezes and less favorable payment terms. This could have an adverse impact on our profitability.

Risks Related to Our Business

Our continued revenue growth depends on our ability to successfully enter new markets, increase our customer base and expand our relationship and the products and services we provide to our existing customers.

Our products and services are used primarily by modeling and simulation specialists in pharmaceutical, biotechnology, and government research or regulatory organizations. We have relationships with many large companies in the biopharmaceutical sector, and part of our growth strategy entails deriving more revenues from these existing customers by expanding their use of our existing and new products and services. Our ability to increase revenues with existing customers may be limited without significant investment in marketing our existing products and services or developing new products, which could be time-consuming and costly and may not be successful. We are also focused on increasing the number of emerging or smaller biotechnology customers that we serve. These small companies are increasingly responsible for much of the discovery and development of new molecules and treatments, and their share of the total industry research and development discovery and development dollars is rapidly growing. Attracting these smaller customers may require us to expend additional resources on targeted marketing, as they may not be as familiar with our company or products. And although these small biotechnology companies tend to use third parties such as Certara for many of their development activities, these smaller companies also tend to be less financially secure. If their products are not successful or they have difficulty raising sufficient investment capital, they may not be able to timely or fully pay for our services, or they may terminate or decrease the scope of projects for which they use our products and services, which could adversely impact our revenues.

Our strategy also includes expanding into new markets, new geographies, and new areas within our existing markets, either organically or by acquiring other companies in these markets. If our strategies are not executed successfully, our products and services may not achieve market acceptance or penetration in targeted new departments within our existing customers

or new customers. We cannot guarantee that we will be able to identify new biosimulation or regulatory and market access technologies of interest to our customers, or develop or acquire them in a timely fashion. Even if we are able to identify and develop new technologies and biosimulation tools of interest, we may not be able to negotiate license agreements on acceptable terms, or at all. Some of our products, such as our QSP models, require significant time and investment to develop to a point where they can achieve market acceptance, and we may not be able to develop them at a rate that matches market demand. We may also face more significant pricing pressure as we expand geographically and our customer profile evolves. For example, smaller biotechnology companies, or companies based in countries that have less developed economies, may not be able to afford our products and services at our customary rates. If we are unable to develop or acquire new services and products and/or create demand for those newly developed services and products, accelerate the development of products where there is a market demand, or maintain or increase our historic pricing levels, our future business, results of operations, financial condition and cash flows could be adversely affected.

Our business may be subject to risks arising from natural disasters and epidemic diseases, including the ongoing COVID 19 pandemic.

We may be subject to risks related to natural disasters and public health crises, such as the ongoing global COVID 19 pandemic.

The COVID 19 pandemic, and the numerous variants that have emerged in the last year, such as the Delta and Omicron variants, have also had a significant and sustained negative impact on the global economy and a negative impact on many of our customers. Some of our customers have experienced or may in the future be adversely impacted by supply chain interruptions, disruptions or delays to pipeline development and clinical trials, costs associated with the COVID 19 pandemic and interruptions or delays in regulatory approvals due to the impact of the COVID 19 pandemic on the operations of certain regulatory authorities. These and other adverse impacts on our customers and economic conditions related to the COVID 19 pandemic may cause our customers to delay or cancel projects or significantly scale back their operations or research and development spending and limit the use of third parties, which could have a material adverse effect on our business.

We have undertaken several actions to mitigate and/or limit the spread of COVID 19 amongst our employees, including restricting employee travel, closing our offices in compliance with local guidelines and, when reopening offices, implementing a number of safety measures, such as requiring U. S. employees to be fully vaccinated before returning to the office, increasing sanitation, use of personal protective equipment, and limiting the number of employees at each location. However, even if we follow what we believe to be best practices, we may not be able to prevent the transmission of SARS-CoV 2 between employees. Any incidents of actual or perceived transmission may expose us to liability claims, adversely impact employee productivity and morale, and result in negative publicity and reputational harm.

Travel restrictions and the cancellation of industry conferences have significantly limited face-to-face interactions with existing and potential customers, which have traditionally been an effective avenue for developing new business. If our scientists and consultants are not able to effectively communicate and interact with our existing and potential customers remotely, a prolonged period of limited direct contact with customers could translate into reduced bookings and negatively impact our revenue generation.

In addition to the current COVID 19 pandemic, our business could be negatively impacted by other natural disasters, such as new disease epidemics, significant weather events, the outbreak of war or acts of terrorism, such as the conflict between Russia and Ukraine, or other “acts of God,” each of which may be exacerbated by the effects of global climate change. We are a global company with offices in many countries. Disruptions in the infrastructure, either on a local or global scale, caused by these types of events could adversely affect our ability to serve our customers.

Although we have disaster recovery plans, carry business interruption insurance policies and typically have provisions in our contracts that protect us in certain force majeure type events, our coverage might not be adequate to compensate us for all losses that may occur.

Delays or defects in the release of new or enhanced software or other biosimulation tools may result in increased cost to us, delayed market acceptance of our products, diminished demand for our products, delayed or lost revenue, and liability.

Market acceptance of our products depends upon the continuous, effective and reliable operation of our software and other biosimulation tools and models. New or enhanced products or services can require long development and testing periods, which may result in delays in scheduled introduction. Our software solutions and biosimulation tools and models are inherently complex and may contain defects or errors. The risk of errors is particularly significant when a new product is first introduced or when new versions or enhancements of existing software solutions are released. Although we extensively test and conduct quality control on each new or enhanced biosimulation product before it is released to the market, there can be no assurance that significant errors will not be found in existing or future releases. As a result, in the months following the introduction of certain releases, we may need to devote significant resources to correct these errors. There can be no assurance, however, that all of these errors can be corrected. Many of our customers also require that new versions of our software be internally validated before implementing it, which can result in implementation delays or the decision to skip smaller updates altogether. Any errors, defects, disruptions or other performance problems with our products could hurt our reputation and may damage our customers' businesses. Any delays in the release schedule for new or enhanced products or services may delay market acceptance of these products or services and may result in delays in new customer orders for these new or enhanced products or services or the loss of customer orders, which may have a material adverse effect on our business, financial condition and results of operations.

To the extent that defects or errors cause our software or other biosimulation tools to malfunction and our customers' use of our products is interrupted, or the data derived from the use of our products is incorrect or incomplete, our customers may delay or withhold payment to us, cancel their agreements with us or elect not to renew, make service credit claims, warranty claims or other claims against us, and we could lose future sales. The occurrence of any of these events could result in diminishing demand for our software, a reduction of our revenues, an increase in collection cycles for accounts receivable, require us to increase our warranty provisions or incur the expense of litigation or substantial liability.

If our existing customers do not renew their software licenses, do not buy additional solutions from us or renew at lower prices, our business and operating results will suffer.

We expect to continue to derive a significant portion of our software revenues from the renewal of existing license agreements. As a result, maintaining the renewal rate of our existing customers and selling additional software solutions to them is critical to our future operating results. Factors that may affect the renewal rate for our customers and our ability to sell additional solutions to them include:

- the price, performance and functionality of our software solutions;
- the availability, price, performance and functionality of competing products;
- the effectiveness of our professional services;
- ability to develop complementary software solutions, applications and services;
- the stability, performance and security of our technological infrastructure; and
- the business environment of our customers.

We deliver our software through either (i) a product license that permits our customers to install the software solution directly onto their own in-house hardware and use it for a specified term, or (ii) a subscription that allows our customers to access the cloud-based software solution for a specified term. Our customers have no obligation to renew their product licenses or subscriptions for our software solutions after the license term expires, which are typically between one and three years, and some of our contracts may be terminated or reduced in scope either immediately or upon notice. In addition, our customers may negotiate terms less advantageous to us upon renewal, which may reduce our revenues from these customers.

Our customers depend on our support organization to resolve technical issues relating to our solutions, as our software requires expert usage to fully exploit its capabilities. Any failure to offer high-quality technical support, or a market perception that we do not offer high-quality support, could adversely affect our renewal rates and our ability to sell our additional solutions to existing or to sell to prospective customers. Factors that are not within our control may also contribute to a reduction in our software revenues. For instance, our customers may reduce the number of their employees who are engaged in research and who would have use of our software, which would result in a corresponding reduction in the number of user licenses needed for some of our solutions and thus a lower aggregate renewal fee. The loss, reduction in scope or delay of a large contract, or the loss or delay of multiple contracts, could materially adversely affect our business.

Our future operating results also depend, in part, on our ability to sell new software solutions and licenses to our existing customers. The willingness of existing customers to license our software will depend on our ability to scale and adapt our existing software solutions to meet the performance and other requirements of our customers, which we may not do successfully. If our customers fail to renew their agreements, renew their agreements upon less favorable terms or at lower fee levels or fail to purchase new software solutions and licenses from us, our revenues may decline and our future revenues may be constrained. Furthermore, our sales process is dependent on the reputation of our solutions and business and on positive recommendations from our existing customers. Any dissatisfaction from existing customers may adversely impact our ability to sell our solutions to new customers.

Our customers may delay or terminate contracts, or reduce the scope of work, for reasons beyond our control, or we may underprice or overrun cost estimates with our fixed-fee contracts, potentially resulting in financial losses.

Many of our technology-driven service contracts may be terminated by the customer at its discretion immediately or after a short notice period without penalty. Customers terminate, delay or reduce the scope of these types of contracts for a variety of reasons, including but not limited to:

- lack of available funding or financing;
- mergers or acquisitions involving the customer;
- a change in customer priorities;
- Covid-19 impact on client trial operations;
- delay or termination of a specific product candidate development program; and
- the customer decides to shift business to a competitor or to use internal resources.

As a result, contract terminations, delays and reductions in scope occur regularly in the normal course of our business. However, the delay, loss or reduction in scope of a large contract or multiple smaller contracts could result in under-utilization of our personnel, a decline in revenue and profitability and adjustments to our bookings, any or all of which could have a material adverse effect on our business, results of operations, financial condition and/or cash flows.

Many of our contracts with customers also provide for services on a fixed-price or fee-for-service with a cap basis. Accordingly, we bear the financial risk if we initially underprice our contracts or otherwise overrun our cost estimates. In these situations, we attempt to revise the scope of activity from the contract specifications and negotiate contract modifications shifting the additional cost to the customer, but are not always successful. If we fail to adequately price our contracts or if we experience significant cost overruns (including direct and indirect costs such as pass-through costs), or if we are delayed in, or fail to, execute contract modifications with customers increasing the scope of activity, our results of operations could be materially adversely affected. From time to time, we have had to commit unanticipated resources to complete fixed-fee projects, resulting in lower margins and profitability on those projects. We might experience similar situations in the future, which could have a material adverse impact on our results of operations and cash flows.

We depend on key personnel and may not be able to retain these employees or recruit additional qualified personnel, which could harm our business.

Our success depends to a significant extent on the continued services of our senior management and other key contributors throughout our business. As of December 31, 2021, 352 of our employees held PhDs, PharmDs, or MDs. It is challenging to attract and retain critical and qualified employees because of the specialized scientific nature of our business and significant competition for qualified personnel in the biopharmaceutical industry. Many of our scientists also play a significant role in marketing and selling our products and services to new and existing customers. If any of our senior scientists or members of senior management team, such as our CEO, CFO or division presidents, do not continue in their present positions, our operations could be disrupted. Compensation for our employees makes up our most significant fixed cost. Unexpected revenue shortfalls in the future and rapid wage inflation may make it difficult for us to retain all of our employees. The loss of any key employee, or our inability to continue to recruit, retain and motivate key personnel, replace departed personnel in a timely fashion, or train our scientists to develop new business, may adversely impact our ability to compete effectively and grow our business and negatively affect our ability to meet our short and long-term financial and operational objectives.

We have government customers and have received government grants, which subject us to risks including early termination, audits, investigations, sanctions, or penalties.

We derive limited revenue from contracts with U. S. government, including the FDA and the Center for Disease Control and Prevention within the Department of Health and Human Services. We have also accepted limited grant funds from governmental entities, whereby we are reimbursed for certain expenses incurred, subject to our compliance with the specific requirements of the applicable grant, including rigorous documentation requirements. We may enter into further contracts with the U.S. or foreign governments in the future, or accept additional grant funds. These subject us to statutes and regulations applicable to companies doing business with the government. These types of contracts customarily contain provisions that give the government substantial rights and remedies, many of which are not typically found in commercial contracts and which are unfavorable to contractors, including provisions that allow the government to unilaterally terminate or modify our federal government contracts, in whole or in part, at the government's convenience or in the government's best interest, including if funds become unavailable to the applicable government agency. Under general principles of government contracting law, if the government terminates a contract for convenience, the terminated company may generally recover only its incurred or committed costs and settlement expenses and profit on work completed prior to the termination. If the government terminates a contract for default, the defaulting company may be liable for any extra costs incurred by the government in procuring undelivered items from another source. Further, the laws and regulations governing the procurement of goods and services by the U.S. government provide procedures by which other bidders and interested parties may challenge the award of a government contract at the U.S. Government Accountability Office ("GAO") or in federal court. If we are awarded a government contract, such challenges or protests could be filed even if there are not any valid legal grounds on which to base the protest. If any such protests are filed, the government agency may decide to suspend our performance under the contract while such protests are being considered by the GAO or the applicable federal court, thus potentially delaying delivery of payment.

In addition, government contracts and grants normally contain additional requirements that may increase our costs of doing business, reduce our profits, and expose us to liability for failure to comply with these terms and conditions. These requirements include, for example:

- compliance with complex regulations for procurement, formation, administration, and performance of government contracts under the Federal Acquisition Regulations, agency-specific regulations supplemental to the Federal Acquisition Regulations, and regulations specific to the administration of grants by the U.S. government.
- specialized disclosure and accounting requirements unique to government contracts and grants.
- mandatory financial and compliance audits that may result in potential liability for price or cost adjustments, recoupment of government funds after such funds have been spent, civil and criminal penalties, or administrative sanctions such as suspension or debarment from doing business with the U.S. government.
- public disclosures of certain contract, grant, and company information; and
- mandatory socioeconomic compliance requirements, including labor requirements, non-discrimination and affirmative action programs and environmental compliance requirements.

Government contracts and grants are also generally subject to greater scrutiny by the government, which can unilaterally initiate reviews, audits and investigations regarding our compliance with government contract and grant requirements. In addition, if we fail to comply with government contract laws, regulations and contract or grant requirements, our contracts and grants may be subject to termination or suspension, and we may be subject to financial and/or other liability under our contracts or under the Federal Civil False Claims Act. The False Claims Act's "whistleblower" provisions allow private individuals, including present and former employees, to sue on behalf of the U.S. government. The False Claims Act statute provides for treble damages and other penalties and, if our operations are found to be in violation of the False Claims Act, we could face other adverse action, including suspension or prohibition from doing business with the United States government. Any penalties, damages, fines, suspension, or damages could adversely affect our ability to operate our business and our financial results.

Our recent growth rates may not be sustainable or indicative of future growth.

We have experienced significant growth in recent years. Revenue increased from $243.5 million for 2020 to $286.1 million for 2021. Our historical rate of growth may not be sustainable or indicative of our future rate of growth. We believe that our continued growth in revenue, as well as our ability to improve or maintain margins and profitability, will depend upon, among other factors, our ability to address the challenges, risks and difficulties described elsewhere in this "Risk Factors" section and the extent to which our various product offerings grow and contribute to our results of operations. We cannot provide assurance that we will be able to successfully manage any such challenges or risks to our future growth. In addition, our customer base may not continue to grow or may decline due to a variety of possible risks, including increased competition, changes in the regulatory landscape and the maturation of our business. Any of these factors could cause our revenue growth to decline and may adversely affect our margins and profitability. Failure to continue our revenue growth or improve margins would have a material adverse effect on our business, financial condition and results of operations. You should not rely on our historical rate of revenue growth as an indication of our future performance.

We regularly evaluate potential acquisitions of other companies or technologies, which could divert our management's attention, result in additional dilution to our stockholders, and otherwise disrupt our operations and adversely affect our operating results.

We have acquired multiple businesses and technologies in the past and we regularly evaluate opportunities to acquire or invest in businesses, solutions or technologies that we believe could complement or expand our solutions, enhance our technical capabilities or otherwise offer growth opportunities. The pursuit of potential acquisitions may divert the attention of management and cause us to incur various expenses in identifying, investigating and pursuing suitable acquisitions, whether or not they are consummated.

If we acquire additional businesses, we may not be able to integrate the acquired personnel, operations and technologies successfully, effectively manage the combined business following the acquisition or preserve the operational synergies between our business units that we underwrite at the time of the acquisition. We cannot assure that following any acquisition we would achieve the expected synergies to justify the transaction, due to a number of factors, including:

- inability to integrate or benefit from acquired technologies or services in a profitable manner;
- unanticipated costs or liabilities associated with the acquisition;
- incurrence of acquisition-related costs;
- difficulty integrating the accounting systems, operations and personnel of the acquired business;
- difficulties and additional expenses associated with supporting legacy products and hosting infrastructure of the acquired business;
- difficulty converting the customers of the acquired business onto our solutions and contract terms, including disparities in the revenues, licensing, support or professional services model of the acquired company;
- diversion of management's attention from other business concerns;
- adverse effects to our existing business relationships with business partners and customers as a result of the acquisition;

- the potential loss of key employees;
- use of resources that are needed in other parts of our business; and
- use of substantial portions of our available cash to consummate the acquisition.

Furthermore, acquired businesses may change or increase the risks to which we are exposed. For example, in October 2021 we acquired Pinnacle, whose software is used by the FDA and PMDA to validate compliance with the Clinical Data Interchange Standards Consortium (CDISC) standards. As a result, this acquisition increased our exposure to risks related to changes in the FDA's or the PMDA's regulatory standards and risks related to government customers.

In addition, a significant portion of the purchase price of companies we acquire may be allocated to acquired goodwill and other intangible assets, which must be assessed for impairment at least annually. In the future, if our acquisitions do not yield expected returns, we may be required to take charges to our operating results based on this impairment assessment process, which could adversely affect our results of operations.

Acquisitions could also result in dilutive issuances of equity securities or the incurrence of debt, which could adversely affect our operating results. In addition, if an acquired business fails to meet our expectations, our operating results, business and financial position may suffer.

Our estimated addressable market is subject to inherent challenges and uncertainties. If we have overestimated the size of our addressable market or the various markets in which we operate, our future growth opportunities may be limited.

Our TAM is based on publicly available third-party market research and internal estimates regarding the size of our markets, and is subject to significant uncertainty and is based on assumptions that may not prove to be accurate. We base the TAM for our business off our current core markets, biosimulation, regulatory science, and market access. These estimates may change or prove to be inaccurate. While we believe the information on which we base our TAM is generally reliable, such information is inherently imprecise. In addition, our expectations, assumptions and estimates of future opportunities are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, including those described herein. If third-party or internally generated data prove to be inaccurate or we make errors in our assumptions based on that data, our future growth opportunities may be affected. If our TAM, or the size of any of the various markets in which we operate, proves to be inaccurate, our future growth opportunities may be limited and there could be a material adverse effect on our prospects, business, financial condition and results of operations.

We are subject to risks associated with the operation of a global business.

We derive a significant portion of our total revenue from our operations in international markets. During the years ended December 31, 2021 and 2020, 29% and 26%, respectively, of our revenues were transacted in foreign currencies, the majority of which included the British pound sterling, the euro and Japanese yen. Our global business may be affected by local economic conditions, including inflation, recession and currency exchange rate fluctuations. Changes in the value of the U.S. dollar relative to other currencies could result in material foreign currency exchange rate fluctuations and, as a result, our net earnings could be materially adversely affected. In addition, political and economic changes, including international conflicts and terrorist acts, throughout the world may interfere with our or our customers' activities in particular locations and result in a material adverse effect on our business, financial condition and operating results. Although we do not believe the current conflict between Russia and Ukraine poses any immediate material impact to our business, if the conflict intensifies or expands beyond Ukraine, it could have an adverse impact on our business, particularly our operations in Poland and our ability to use consultants in that that region of the world. We could also experience a delay or cancellation of work orders to the extent they rely on clinical trials being conducted in Ukraine. Potential trade restrictions, exchange controls, adverse tax consequences and legal restrictions may affect our revenue from customers located outside the United States and the repatriation of funds into the United States. Also, we could be subject to unexpected changes in regulatory requirements, the difficulties of compliance with a wide variety of foreign laws and regulations, potentially negative consequences from changes in or interpretations of U.S. and foreign tax laws, import and export licensing requirements and longer accounts receivable cycles in certain foreign countries. Foreign currency exchange rate hedges, transactions, re-measurements, or translations could also materially impact our financial results. These risks, individually or in the aggregate, could have an adverse effect on our results of operations and financial.

We are subject to the FCPA and the Bribery Act and similar anti-corruption laws and regulations in other countries. Violations of these laws and regulations could harm our reputation and business, or materially adversely affect our business, results of operations, financial condition and/or cash flows.

We operate in numerous countries around the world and are subject to the FCPA, the Bribery Act and similar anti-bribery laws in the countries in which we operate. Our business involves sales to government and state-owned agencies and brings us and others acting on our behalf, into contact with government officials around the world. The FCPA and the Bribery Act prohibit us and our officers, directors, employees and third parties acting on our behalf, including agents, from corruptly offering, promising, authorizing or providing anything of value to a "foreign official" for the purposes of influencing official decisions or obtaining or retaining business or otherwise obtaining favorable treatment. The FCPA further requires us to make and keep books, records and accounts that accurately reflect transactions and dispositions of assets and to maintain a system of adequate internal accounting controls. The Bribery Act also prohibits "commercial" bribery and accepting bribes.

Although our officers, directors, employees, distributors, and agents are required to comply with these laws, we cannot be sure that our internal policies and procedures will always protect us from liability for violations of these laws committed by persons associated with us, including our employees or third parties acting on our behalf. Violations of anti-corruption laws, or even allegations of such violations, could disrupt our business and result in a material adverse effect on our reputation, business, results of operations, financial condition and/or cash flows. For example, violations may result in criminal or civil penalties, disgorgement of profits, related stockholder lawsuits, debarment from government contracting and other remedial measures.

Our failure to comply with trade compliance and economic sanctions laws and regulations of the United States and applicable international jurisdictions could materially adversely affect our reputation and results of operations.

We must operate our business in compliance with applicable economic and trade sanctions laws and regulations, such as those administered and enforced by the U.S. Department of Treasury's Office of Foreign Assets Control, the U.S. Department of State, the U.S. Department of Commerce, the United Nations Security Council and other relevant sanctions authorities. Our global operations expose us to the risk of violating, or being accused of violating, economic and trade sanctions laws and regulations. Our failure to comply with these laws and regulations may expose us to reputational harm as well as significant penalties, including criminal fines, imprisonment, civil fines, disgorgement of profits, injunctions and debarment from government contracts, as well as other remedial measures. Investigations of alleged violations can be expensive and disruptive. Despite our compliance efforts and activities we cannot assure compliance by our employees or

representatives for which we may be held responsible, and any such violation could materially adversely affect our reputation, business, financial condition and results of operations.

Current and future litigation against us, which may arise in the ordinary course of our business, could be costly and time consuming to defend.

We are subject to claims that arise in the ordinary course of business, such as claims in connection with commercial disputes, employment claims made by our current or former employees, or claims brought by third-parties for failure to adequately protect their personal data. Third parties may in the future assert intellectual property rights to technologies that are important to our business and demand back royalties or that we license their technology. Litigation may result in substantial costs and may divert management's attention and resources, which may seriously harm our business, overall financial condition and operating results. Insurance may not cover such claims, may not be sufficient for one or more of such claims and may not continue to be available on terms acceptable to us. A claim brought against us that is uninsured or underinsured could result in unanticipated costs, negatively affecting our business, financial condition and results of operations.

Our insurance coverage may not be sufficient to avoid material impact on our financial position resulting from claims or liabilities against us, and we may not be able to obtain insurance coverage on attractive terms, or at all, in the future.

We maintain insurance coverage for protection against many risks of liability, including directors and officers liability, professional errors and omissions, breach of fiduciary duty, and cybersecurity risks. The extent of our insurance coverage is under continuous review and is modified as we deem it necessary. Despite this insurance, it is possible that claims or liabilities against us may have not be fully insured, or our insurance carriers may contest coverage, which could have a material adverse impact on our financial position or results of operations. In addition, we may not be able to obtain any insurance coverage, or adequate insurance coverage on attractive terms, or at all, when our existing insurance coverage expires and the cost of obtaining such insurance coverage may materially increase.

If we fail to perform our services in accordance with contractual requirements, regulatory standards and ethical considerations, we could be liable for significant costs or penalties and our reputation could be harmed.

The services we provide to biopharmaceutical companies and other customers are complex and subject to contractual requirements, regulatory standards and ethical considerations. For example, some of our services must adhere to regulatory requirements of the FDA governing our activities relating to preclinical studies and clinical trials, including GLP and GCP. Additionally, we are subject to compliance with FDA's regulations set forth in part 11 of title 21 of the Code of Federal Regulations, which relates to the creation, modification, maintenance, storage, retrieval, or transmittal of electronic records submitted to the FDA. FDA may also issue or finalize guidance documents that may have implications for our customers and our products, platforms, and services. We may be subject to inspection by regulatory authorities in connection with our customers' marketing applications and other regulatory submissions. If we fail to perform our services in accordance with regulatory requirements, regulatory authorities may take action against us or our customers for failure to comply with applicable regulations governing the development and testing of therapeutic products. Regulatory authorities may also disqualify certain data or analyses from consideration in connection with applications for regulatory approvals, which would result in our customers not being able to rely on our services in connection with their regulatory submissions and may subject our customers to additional or repeat clinical trials and delays in the development and regulatory approval process. Mistakes in providing services to our customers, such as dosing models, could affect medical decisions for patients in clinical trials and create liability for personal injury. Such actions may include sanctions, such as warning or untitled letters, injunctions or failure of such regulatory authorities to grant marketing approval of products, delay, suspension or withdrawal of approvals, license revocation, loss of accreditation, product seizures or recalls, operational restrictions, civil or criminal penalties or prosecutions, damages or fines. Customers may also bring claims against us for breach of our contractual obligations or errors in the outcomes of our products or services, may terminate their contracts with us and/or may choose not to award further work to us. Any such action could have a material adverse effect on our reputation, business, financial condition and results of operations.

We derive a significant percentage of our revenues from a concentrated group of customers and the loss of more than one of our major customers could materially and adversely affect our business, results of operations and/or financial condition.

Our ten largest customers accounted for 29% and 28% of revenues for the years ended December 31, 2021 and 2020, respectively. The loss of any of our major customers could have a material adverse effect on our results of operations and financial condition. We may not be able to maintain our customer relationships, and our customers may delay payment under, or fail to renew, their agreements with us, which could adversely affect our business, results of operations or financial condition. Any reduction in the amount of revenues that we derive from these customers, without an offsetting increase in new sales to other customers, could have a material adverse effect on our operating results. A significant change in the liquidity or financial position of our customers could also have a material adverse effect on the collectability of our accounts receivable, our liquidity, and our future operating results.

We may need additional funding. If we are unable to raise additional capital on terms acceptable to us or at all or generate cash flows necessary to maintain or expand our operations, we may not be able to compete successfully, which would harm our business, results of operations, and financial condition.

We expect to devote substantial financial resources to our ongoing and planned activities, including the continued investment in our biosimulation software platform.

As of December 31, 2021, we had cash and cash equivalents of $185.8 million. We believe that our existing cash and cash equivalents will be sufficient to fund our operations and capital expenditure requirements for an extended period. However, we have based this estimate on assumptions that may prove to be wrong, and our operating plans may change as a result of many factors currently unknown to us. As a result, we could deplete our capital resources sooner than we currently expect.

Our future capital requirements will depend on many factors, including:

- the growth of our revenue;
- the growth of our employee base;
- the timing and launch of new products;
- the continued expansion of sales and marketing activities; and
- mergers and acquisitions of technologies or services complementing or extending our biosimulation, regulatory science and market access businesses.

In the event that we require additional financing, we may not be able to raise such financing on terms acceptable to us or at all. In addition, we may seek additional capital due to favorable market conditions or strategic considerations, even if we believe we have sufficient funds for our current or future operating plans. If we are unable to raise additional capital on terms acceptable to us or at all or generate cash flows necessary to maintain or expand our operations and invest in our computational platform, we may not be able to compete successfully, which would harm our business, operations, and financial condition.

Our bookings might not accurately predict our future revenue, and we might not realize all or any part of the anticipated revenue reflected in our backlog.

Our bookings represent anticipated revenue for work not yet completed or performed under a signed contract or purchase order where there is sufficient or reasonable certainty about the customer’s ability and intent to fund and commence the software or services. Bookings vary from period to period depending on numerous factors, including sales performance and the overall health of the biopharmaceutical industry, among others. Once work begins, we recognize direct revenue

over the life of the contract based on our performance of services under the contract. Contracts may be terminated or delayed by our customers for reasons beyond our control. To the extent projects are delayed, the anticipated timing of our direct revenue could be materially affected.

In the event a customer terminates a contract, we are generally entitled to be paid for services rendered through the termination date and for services provided in winding down the project. However, we are generally not entitled to receive the full amount of direct revenue reflected in our bookings in the event of a contract termination. A number of factors may affect bookings and the direct revenue generated from our bookings, including:

- the size, complexity and duration of solutions;
- changes in the scope of work during the course of a project; and
- the cancellation or delay of a solution.

Our bookings for the year ended December 31, 2021 were $341.7 million compared to bookings of $288.3 million for the year ended December 31, 2020. Although an increase in bookings will generally result in an increase in future revenue to be recognized over time (depending on future contract modifications, contract cancellations and other adjustments), an increase in bookings at a particular point in time does not necessarily correspond to an increase in revenues during a particular period. The timing and extent to which bookings will result in direct revenue depends on many factors, including the timing of commencement of work, the rate at which we perform services, scope changes, cancellations, delays, receipt of regulatory approvals and the nature, duration, size, complexity and phase of the studies. In addition, delayed projects remain in bookings until they are canceled. As a result of these factors, our bookings are not necessarily a reliable indicator of future direct revenue and we might not realize all or any part of the revenue from the authorizations in bookings as of any point in time.

Risks Related to Intellectual Property, Information Technology and Data Privacy

We rely upon third-party providers of cloud-based infrastructure to host our software solutions. Any disruption in the operations of these third-party providers, limitations on capacity or interference with our use could adversely affect our business, financial condition, and results of operations.

We outsource substantially all of the infrastructure relating to our hosted software solutions to third-party hosting services. Customers of our hosted software solutions need to be able to access our software platform at any time, without interruption or degradation of performance, and we provide them with service-level commitments with respect to uptime. Our hosted software solutions depend on protecting the virtual cloud infrastructure hosted by third-party hosting services by maintaining its configuration, architecture, features and interconnection specifications, as well as the information stored in these virtual data centers, which is transmitted by third-party internet service providers. Any limitation on the capacity of our third-party hosting services could impede our ability to onboard new customers or expand the usage of our existing customers, which could adversely affect our business, financial condition and results of operations. In addition, any incident affecting our third-party hosting services' infrastructure that may be caused by cyber-attacks, natural disasters, fire, flood, severe storm, earthquake, power loss, telecommunications failures, terrorist or other attacks and other similar events beyond our control could negatively affect our cloud-based solutions. Work-from-home and other measures introduced to mitigate the spread of the COVID 19 pandemic have impacted our third-party vendors by increasing operational challenges and risks, including vulnerabilities to cybersecurity and information technology infrastructure threats. A prolonged service disruption affecting our cloud-based solutions for any of the foregoing reasons would negatively impact our ability to serve our customers and could damage our reputation with current and potential customers, expose us to liability, cause us to lose customers or otherwise harm our business. We may also incur significant costs for using alternative equipment or taking other actions in preparation for, or in reaction to, events that damage the third-party hosting services we use.

In the event that our service agreements with our third-party hosting services are terminated, or there is a lapse of service, elimination of services or features that we utilize, interruption of internet service provider connectivity or damage to such facilities, we could experience interruptions in access to our platform as well as significant delays and additional expense

in arranging or creating new facilities and services and/or re-architecting our hosted software solutions for deployment on a different cloud infrastructure service provider, which could adversely affect our business, financial condition and results of operations.

If we are not able to reliably meet our data storage and management requirements, or if we experience any failure or interruption in the delivery of our services over the internet, customer satisfaction and our reputation could be harmed and customer contracts may be terminated.

As part of our current business model, the portion of our software that is delivered over the internet as SaaS is increasing, and we store and manage significant data for our customers, resulting in substantial information technology infrastructure and ongoing technological challenges, which we expect to continue to increase over time. If we do not reliably meet these data storage and management requirements, or if we experience any failure or interruption in the delivery of our services over the internet, customer satisfaction and our reputation could be harmed, leading to reduced revenues and increased expenses. Our hosting services are subject to service-level agreements and, in the event that we fail to meet guaranteed service or performance levels, we could be subject to customer credits or termination of these customer contracts. If the cost of meeting these data storage and management requirements increases, our results of operations could be harmed.

Our software solutions utilize third-party open source software, and any failure to comply with the terms of one or more of these open source licenses could adversely affect our business, subject us to litigation and create potential liability.

Some of our software solutions utilize software covered by open source licenses, and we expect to continue to incorporate open source software in our solutions in the future. Open source software is typically freely accessible, usable and modifiable, and is used by our development team in an effort to reduce development costs and speed up the development process. Use of open source software also in some respects entails greater risks than use of third party commercial software, as open source licensors generally do not provide warranties or other contractual protections regarding infringement claims or the quality of the code, including with respect to security vulnerabilities.

Although we have processes intended to fully comply with all license requirements in our software, certain open source software licenses require, among other things, that a licensor that distributes the open source software as a component of the licensor's proprietary software, to provide or offer to provide to the customer-licensee part or all of the source code to the licensor's proprietary software. If the owner of the copyright of the relevant open source software were to allege that we had not complied with the conditions of one or more of these licenses, we could be required to incur significant legal expenses defending against such allegations and could be subject to significant damages, enjoined from the sale of our solutions that contain the open source software and required to comply with onerous conditions or restrictions on these solutions, which could disrupt the distribution and sale of these solutions. Litigation or other enforcement actions initiated by a copyright owner could have a negative effect on our business, financial condition and results of operations, or require us to devote additional research and development resources to change our solutions. Moreover, we could effectively be required to publicly release the affected portions of our source code, re-engineer all or a portion of our solutions or otherwise be limited in the licensing of our solutions, each of which could reduce or eliminate the value of our solutions. Disclosing our proprietary source code could allow our competitors to create similar products with lower development effort and time and ultimately could result in a loss of sales. Any of these events could create liability for us and damage our reputation, which could have a material adverse effect on our revenue, business, results of operations and financial condition and the market price of our shares.

If our security measures are breached or unauthorized access to customer data is otherwise obtained, our solutions may be perceived as not being secure, customers may reduce the use of or stop using our solutions and we may incur significant liabilities.

The evolution of technology systems introduces ever more complex security risks that are difficult to predict and defend against. An increasing number of companies, including those with significant online operations, have recently disclosed breaches of their security, some of which involved sophisticated tactics and techniques allegedly attributable to criminal enterprises or nation-state actors. While we believe that we have taken appropriate measures to prevent unintended access to the data we hold (including implementing security and privacy controls, training our workforce and implementing new technology) and we continue to improve and enhance our systems in this regard, our efforts may not always be successful.

In addition, we do not know whether our current practices will be deemed sufficient under applicable laws or whether new regulatory requirements might make our current practices insufficient.

Our solutions involve the collection, analysis and retention of our customers' proprietary information related to their drug development efforts, including clinical data. Unauthorized access to this information or data, whether by third-party action or employee error, and whether deliberate or unintentional, could result in the loss of information, litigation, indemnity obligations, damage to our reputation and other liability. Our increased reliance on remote access to our information systems due to the COVID 19 pandemic has increased our exposure to potential cybersecurity breaches and the risk of loss or exposure of such information and data. Additionally, we rely on third-parties and their security procedures for the secure storage, processing, maintenance, and transmission of information that is critical to our operations and such third-parties may also suffer cybersecurity incidents. Depending on their nature and scope, this could potentially result in the misappropriation, destruction, corruption or unavailability of critical data and confidential or proprietary information (our own or that of third parties, including information about our customers and employees) and the disruption of business operations.

If there is a cybersecurity incident and we know or suspect that certain personal information has been accessed, or used inappropriately, we may need to inform the affected individuals and may be subject to significant fines and penalties. Further, under certain regulatory schemes, such as the CCPA, individuals may bring private claims and we may be liable for statutory damages. Further, if the technical and operational solutions we have adopted to maintain data security fail, our existing and potential customers may lose confidence in our ability to maintain the confidentiality of their intellectual property, we may be subject to breach of contract claims by our customers and we may suffer reputational and other harm as a result. Our insurance may not be adequate to cover losses associated with such events, and in any case, such insurance may not cover all of the types of costs, expenses and losses we could incur to respond to and remediate a security breach. Defending against investigations, claims or litigation based on any security breach or incident, regardless of their merit, will be costly and may cause reputation harm. The successful assertion of one or more large claims against us that exceed available insurance coverage, denial of coverage as to any specific claim, or any change or cessation in our insurance policies and coverages, including premium increases or the imposition of large deductible requirements, could have a material adverse effect on our reputation, business, financial condition and results of operations.

We are subject to numerous privacy and data security laws and related contractual requirements and our failure to comply with those obligations could cause us significant harm.

In the normal course of our business, we collect, process, use and disclose information about individuals, including protected health information and other patient data, as well as information relating to health professionals and our employees. The collection, processing, use, disclosure, disposal and protection of such information is highly regulated both in the U. S. and other jurisdictions, including but not limited to, under HIPAA, as amended by HITECH; United States state privacy, security and breach notification and healthcare information laws; the European Union's GDPR; and other European privacy laws as well as privacy laws being adopted in other regions around the world. These laws and regulations are complex and their interpretation is rapidly evolving, making implementation and enforcement, and thus compliance requirements, ambiguous, uncertain and potentially inconsistent. In addition, our collection, processing, use, disclosure, and protection of information is subject to related contractual requirements. Compliance with such laws and related contractual requirements may require changes to our collection, use, transfer, disclosure, or other processing of information about individuals, and may thereby increase compliance costs. Failure to comply with such laws and/or related contractual obligations could result in regulatory enforcement or claims against us for breach of contract, or may lead third parties to terminate their contracts with us and/or choose not to work with us in the future. Should this occur, there could be a material adverse effect on our reputation, business, financial condition, and results of operations.

These regulations often govern the use, handling and disclosure of information about individuals, including medical information and require the use of standard contracts, privacy and security standards and other administrative simplification provisions. In relation to HIPAA, we do not consider our service offerings to generally cause us to be subject

as a covered entity; however, in certain circumstances, we are subject to HIPAA as a business associate and may enter into business associate agreements.

Additionally, the Federal Trade Commission (the "FTC") and many state attorneys general are interpreting existing federal and state consumer protection laws to impose evolving standards for the online collection, use, dissemination and security of information about individuals, including health-related information. Courts may also adopt the standards for fair information practices promulgated by the FTC, which concern consumer notice, choice, security and access. Consumer protection laws require us to publish statements that describe how we handle information about individuals and choices individuals may have about the way we handle their information. If such information that we publish is considered untrue, we may be subject to government claims of unfair or deceptive trade practices, which could lead to significant liabilities and consequences. Furthermore, according to the FTC violating consumers' privacy rights or failing to take appropriate steps to keep information about consumers secure may constitute unfair acts or practices in or affecting commerce in violation of Section 5(a) of the FTC Act.

In addition, certain states have adopted robust privacy and security laws and regulations. Such laws and regulations will be subject to interpretation by various courts and other governmental authorities, thus creating potentially complex compliance issues for us and our future customers and strategic partners. For example, the CCPA, which took effect in 2020, imposes obligations and restrictions on businesses regarding their collection, use, and sharing of personal information and provides new and enhanced data privacy rights to California residents, such as affording them the right to access and delete their personal information and to opt out of certain sharing of personal information. Protected health information that is subject to HIPAA is excluded from the CCPA, however, information we hold about individuals which is not subject to HIPAA would be subject to the CCPA. It is unclear how HIPAA and the other exceptions may be applied under the CCPA. The CCPA may increase our compliance costs and potential liability. Many similar privacy laws have been proposed at the federal level and in other states.

The GDPR became enforceable on May 25, 2018. The GDPR regulates our processing of personal data, and imposes stringent requirements. The GDPR includes sanctions for violations up to the greater of €20 million or 4.0% of worldwide gross annual revenue and applies to services providers such as us. In addition, following the transitional period following Brexit, we must comply with the GDPR and also the UK GDPR, with each regime having the ability to fine up to the greater of €20 million (£17 million) or 4% of global turnover. The relationship between the United Kingdom and the European Union in relation to certain aspects of data protection law remains unclear, for example how data transfers between EU member states and the United Kingdom are treated and the role of the Information Commissioner's Office following the end of the transitional period. These changes will lead to additional costs and increase our overall risk exposure.

Recent legal developments in Europe have created complexity and uncertainty regarding transfers of personal data from the EEA to the United States, e.g. on July 16, 2020, the Court of Justice of the European Union ("CJEU") invalidated the EU-US Privacy Shield Framework ("Privacy Shield") under which personal data could be transferred from the EEA to U.S. entities who had self-certified under the Privacy Shield scheme. While the CJEU upheld the adequacy of the standard contractual clauses (a standard form of contract approved by the European Commission as an adequate personal data transfer mechanism, and potential alternative to the Privacy Shield), it made clear that reliance on them alone may not necessarily be sufficient in all circumstances; this has created uncertainty. In June 2021, the European Commission published revised standard contractual clauses, and shortly thereafter the European Data Protection Board promulgated guidance on implementation of the new clauses. Even with the additional clarity provided by these developments, the validity of the standard contractual clauses as a transfer mechanism remains uncertain. The concerns raised by the CJEU relating to the perceived risks of transferring personal data to the United States, and the ability of the standard contractual clauses to address those risks, persist under the new standard contractual clauses framework. We have previously relied on our own Privacy Shield certification and our relevant customers' and third parties' Privacy Shield certification(s) for the purposes of transferring personal data from the EEA to the United States in compliance with the GDPR's data export conditions. We also currently rely on the standard contractual clauses to transfer personal data outside the EEA, including to the United States. If all or some jurisdictions within the European Union or the United Kingdom determine that the new standard contractual clauses also cannot be used to transfer personal data to the United States, we could be left with no reasonable option for the lawful cross-border transfer of personal data. If left with no reasonable option for the lawful cross-border transfer of personal data, and if we nonetheless continue to transfer personal data from the European Union

to the United States, that could lead to governmental enforcement actions, litigation, fines and penalties or adverse publicity, which could have an adverse effect on our reputation and business or cause us to need to establish systems to maintain certain data in the European Union, which may involve substantial expense and cause us to divert resources from other aspects of our operations, all of which may adversely affect our business.

We believe we maintain adequate processes and systems to ensure our and our customers' compliance with the requirements of the GDPR, but it is possible that we could fail to comply or that we could incur liability due to the acts or omissions of our customers. Further, these recent developments will require us to review and amend the legal mechanisms by which we make and/or receive personal data transfers to/ in the United States. In the event we are not able to secure indemnification or the indemnification and any insurance coverage is inadequate to cover our losses, we could suffer significant financial, operational, reputational and other harm and our business, results of operations, financial condition and/or cash flows could be materially adversely affected. Furthermore, as supervisory authorities issue further guidance on personal data export mechanisms, including circumstances where the standard contractual clauses cannot be used, and/or start taking enforcement action, we could suffer additional costs, complaints and/or regulatory investigations or fines, and/or if we are otherwise unable to transfer personal data between and among countries and regions in which we operate, it could affect the manner in which we provide our services, the geographical location or segregation of our relevant systems and operations, and could adversely affect our financial results.

The United States, the European Union, and other jurisdictions where we operate continue to issue new, and enhance existing, privacy and data security protection regulations related to the collection, use, disclosure, disposal and protection of information about individuals, including medical information. Privacy and data security laws are rapidly evolving both in the United States and internationally, and the future interpretation of those laws is somewhat uncertain. For example, we do not know how E.U. regulators will interpret or enforce many aspects of the GDPR and some regulators may do so in an inconsistent manner. In the United States, privacy and data security is an area of emphasis for some but not all state regulators, and new legislation has been and likely will continue to be introduced at the state and/or federal level. Additional legislation or regulation might, among other things, require us to implement new security measures and processes or bring within the legislation or regulation de-identified health or other information about individuals, each of which may require substantial expenditures or limit our ability to offer some of our services.

We may be unable to adequately enforce or defend our ownership and use of our intellectual property and other proprietary rights.

Our success is dependent upon our intellectual property and other proprietary rights. We rely upon a combination of trademark, trade secret, copyright, patent and unfair competition laws, as well as contractual provisions, to protect our intellectual property and other proprietary rights. In addition, we attempt to protect our intellectual property and proprietary information by enforcing cyber and physical security measures and requiring our employees and certain of our consultants to enter into confidentiality, non-competition and assignment-of-inventions agreements. The steps we take to protect these rights may not be adequate to prevent misappropriation of our technology by third parties or may not be adequate under the laws of some foreign countries, which may not protect our intellectual property rights to the same extent as do the laws of the United States. Our attempts to protect our intellectual property may be challenged by others or invalidated through administrative process or litigation, and agreement terms that address non-competition are difficult to enforce in many jurisdictions and may not be enforceable in any particular case. In addition, there remains the possibility that others will "reverse engineer" our software products in order to introduce competing products, or that others will develop competing technology independently. If we resort to legal proceedings to enforce our intellectual property rights or to determine the validity and scope of the intellectual property or other proprietary rights of others, the proceedings could be burdensome and expensive, even if we were to prevail. The failure to adequately protect our intellectual property and other proprietary rights may have a material adverse effect on our business, results of operations or financial condition.

Third parties may initiate legal proceedings alleging that we are infringing, misappropriating or otherwise violating their intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business.

Our commercial success depends upon our ability to develop, market and sell our products and services, allowing our customers to use our proprietary technologies without infringing, misappropriating or otherwise violating the intellectual

property and proprietary rights of third parties. There is considerable patent and other intellectual property litigation in the software, pharmaceutical and biotechnology industries. We may become party to, or be threatened with, adversarial proceedings or litigation regarding intellectual property rights with respect to our technology and product candidates.

The legal threshold for initiating litigation or contested proceedings is low, so that even lawsuits or proceedings with a low probability of success might be initiated and require significant resources to defend. Litigation and contested proceedings can also be expensive and time-consuming, and our adversaries in these proceedings may have the ability to dedicate substantially greater resources to prosecuting these legal actions than we can. The risks of being involved in such litigation and proceedings may increase with the greater visibility associated with being a public company. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future, regardless of merit. We may not be aware of all such intellectual property rights potentially relating to our technology, or we may incorrectly conclude that third-party intellectual property is invalid or that our activities do not infringe such intellectual property. Thus, we do not know with certainty that our technology does not and will not infringe, misappropriate or otherwise violate any third party's intellectual property.

Parties making claims against us may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize the product candidates that we may identify. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful claim of infringement against us, we may have to pay substantial damages (including treble damages and attorneys' fees for willful infringement), pay royalties, redesign our infringing products, be forced to indemnify our customers or collaborators or obtain one or more licenses from third parties, which may be impossible or require substantial time and monetary expenditure.

We may choose to take a license or, if we are found to infringe, misappropriate or otherwise violate a third party's intellectual property rights, we could also be required to obtain a license from such third party to continue developing and marketing our technology. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors and other third parties access to the same technologies licensed to us and could require us to make substantial licensing and royalty payments. We could be forced, including by court order, to cease developing and commercializing the infringing technology or product. A finding of infringement could prevent us from commercializing any product candidates or force us to cease some of our business operations, which could materially harm our business. In addition, we may be forced to redesign a product. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar material adverse effect on our reputation, business, financial condition and results of operations.

If we fail to comply with certain healthcare laws, including fraud and abuse laws, we could face substantial penalties and our business, results of operations, financial condition and prospects could be adversely affected.

Even though we do not order healthcare services or bill directly to Medicare, Medicaid or other third party payors, as a result of contractual, statutory or regulatory requirements, we may be subject to healthcare fraud and abuse laws of both the federal government and the states in which we conduct our business. Because of the breadth of these laws and the narrowness of available statutory and regulatory exceptions, it is possible that some of our business activities could be subject to challenge under one or more of such laws. If we or 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 penalties, including civil and criminal penalties, damages, fines, imprisonment and the curtailment or restructuring of our operations, any of which could materially adversely affect our ability to operate our business and our financial results.

Risks Related to Our Indebtedness

Our indebtedness could materially adversely affect our financial condition and our ability to operate our business, react to changes in the economy or industry or pay our debts and meet our obligations under our debt and could divert our cash flow from operations to debt payments.

As of December 31, 2021, we had $300.5 million in total borrowings under our credit agreement, originally dated July 15, 2017 ("Credit Agreement") and third modification on June 17, 2021. As of December 31, 2021, we had a $100.0 million

revolving credit facility under our Credit Agreement under which we had $99.8 million of availability after giving effect to outstanding letters of credit. In addition, subject to restrictions governing our Credit Agreement, we may incur additional debt.

Our debt could have important consequences to you, including the following:

- it may be difficult for us to satisfy our obligations, including debt service requirements under our outstanding debt, resulting in possible defaults on and acceleration of such indebtedness;
- our ability to obtain additional financing for working capital, capital expenditures, debt service requirements or other general corporate purposes may be impaired;
- a portion of cash flow from operations may be dedicated to the payment of principal and interest on our debt, therefore reducing our ability to use our cash flow to fund our operations, capital expenditures, future business opportunities, acquisitions and other purposes;
- we may be more vulnerable to economic downturns and adverse industry conditions and our flexibility to plan for, or react to, changes in our business or industry may be more limited;
- our ability to capitalize on business opportunities and to react to competitive pressures, as compared to our competitors, may be compromised due to our level of debt; and
- our ability to borrow additional funds or to refinance debt may be limited.

Furthermore, all of our debt under our Credit Agreement bears interest at variable rates. If these rates were to increase significantly, whether because of an increase in market interest rates or a decrease in our creditworthiness, our ability to borrow additional funds may be reduced and the risks related to our debt would intensify.

Servicing our debt requires a significant amount of cash. For the years ended December 31, 2021 and 2020, we used operating cash of $17.9 million and $48.7 million, respectively, to service our debt. Our ability to generate sufficient cash depends on numerous factors beyond our control, and we may be unable to generate sufficient cash flow to service our debt obligations.

Our business may not generate sufficient cash flow from operating activities to service our debt obligations. Our ability to make payments on and to refinance our debt and to fund planned capital expenditures depends on our ability to generate cash in the future. To some extent, this is subject to general economic, financial, competitive, legislative, regulatory and other factors that are beyond our control.

If we are unable to generate sufficient cash flow from operations to service our debt and meet our other commitments, we may need to refinance all or a portion of our debt, sell material assets or operations, delay capital expenditures or raise additional debt or equity capital. We may not be able to effect any of these actions on a timely basis, on commercially reasonable terms or at all, and these actions may not be sufficient to meet our capital requirements. In addition, the terms of our existing or future debt agreements may restrict us from pursuing any of these alternatives.

Restrictive covenants governing our Credit Agreement may restrict our ability to pursue our business strategies, and failure to comply with any of these restrictions could result in acceleration of our debt.

The operating and financial restrictions and covenants governing our Credit Agreement may materially adversely affect our ability to finance future operations or capital needs or to engage in other business activities. Such agreements limit our ability, among other things, to:

- incur additional indebtedness and guarantee indebtedness;

- pay dividends on or make distributions in respect of our common stock or make other restricted payments;
- make certain acquisitions, investments, loans and advances;
- transfer or sell certain assets;
- create liens on certain assets;
- consolidate, merge, sell or otherwise dispose of all or substantially all of our assets;
- make certain payments in respect of certain junior debt obligations;
- create negative pledges;
- enter into certain transactions with our affiliates; and
- designate our subsidiaries as unrestricted subsidiaries.

In addition, the restrictive covenants in our Credit Agreement require us to maintain a specified first lien leverage ratio when a certain percentage of our revolving credit facility commitments are borrowed and outstanding as of the end of each fiscal quarter. In certain circumstances, our ability to meet this financial covenant may be affected by events beyond our control.

A breach of any of these covenants could result in a default under our Credit Agreement. Upon the occurrence of an event of default under our Credit Agreement, the lenders could elect to declare all amounts outstanding under our Credit Agreement to be immediately due and payable and terminate any commitments to extend further credit. If we were unable to repay those amounts, the lenders under our Credit Agreement could proceed against the collateral granted to them to secure that indebtedness. We have pledged substantially all of our assets as collateral to secure our Credit Agreement. In the event of an acceleration of our debt upon a default, we may not have or be able to obtain sufficient funds to make any accelerated payments.

Furthermore, the terms of any future indebtedness we may incur could have further additional restrictive covenants. We may not be able to maintain compliance with these covenants in the future, and in the event that we are not able to maintain compliance, we cannot assure you that we will be able to obtain waivers from the lenders or amend the covenants.

We and our subsidiaries may still be able to incur substantially more debt. This could further exacerbate the risks associated with our leverage.

We and our subsidiaries may be able to incur substantial additional debt in the future. Although the agreements governing our Credit Agreement contain restrictions on the incurrence of additional debt, these restrictions are subject to a number of qualifications and exceptions, and the debt incurred in compliance with these restrictions could be substantial. Additionally, we may successfully obtain waivers of these restrictions. If we incur additional debt above the levels currently in effect, the risks associated with our leverage, including those described above, would increase. Our Credit Agreement includes a revolving credit facility in an aggregate principal amount of $100.0 million, with a sub-commitment for issuance of letters of credit. Under the revolving credit facility we had $99.8 million of availability as of December 31, 2021, after giving effect to outstanding letters of credit.

Risks Related to our Financial Statements and Results

Impairment of goodwill or other intangible assets may adversely impact future results of operations.

We have intangible assets, including goodwill and other finite-lived and indefinite-lived intangibles, on our balance sheet due to our acquisitions of businesses. The initial identification and valuation of these intangible assets and the

determination of the estimated useful lives at the time of acquisition involve use of management judgments and estimates. These estimates are based on, among other factors, input from accredited valuation consultants, reviews of projected future income cash flows and statutory regulations. The use of alternative estimates and assumptions might have increased or decreased the estimated fair value of our goodwill and other intangible assets that could potentially result in a different impact to our results of operations. If the future growth and operating results of our business are not as strong as anticipated and/or our market capitalization declines, this could impact the assumptions used in calculating the fair value of goodwill or other indefinite-lived intangibles. To the extent goodwill or other indefinite-lived intangibles are impaired, their carrying value will be written down to its implied fair value and a charge will be made to our income from continuing operations. Such an impairment charge could materially and adversely affect our operating results. As of December 31, 2021, and 2020, the carrying amount of goodwill and other intangibles was $1.2 billion and $915.0 million, respectively, on our consolidated balance sheets.

Our ability to use our NOLs and R&D tax credit carryforwards to offset future taxable income may be subject to certain limitations.

As of December 31, 2021, we had federal and state NOLs of approximately $2.4 million and $2.6 million, respectively, which are available to reduce future taxable income and expire between 2024 and 2040 and 2029 and 2039, respectively. We had federal R&D tax credit carryforwards of approximately $1.5 million, which expire between 2025 and 2041, and state R&D tax credit carryforwards of approximately $0.4 million with indefinite carryover period, which are available to offset future income taxes. We also had foreign tax credits of approximately $15.1 million, which will start to expire in 2025. These carryforwards that may be utilized in a future period may be subject to limitations based upon changes in the ownership of our stock in a future period. Additionally, we carried forward foreign NOLs of approximately $24.5 million which will start to expire in 2022, foreign research and development credits of $0.4 million which will start to expire in 2029, and Canadian investment tax credits of approximately $3.8 million which will expire if unused in years 2030 through 2039. Our carryforwards are subject to review and possible adjustment by the appropriate taxing authorities.

In addition, in general, under Section 382 of the Internal Revenue Code of 1986, as amended (the “Code”), and corresponding provisions of state law, a corporation that undergoes an “ownership change,” generally defined as a greater than 50 percentage point change (by value) in its equity ownership by certain stockholders over a three year period, is subject to limitations on its ability to utilize its pre-change NOLs, R&D tax credit carryforwards and disallowed interest expense carryforwards to offset future taxable income. We have performed an analysis for the period January 1, 2021 through December 31, 2021 and determined that an ownership change did not occur during this period. We may experience further ownership changes in the future and/or subsequent changes in our stock ownership (which may be outside our control). As a result, if, and to the extent that, we earn net taxable income, our ability to use our pre-change NOLs, R&D tax credit carryforwards and disallowed interest expense carryforwards to offset such taxable income may be subject to limitations.

If our estimates or judgments relating to our critical accounting policies prove to be incorrect or financial reporting standards or interpretations change, our results of operations could be adversely affected.

The preparation of financial statements in conformity with U. S. generally accepted accounting principles (“GAAP”) requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. We base our estimates on historical experience, known trends and events, and various other factors that we believe to be reasonable under the circumstances, as provided in “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Critical Accounting Policies and Significant Judgments and Estimates.” The results of these estimates form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Significant assumptions and estimates used in preparing our consolidated financial statements include the estimated variable consideration included in the transaction price in our contracts with customers and equity-based compensation. Our results of operations may be adversely affected if our assumptions change or if actual circumstances differ from those in our assumptions, which could cause our results of operations to fall below the expectations of securities analysts and investors, resulting in a decline in the trading price of our common stock.

Additionally, we regularly monitor our compliance with applicable financial reporting standards and review new pronouncements and drafts thereof that are relevant to us. As a result of new standards, changes to existing standards and changes in their interpretation, we might be required to change our accounting policies, alter our operational policies, and implement new or enhance existing systems so that they reflect new or amended financial reporting standards, or we may be required to restate our published financial statements. Such changes to existing standards or changes in their interpretation may have an adverse effect on our reputation, business, financial position, and profit.

Risks Related to Ownership of Our Common Stock

We are a holding company with no operations and rely on our operating subsidiaries to provide us with funds necessary to meet our financial obligations.

We are a holding company with no material direct operations. Our principal assets are the shares of common stock of Certara Holdco, Inc. ("Certara Holdco") that we hold indirectly through our subsidiaries. Certara Holdco, together with its subsidiaries, owns substantially all of our operating assets. As a result, we are dependent on loans, dividends and other payments from our subsidiaries to generate the funds necessary to meet our financial obligations. Our subsidiaries are legally distinct from us and may be prohibited or restricted from paying dividends or otherwise making funds available to us, including restrictions under the covenants of the agreements governing our Credit Agreement. If we are unable to obtain funds from our subsidiaries, we may be unable to meet our financial obligations.

Future sales, or the perception of future sales, by us or our existing stockholders in the public market could cause the market price for our common stock to decline.

The sale of additional shares of our common stock in the public market, or the perception that such sales could occur, could harm the prevailing market price of shares of our common stock. These sales, or the possibility that these sales may occur, also might make it more difficult for us to sell equity securities in the future at a time and at a price that we deem appropriate.

As of December 31, 2021, shares held by EQT and our officers and directors in aggregate represented approximately 27.5% of our outstanding common stock. The market price of our shares of common stock could drop significantly if the holders of these shares sell them or are perceived by the market as intending to sell them. These factors could also make it more difficult for us to raise additional funds through future offerings of our shares of common stock or other securities.

In addition, the shares of our common stock reserved for future issuance under the 2020 Incentive Plan ("Plan Share Reserve") or our 2020 Employee Stock Purchase Plan will become eligible for sale in the public market once those shares are issued, subject to provisions relating to various vesting agreements, lock-up agreements and Rule 144, as applicable. A total of 19,898,104 and 1,700,000 shares of common stock have been reserved for future issuance under the 2020 Incentive Plan and our 2020 Employee Stock Purchase Plan, respectively as of December 31, 2021. Pursuant to the terms of the 2020 Incentive Plan, the Plan Share Reserve automatically increases on the first day of each fiscal year by a number of shares of common stock equal to the lesser of (i) the positive difference, if any, between (A) 4% of the Company's outstanding common stock on the last day of the immediately preceding fiscal year, and (B) the Plan Share Reserve on the last day of the immediately preceding fiscal year, and (ii) the number of shares of common stock as may be determined by the Board.

In the future, we may also issue our securities in connection with investments or acquisitions. For example, we issued 2,239,717 shares of common stock in connection with our acquisition of Pinnacle in October 2021. The amount of shares of our common stock issued in connection with an investment or acquisition could constitute a material portion of our then-outstanding shares of our common stock. Any issuance of additional securities in connection with investments or acquisitions may result in additional dilution.

Provisions in our organizational documents could delay or prevent a change of control.

Certain provisions of our amended and restated certificate of incorporation, amended and restated bylaws and stockholders agreement may have the effect of delaying or preventing a merger, acquisition, tender offer, takeover attempt or other

change of control transaction that a stockholder might consider to be in its best interest, including attempts that might result in a premium over the market price of our common stock.

These provisions provide, among other things:

- for the division of our board of directors into three classes, as nearly equal in size as possible, with directors in each class serving three-year terms and with terms of the directors of only one class expiring in any given year;
- that directors may only be removed for cause, and only by the affirmative vote of the holders of at least two-thirds in voting power of all the then-outstanding shares of stock entitled to vote thereon, voting together as a single class;
- for the ability of our board of directors to issue one or more series of preferred stock with voting or other rights or preferences that could have the effect of impeding the success of an attempt to acquire us or otherwise effect a change of control;
- for advance notice for nominations of directors by stockholders and for stockholders to include matters to be considered at stockholder meetings;
- that special stockholder meetings may be called only by or at the direction of our board of directors or the chairman of our board of directors; and
- that certain provisions of our amended and restated certificate of incorporation and amended and restated bylaws pertaining to amendments, our board of directors, limitation of director liability, stockholder consents, annual and special stockholder meetings, competition and corporate opportunities and business combinations, may be amended only by the affirmative vote of the holders of at least two-thirds in voting power of all the then-outstanding shares of our stock entitled to vote thereon, voting together as a single class, which limitation may have the effect of deferring, delaying or discouraging hostile takeovers, or changes in control or management of our Company.

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

EQT holds a substantial amount of our outstanding common stock, and its interests may be different than the interests of other holders of our common stock.

As of December 31, 2021, EQT owned approximately 23.5% of our outstanding common stock. Under the terms of our stockholders agreement, EQT and certain of its affiliates have the right to nominate to our board of directors a number of nominees equal to (x) the total number of directors comprising our board of directors at such time, multiplied by (y) the percentage of our outstanding common stock held from time to time by EQT and such affiliates (with any fractional amounts are rounded up to the nearest whole number). As a result, EQT retains relatively significant influence over actions to be taken by us.

EQT is in the business of making investments in companies and may from time to time acquire and hold interests in businesses that compete directly or indirectly with us. Our amended and restated certificate of incorporation provides that none of EQT, any of their respective affiliates or any director who is not employed by us (including any non-employee director who serves as one of our officers in both his director and officer capacities) or his or her affiliates will have any duty to refrain from engaging, directly or indirectly, in the same business activities or similar business activities or lines of business in which we operate. EQT also may pursue acquisition opportunities that may be complementary to our business, and, as a result, those acquisition opportunities may not be available to us.

So long as EQT continues to own a significant amount of our outstanding common stock, even though such amount is less than 50%, they will be able to influence our decisions and, so long as EQT continues to own shares of our outstanding common stock, EQT will have the ability to nominate individuals to our board of directors. In addition, EQT will have significant influence over the outcome of all matters requiring stockholder approval, including any potential change of control of our company. The concentration of ownership could deprive investors of an opportunity to receive a premium for shares of common stock as part of a sale of our Company and ultimately might affect the market price of our common stock.

Our amended and restated certificate of incorporation provides, subject to limited exceptions, that the Court of Chancery of the State of Delaware and, to the extent enforceable, the federal district courts of the United States of America will be the sole and exclusive forums for certain stockholder litigation matters, which could limit our stockholder's ability to obtain a favorable judicial forum for disputes with us or our current and former directors, officers, employees or stockholders.

Our amended and restated certificate of incorporation provides, subject to limited exceptions, that unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall, to the fullest extent permitted by law, be the sole and exclusive forum for any (i) derivative action or proceeding brought on behalf of our company, (ii) action asserting a claim of breach of a fiduciary duty owed by any current or former director, officer, employee or stockholder of our company to the Company or our stockholders, (iii) action asserting a claim against the Company or any current or former director, officer, employee or stockholder of the Company arising pursuant to any provision of the Delaware General Corporation Law ("DGCL"), or our amended and restated certificate of incorporation or our amended and restated bylaws (as either might be amended from time to time) or (iv) action asserting a claim governed by the internal affairs doctrine of the State of Delaware. Unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States of America shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the federal securities laws of the United States of America. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and consented to the forum provisions in our amended and restated certificate of incorporation. Although our amended and restated certificate of incorporation contains the exclusive forum provision described above, it is possible that a court could find that such a provision is inapplicable for a particular claim or action or that such provision is unenforceable.

These choice of forum provisions may limit a stockholder's ability to bring a claim in a different judicial forum, including one that it may find favorable or convenient for disputes with us or any of our directors, officers or other employees which may discourage lawsuits with respect to such claims. Alternatively, if a court were to find the choice of forum provisions that will be contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable with respect to one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business, operating results and financial condition.

Our board of directors are authorized to issue and designate shares of our preferred stock in additional series without stockholder approval.

Our amended and restated certificate of incorporation authorizes our board of directors, without the approval of our stockholders, to issue 50,000,000 shares of our preferred stock, subject to limitations prescribed by applicable law, rules and regulations and the provisions of our amended and restated certificate of incorporation, as shares of preferred stock in series, to establish from time to time the number of shares to be included in each such series and to fix the designation, powers, preferences and rights of the shares of each such series and the qualifications, limitations or restrictions thereof. The powers, preferences and rights of these additional series of preferred stock may be senior to or on parity with our common stock, which may reduce its value.

General Risk Factors

Our stock price may change significantly, and you may not be able to resell shares of our common stock at or above the price you paid or at all, and you could lose all or part of your investment as a result.

The trading price of our common stock is likely to be volatile. The stock market has experienced extreme volatility. This volatility often has been unrelated or disproportionate to the operating performance of particular companies. You may not be able to resell your shares at or above the initial price you paid due to a number of factors such as those listed in other portions of this "Risk Factors" section and the following:

- results of operations that vary from the expectations of securities analysts and investors;
- results of operations that vary from those of our competitors;
- changes in expectations as to our future financial performance, including financial estimates and investment recommendations by securities analysts and investors;
- declines in the market prices of stocks generally;
- strategic actions by us or our competitors;
- announcements by us or our competitors of significant contracts, new products, acquisitions, joint marketing relationships, joint ventures, other strategic relationships or capital commitments;
- changes in general economic or market conditions or trends in our industry or markets;
- changes in business or regulatory conditions;
- additions or departures of key management personnel;
- future sales of our common stock or other securities by us or our existing stockholders, or the perception of such future sales;
- investor perceptions of the investment opportunity associated with our common stock relative to other investment alternatives;
- the public's response to press releases or other public announcements by us or third parties, including our filings with the SEC;
- announcements relating to litigation;
- guidance, if any, that we provide to the public, any changes in this guidance or our failure to meet this guidance;
- the development and sustainability of an active trading market for our stock;
- changes in accounting principles; and
- other events or factors, including those resulting from natural disasters, war, acts of terrorism or responses to these events.

These broad market and industry fluctuations may materially adversely affect the market price of our common stock, regardless of our actual operating performance. In addition, price volatility may be greater if the public float and trading volume of our common stock are low.

In the past, following periods of market volatility, stockholders have instituted securities class action litigation. If we were involved in securities litigation, it could have a substantial cost and divert resources and the attention of executive management from our business regardless of the outcome of such litigation.

Our quarterly operating results fluctuate and may fall short of prior periods, our projections or the expectations of securities analysts or investors, which could materially adversely affect our stock price.

Our operating results have fluctuated from quarter to quarter at points in the past, and they may do so in the future. Therefore, results of any one fiscal quarter are not a reliable indication of results to be expected for any other fiscal quarter or for any year. If we fail to increase our results over prior periods, to achieve our projected results or to meet the expectations of securities analysts or investors, our stock price may decline, and the decrease in the stock price may be disproportionate to the shortfall in our financial performance. Results may be affected by various factors, including those described in these risk factors.

If securities analysts do not publish research or reports about our business or if they downgrade our stock or our sector, our stock price and trading volume could decline.

The trading market for our common stock will rely in part on the research and reports that industry or financial analysts publish about us or our business or industry. We do not control these analysts. Furthermore, if one or more of the analysts who do cover us were to downgrade our stock or our industry, or the stock of any of our competitors, or publish inaccurate or unfavorable research about our business or industry, the price of our stock could decline. If one or more of these analysts ceases coverage of us or fails to publish reports on us regularly, we could lose visibility in the market, which in turn could cause our stock price or trading volume to decline.

Failure to comply with requirements to design, implement and maintain effective internal controls could have a material adverse effect on our business and stock price.

As a public company, we have significant requirements for enhanced financial reporting and internal controls. The process of designing and implementing effective internal controls is a continuous effort that requires us to anticipate and react to changes in our business and the economic and regulatory environments and to expend significant resources to maintain a system of internal controls that is adequate to satisfy our reporting obligations as a public company. If we are unable to establish or maintain appropriate internal financial reporting controls and procedures, it could cause us to fail to meet our reporting obligations on a timely basis, result in material misstatements in our consolidated financial statements and harm our results of operations. In addition, we are required, pursuant to Section 404, to furnish a report by management on, among other things, the effectiveness of our internal control over financial reporting in our annual report.

Our management conducted an evaluation, under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our internal control over financial reporting based on the framework in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, our management concluded that our internal control over financial reporting was not effective at December 31, 2021, because of the material weakness described below. A “material weakness” is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is more than a reasonable possibility that a material misstatement of the Company's annual or interim financial statements will not be prevented or detected on a timely basis. We concluded that we did not have an effective information technology general controls over one of the information technology system that supports the project set-up and time submissions for services provided. We believe these control deficiencies were a result of IT processes lacking adequate reviews and documentation to maintain effective controls related to access management, change management and review over third party service organization report. The material weakness did not result in any identified misstatements and there were no changes to previously released financial result. We are taking steps to remediate the material weakness.

In connection with the implementation of the necessary procedures and practices related to internal control over financial reporting, we may in the future identify other deficiencies that we may not be able to remediate in time to meet the deadline imposed by the SOX for compliance with the requirements of Section 404. In addition, we may encounter problems or delays in completing the remediation of any deficiencies identified by our independent registered public accounting firm in connection with the issuance of their attestation report.

We incur substantial costs as a result of operating as a publicly traded company, and our management is required to devote substantial time to compliance initiatives.

As a publicly traded company, and a large accelerated filer, we incur material legal, accounting, and other expenses that we did not previously incur. In addition, the SOX, the Dodd-Frank Wall Street Reform and Consumer Protection Act, and the rules of the SEC, and the stock exchange on which our common shares are listed, have imposed various requirements on public companies. Our management and other personnel need to devote a substantial amount of time to these compliance initiatives as well as investor relations. Moreover, these rules and regulations increase our legal and financial compliance costs and make some activities more time-consuming and costly.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

As of December 31, 2021, we had 41 offices in 15 countries, with our headquarters located in Princeton, New Jersey. We lease or sublease all of our offices. None of our facilities are used for anything other than general office use. We believe that our facilities are suitable and adequate for our operations and we anticipate that additional suitable space will be available when needed. Because of the COVID-19 pandemic, in March 2020, we temporarily closed all of our offices. As of December 31, 2021, the majority of our offices have reopened, subject to a number of safety protocols consistent with local health authority guidance, such as requiring all employees accessing our U.S. offices to be fully vaccinated or limiting the number of employees who may be in a particular office at one time. We regularly reassess the safety protocols and use of specific offices based on the current prevalence of COVID-19 in a particular locale. We believe our employees have been able to maintain the same level of productivity in a remote working environment as they did prior to the pandemic, although we have seen a decrease in employee productivity as a result of the Omicron variant, which we believe will be temporary. We expect that most of our offices will re-open in some capacity once the current pandemic has abated.

As of December 31, 2021, our material operating locations, which we define as the facilities we lease with more than 10,000 square feet, were as follows:

LOCATION	APPROXIMATE SQUARE FOOTAGE	LEASE EXPIRATION DATES
Wilmington, Delaware, USA	18,250	2/28/2027
Princeton, New Jersey, USA	17,560	6/30/2025
Makati, Philippines	16,710	10/31/2022
Sheffield, UK	13,910	1/28/2028
Raleigh, North Carolina, USA	11,560	8/31/2022

Item 3. Legal Proceedings.

From time to time, we may become involved in legal proceedings arising in the ordinary course of our business. Management believes that there is no pending or threatened litigation to which the Company and any of its subsidiaries, or any of the Company or its subsidiaries' properties is the subject of or party to, which, individually or in the aggregate, would have a material adverse effect on our business, results of operations, financial condition and/or cash flows.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information

Our common stock has been listed on The Nasdaq Global Select Market (the "Nasdaq") under the symbol "CERT" since December 11, 2020. Prior to that date, there was no public trading market for our common stock.

As of February 4, 2022, there were 78 holders of record of our common stock as reported by our transfer agent. Holders of record are defined as those stockholders whose shares are registered in their names in our stock records and do not include beneficial owners of common stock whose shares are held in the names of brokers, dealers, and clearing agencies.

Dividend Policy

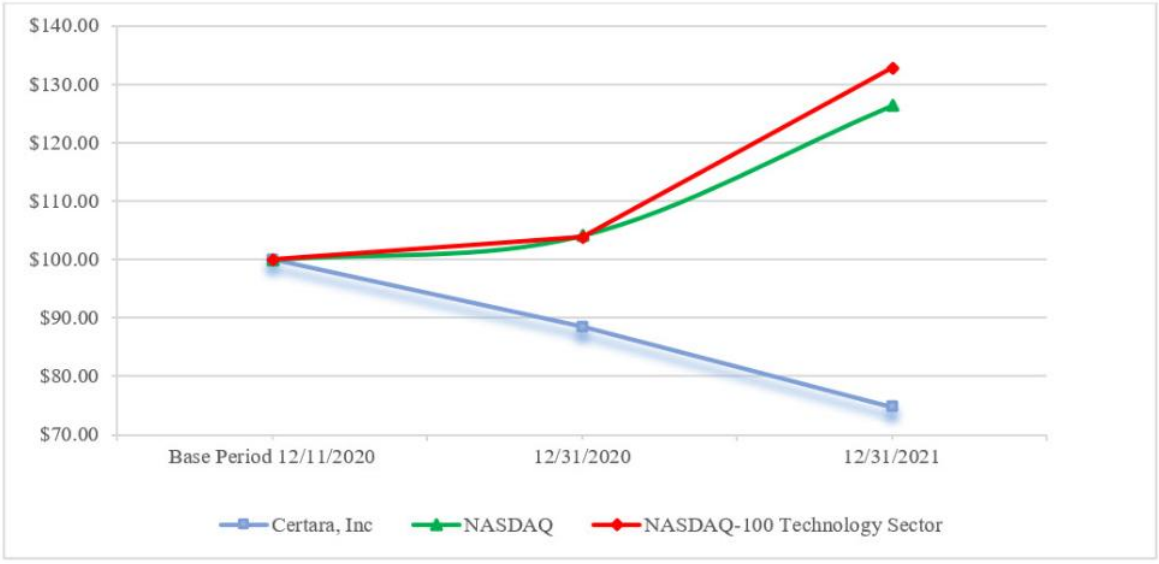
We currently do not expect to declare any dividends on our common stock in the foreseeable future. Instead, we anticipate that all of our earnings in the foreseeable future will be used to provide working capital, to support our operations, to finance the growth and development of our business and to reduce our net debt. Any determination to declare dividends in the future will be at the discretion of our board of directors, subject to applicable laws, and will be dependent on a number of factors, including our earnings, capital requirements and overall financial condition. In addition, because we are a holding company, our ability to pay dividends on our common stock may be limited by restrictions on our ability to obtain sufficient funds through dividends from subsidiaries, including restrictions under our Credit Agreement, and may be further restricted by the terms of any future debt or preferred securities.

Stock Performance Graph

This performance graph shall not be deemed "soliciting material" or to be "filed" with the Securities and Exchange Commission, or the SEC, for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act of 1933, as amended, or the Securities Act.

The following graph compares (i) the cumulative total stockholder return on our common stock from December 11, 2020 (the date our common stock commenced trading on NASDAQ) through December 31, 2021 with (ii) the cumulative total return of the NASDAQ Index and the NASDAQ-100 Technology Sector Index over the same period, assuming the investment of $100 in our common stock and in each index on December 11, 2020 and the reinvestment of dividends. The graph uses the closing market price on December 11, 2020 of $38.08 per share as the initial value of our common stock.

As discussed above, we have never declared or paid a cash dividend on our common stock and do not anticipate declaring or paying a cash dividend in the foreseeable future.



Recent Sales of Unregistered Equity Securities

On October 1, 2021, we issued a total of 2,239,717 shares of restricted common stock, as partial consideration for our acquisition of Pinnacle (the "Pinnacle Issuance"). The Pinnacle Issuance was not registered under the Securities Act of 1933, as amended (the "Securities Act"). Such shares were issued in a private placement exempt from the registration requirements of the Securities Act, in reliance on one or more of the exemptions from the registration requirements of the Securities Act set forth in Section 4(a)(2) of the Securities Act and Regulation D promulgated thereunder.

Issuer Purchases of Equity Securities

None.

Item 6. [Reserved]

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

For purposes of this Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") section, we use the terms "Certara Inc.", "the Company","we", "us", and "our" to refer to Certara, Inc.

You should read the following discussion of our financial condition and results of operations in conjunction with our audited consolidated financial statements and the related notes and other financial information included elsewhere in this Form 10K and our audited consolidated financial statements and notes thereto.

As discussed in the section titled "Special Note Regarding Forward Looking Statements," the following discussion and analysis, in addition to historical financial information, contains forward-looking statements that involve risks and

uncertainties. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of various factors, including those set forth in the section titled "Risk Factors" under Part I, Item 1A above.

We intend the discussion of our financial condition and results of operations that follows to provide information that will assist the reader in understanding our Consolidated Financial Statements, the changes in certain key items in those financial statements from year to year, and the primary factors that accounted for those changes, as well as how certain accounting principles, policies and estimates affect our Consolidated Financial Statements.

Executive Overview

We accelerate medicines to patients using biosimulation software, technolog, and services to transform traditional drug discovery and development. Biosimulation is a powerful technology used to conduct virtual trials using virtual patients to predict how drugs behave in different individuals. Biopharmaceutical companies use our proprietary biosimulation software throughout drug discovery and development to inform critical decisions that not only save significant time and money but also advance drug safety and efficacy, improving millions of lives each year.

As a global leader in biosimulation based on 2021 revenue, we provide an integrated, end-to-end platform used by more than 2,000 clients including biopharmaceutical companies, regulatory agencies and academic institutions across 62 countries, including 38 of the top 40 biopharmaceutical companies by R&D spend in 2020. Since 2014, customers who use our biosimulation software and technology-driven services have received 90% of all new drug approvals by the FDA. Moreover, 17 global regulatory authorities license our biosimulation software to independently analyze, verify, and review regulatory submissions, including the FDA, Health Canada, Japan's PMDA, and China's NMPA. Demand for our offerings continues to expand rapidly.

We build our biosimulation technology on first principles of biology, chemistry, and pharmacology with proprietary mathematical algorithms that model how medicines and diseases behave in the body. For over two decades, we have honed and validated our biosimulation technology with an abundance of data from scientific literature, lab research, and preclinical and clinical studies. In turn, our customers use biosimulation to conduct virtual trials to answer critical questions, such as: What will be the human response to a drug based on preclinical data? How will other drugs interfere with this new drug? What is a safe and efficacious dose for children, the elderly, or patients with pre-existing conditions? Virtual trials may be used to optimize dosing on populations that are otherwise difficult to study for ethical or logistical reasons, such as infants, pregnant women, the elderly, and cancer patients.

Biosimulation results need to be incorporated into regulatory documents for compelling submissions. Accordingly, we provide regulatory science solutions and integrate them with biosimulation so that our customers can navigate the complex and evolving regulatory landscape and maximize their chances of approval. Our differentiated regulatory services are powered by submissions management software and natural language processing for scalability and speed, allowing us to deliver more than 250 regulatory submissions over the past four years. Our team of regulatory professionals has extensive experience applying industry guidelines and global regulatory requirements.

The final hurdle to delivering medicines to patients is market access, defined as strategies, processes, and activities to ensure that therapies are available to patients at the right price. We believe that biosimulation and market access will continue to be increasingly intertwined as health systems and countries move toward outcomes-based pricing. We have recently expanded into technology-driven market access solutions, which help our customers understand the real-world impact of therapies and dosing regimens earlier in the process and effectively communicate this to payors and health authorities. Our solutions are underpinned by technologies such as Bayesian statistical software and SaaS-based value communication tools.

With continued innovation in and adoption of our biosimulation software, technology, and services, we believe more biopharmaceutical companies worldwide will leverage more of our end-to-end platform to reduce cost, accelerate speed to market, and ensure safety and efficacy of medicines for all patients.

Public Offerings

On December 15, 2020, we completed our IPO, pursuant to which we issued and sold 14,630,000 shares of our common stock and certain selling stockholders sold 18,783,250 shares of our common stock (representing the full exercise of the underwriters' option to purchase additional shares), at a public offering price of $23.00 per share. We received net proceeds of $316.3 million, after deducting underwriters' discounts and commissions, but before offering costs. We incurred offering costs of $4.4 million, net of the tax effect of $0.3 million, which we recognized as a charge to additional paid-in capital.

In connection with the closing of our IPO, we repaid in full the $80.0 million outstanding principal amount and $3.0 million accrued interest on our Loan Agreement.

On March 29, 2021, we completed an underwritten secondary public offering in which certain selling stockholders, including EQT, sold 11,500,000 shares of the Company's common stock, including 1,500,000 shares of common stock pursuant to the full exercise of the underwriters' option to purchase additional shares. We did not offer any common stock in this transaction and did not receive any proceeds from the sale of the shares of common stock by the selling stockholders. We incurred costs of $1.1 million, recorded in general and administrative expenses, in relation to the secondary public offering.

On September 13, 2021, we completed another public offering, at a public offering price of $31.00 per share, pursuant to which the Company sold 4,500,000 shares of its common stock, and certain selling stockholders sold 18,500,000 shares of our common stock, including 3,000,000 shares of common stock pursuant to the full exercise of the underwriters' option to purchase additional shares. We received net proceeds of $134.1 million after deducting underwriters' discounts and commissions. In addition, $0.7 million of legal, accounting and other offering costs incurred in connection with the sale of the Company's common stock in the public offering were capitalized and offset against the proceeds received.

On November 22, 2021, we completed another secondary public offering in which certain selling stockholders, including EQT, sold 10,000,000 shares of the Company's common stock. We did not offer any common stock in this transaction and did not receive any proceeds from the sale of the shares of common stock by the selling stockholders. We incurred costs of $0.6 million, recorded in general and administrative expenses, in relation to the secondary public offering.

Key Factors Affecting Our Performance

We believe that the growth of and future success of our business depends on many factors. While each of these factors presents significant opportunities for our business, they also pose important challenges that we must successfully address to sustain our growth and improve results of operations.

Customer Retention and Expansion

Our future operating results depend, in part, on our ability to successfully enter new markets, increase our customer base, and retain and expand our relationships with existing customers. We monitor two key performance indicators to evaluate retention and expansion: new bookings and renewal rates.

- ***Bookings:*** Our new bookings represent a signed contract or purchase order where there is sufficient or reasonable certainty about the customer's ability and intent to fund and commence the software and/or services. Bookings vary from period to period depending on numerous factors, including the overall health of the biopharmaceutical industry, regulatory developments, industry consolidation, and sales performance. Bookings have varied and will continue to vary significantly from quarter to quarter and from year to year. See "Risk Factors — Risks Related to Our Business — Our bookings might not accurately predict our future revenue, and we might not realize all or any part of the anticipated revenue reflected in our backlog."

- ***Renewal Rates:*** Our renewal rates measure the percentage of software customers who renew their licenses or subscriptions at the end of the license or subscription periods. The renewal rate is based on revenues and excludes the effect of price increases or expansions.

The table below summarizes our quarterly bookings and renewal rate trends:

	2019					2020					2021				
	Q1	Q2	Q3	Q4	FULL YEAR	Q1	Q2	Q3	Q4	FULL YEAR	Q1	Q2	Q3	Q4	FULL YEAR
Bookings	66.6	74.7	48.5	69.6	259.5	61.0	70.1	72.9	84.3	288.3	81.9	75.1	72.3	112.4	341.7
Renewal Rate	93 %	89 %(1)	95 %	95 %	93 %	92 %	96 %	84 %	89 %	90 %	92 %	90 %	87 %(2)	96 %	92 %

(1) Due to late renewals by several large biosimulation software customers.

Investments in Growth

We have invested and intend to continue to invest in expanding the breadth and depth of our solutions, including through acquisitions and international expansion. We expect to continue to invest (i) in scientific talent to expand our ability to deliver solutions across the drug development spectrum; (ii) in sales and marketing to promote our solutions to new and existing customers and in existing and expanded geographies; (iii) in research and development to support existing solutions and innovate new technology; and (iv) in other operational and administrative functions to support our expected growth. We expect that our headcount will increase over time and also expect our total operating expenses will continue to increase over time, albeit, at a rate lower than revenue growth.

Our Operating Environment

The acceptance of model-informed biopharmaceutical discovery and development by regulatory authorities affects the demand for our products and services. Support for the use of biosimulation in discovery and development from regulatory bodies, such as the FDA and EMA, has been critical to its rapid adoption by the biopharmaceutical industry. There has been a steady increase in the recognition by regulatory and academic institutions of the role that modeling and simulation can play in the biopharmaceutical development and approval process, as demonstrated by new regulations and guidance documents describing and encouraging the use of modeling and simulation in the biopharmaceutical discovery, development, testing, and approval process, which has directly led to an increase in the demand for our services. Changes in government or regulatory policy, or a reversal in the trend toward increasing the acceptance of and reliance upon *in silico* data in the drug approval process, could decrease the demand for our products and services or lead regulatory authorities to cease use of, or to recommend against the use of, our products and services.

Governmental agencies throughout the world, but particularly in the United States where the majority of our customers are based, strictly regulate the biopharmaceutical development process. Our business involves helping biopharmaceutical companies strategically and tactically navigate the regulatory approval process. New or amended regulations are expected to result in higher regulatory standards and often additional revenues for companies that service these industries. However, some changes in regulations, such as a relaxation in regulatory requirements or the introduction of streamlined or expedited approval procedures, or an increase in regulatory requirements that we have difficulty satisfying or that make our regulatory strategy services less competitive, could eliminate or substantially reduce the demand for our regulatory services.

Competition

The market for our biosimulation products and related services for the biopharmaceutical industry is competitive and highly fragmented. In biosimulation software, we compete with other scientific software providers, technology companies, in-house development by biopharmaceutical companies, and certain open source solutions. In the technology-driven services market, we compete with specialized companies, in-house teams at biopharmaceutical companies, and academic and government institutions. In some standard biosimulation services, and in regulatory and market access, we also compete with contract research organizations. Some of our competitors and potential competitors have longer operating histories in certain segments of our industry than we do and could have greater financial, technical, marketing, R&D, and other resources. Some of our competitors offer products and services directed at more specific markets than those we

target, enabling these competitors to focus a greater proportion of their efforts and resources on those specific markets. Some competing products are developed and made available at lower cost by government organizations and academic institutions, and these entities may be able to devote substantial resources to product development. Some clinical research organizations or technology companies may decide to enter into or expand their offerings in the biosimulation area, whether through acquisition or internal development. We also face competition from open source software initiatives, in which developers provide software and intellectual property free of charge, such as R and PK-Sim software. In addition, some of our customers spend significant internal resources in order to develop their own solutions.

Impact of COVID-19

As of December 31, 2021, we believe there have been and will be short-term impacts on our business due to the Omicron variant. With the COVID-19-related slowdown in closing out clinical trials, there have been delays in regulatory services projects. Furthermore, the increase in COVID-19 cases with the Omicron variant reduced the capacity of our employees and clients. We believe that these are transitory factors that we are well-equipped to manage going forward.

non-GAAP measures

Management uses various financial metrics, including total revenues, income from operations, net income, and certain metrics that are not required by, or presented in accordance with, GAAP, such as Adjusted EBITDA, Adjusted Net Income, and Adjusted Diluted Earnings Per Share, to measure and assess the performance of our business, to evaluate the effectiveness of our business strategies, to make budgeting decisions, to make certain compensation decisions, and to compare our performance against that of other peer companies using similar measures. We believe that presentation of the GAAP and the non-GAAP metrics in this filing will aid investors in understanding our business.

Management measures operating performance based on Adjusted EBITDA defined for a particular period as net income (loss) excluding interest expense, provision (benefit) for income taxes, depreciation and amortization expense, intangible asset amortization, equity-based compensation expense, acquisition and integration expense, and other items not indicative of our ongoing operating performance. Management also measures operating performance based on Adjusted Net Income defined for a particular period as net income (loss) excluding, equity-based compensation expense, acquisition and integration expense, and other items not indicative of our ongoing operating performance. Further, management measures operating performance based on Adjusted Diluted Earnings Per Share defined for a particular period as Adjusted Net Income divided by the weighted-average diluted common shares outstanding.

We believe Adjusted EBITDA, Adjusted Net Income, and Adjusted Diluted Earnings Per Share are helpful to investors, analysts, and other interested parties because they can assist in providing a more consistent and comparable overview of our operations across our historical periods. In addition, these measures are frequently used by analysts, investors, and other interested parties to evaluate and assess performance.

Adjusted EBITDA, Adjusted Net Income, and Adjusted Diluted Earnings Per Share are non-GAAP measures and are presented for supplemental purposes only and should not be considered as an alternative or substitute to financial information presented in accordance with GAAP. Adjusted EBITDA, Adjusted Net Income and Adjusted Diluted Earnings Per Share have certain limitations in that they do not include the impact of certain expenses that are reflected in our consolidated statements of operations that are necessary to run our business. Other companies, including other companies in our industry, may not use these measures and may calculate both differently than as presented, limiting the usefulness as a comparative measure.

The following table reconciles Net loss to Adjusted EBITDA :

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
		(in thousands)	
Net loss	$ (13,266)	$ (49,397)	$ (8,926)
Interest expense[a]	16,837	25,296	28,004
Interest income[a]	(271)	(44)	(9)
(Benefit from) provision for income taxes[a]	9,891	(784)	(225)
Depreciation and amortization expense[a]	2,135	2,443	2,596
Intangible asset amortization[a]	42,980	40,310	38,964
Currency (gain) loss[a]	(175)	715	431
Equity-based compensation expense[b]	29,483	64,507	1,691
Acquisition-related expense[c]	11,241	1,456	2,471
Integration expense[d]	31	78	546
Transaction related expenses[e]	2,754	1,908	—
Severance expense[f]	60	557	2,057
Reorganization expense[g]	—	525	222
Loss on disposal of fixed assets[h]	351	19	113
Executive recruiting expense[i]	733	288	476
First-year Sarbanes-Oxley and ASC 842 implementation costs[j]	929	—	—
Adjusted EBITDA	103,713	87,877	68,411

The following table reconciles Net loss to Adjusted Net Income(Loss):

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
		(in thousands)	
Net loss	$ (13,266)	$ (49,397)	$ (8,926)
Currency (gain) loss[a]	(175)	715	431
Equity-based compensation expense[b]	29,483	64,507	1,691
Acquisition-related expense[c]	11,241	1,456	2,471
Integration expense[d]	31	78	546
Transaction related expenses[e]	2,754	1,908	—
Severance expense[f]	60	557	2,057
Reorganization expense[g]	—	525	222
Loss on disposal of fixed assets[h]	351	19	113
Executive recruiting expense(i)	733	288	476
First-year Sarbanes-Oxley and ASC 842 implementation costs(j)	929	—	—
Income tax expense impact of adjustments[k]	(6,347)	(1,381)	(1,758)
Adjusted Net Income	25,794	19,275	(2,677)

The following table reconciles diluted earnings per share to Adjusted Diluted Earnings Per Share:

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
Net loss	$ (0.09)	$ (0.37)	$ (0.07)
Currency (gain) loss[a]	—	0.01	—
Equity-based compensation expense[b]	0.19	0.48	0.01
Acquisition-related expense[c]	0.07	0.01	0.02
Integration expense[d]	—	—	0.01
Transaction related expenses[e]	0.02	0.01	—
Severance expense[f]	—	0.01	0.02
Reorganization expense[g]	—	0.01	—
Loss on disposal of fixed assets[h]	—	—	—
Executive recruiting expense[i]	0.01	—	0.01
First-year Sarbanes-Oxley and ASC 842 implementation costs[j]	0.01	—	—
Income tax expense impact of adjustments[k]	(0.04)	(0.01)	(0.01)
Adjusted Diluted Earnings Per Shares	0.17	0.15	(0.01)
Basic weighted average common shares outstanding	149,842,668	133,247,212	132,407,786
Effect of potentially dilutive shares outstanding [l]	4,401,021	229,383	0
Adjusted diluted weighted average common shares outstanding	154,243,689	133,476,595	132,407,786

(a) Represents amounts as determined under GAAP.

(b) Represents expense related to equity-based compensation. Equity-based compensation has been, and will continue to be for the foreseeable future, a recurring expense in our business and an important part of our compensation strategy.

(c) Represents costs associated with mergers and acquisitions and any retention bonuses pursuant to the acquisitions.

(d) Represents integration costs related to post-acquisition integration activities.

(e) Represents costs associated with our public offerings that are not capitalized.

(f) Represents charges for severance provided to former executives and non-executives.

(g) Represents expense related to reorganization, including legal entity reorganization.

(h) Represents the gain/loss related to disposal of fixed assets.

(i) Represents recruiting and relocation expenses related to hiring senior executives.

(j) Represents the first-year Sarbanes-Oxley costs for accounting and consulting fees related to the Company's preparation to comply with Section 404 of the Sarbanes-Oxley Act in 2021, as well as implementing cost of ASC 842.

(k) Represents the income tax effect of the non-GAAP adjustments calculated using the applicable statutory rate by jurisdiction.

(l) Represents potentially dilutive shares that were excluded from the Company's GAAP diluted weighted average common shares outstanding because the Company had a reported net loss and therefore including these shares would have been anti-dilutive.

Components of Results of Operations

Revenues

Our business generates revenue from the sales of software products and delivery of consulting services.

- ***Software***. Our software business generates revenues from software licenses, software subscriptions and software maintenance as follows:
  - *Software licenses*: We recognize revenue for software license fees upfront, upon delivery of the software license.
  - *Software subscription*: Subscription revenue consists of subscription fees to provide our customers access to and related support for our cloud-based solutions. We recognize subscription fees ratably over the term of the subscription, usually one to three years. Any subscription revenue paid upfront that is not recognized in the current period is included in deferred revenue in our consolidated balance sheet until earned.
  - *Software maintenance*: Software maintenance revenue includes fees for providing updates and technical support for software offerings. Software maintenance revenue is recognized ratably over the contract term, usually one year.
- ***Services***. Our services business generates revenues primarily from technology-driven services and professional services, which include software implementation services. Our service arrangements are time and materials, fixed fee, or prepaid. Revenues are recognized over the time services are performed for time and materials, and over time by estimating progress to completion for fixed fee and prepaid services.

Cost of Revenues

Cost of revenues consists primarily of employee related expenses, equity-based compensation, the costs of third-party subcontractors, travel costs, distributor fees, amortization of capitalized software and allocated overhead. We may add or expand computing infrastructure service providers, make additional investments in the availability and security of our solutions, or add resources to support our growth.

Operating Expenses

- ***Sales and Marketing***. Sales and marketing expense consists primarily of employee-related expenses, equity-based compensation, sales commissions, brand development, advertising, travel-related expenses and industry conferences and events. We plan to continue to invest in sales and marketing to increase penetration of our existing client base and expand to new clients.
- ***Research and Development***. Research and development expense accounts for a significant portion of our operating expenses. We recognize expenses as incurred. Research and development expenses consist primarily of employee-related expenses, equity-based compensation, third-party consulting, allocated software costs and tax credits. We plan to continue to invest in our R&D efforts to enhance and scale our software product offerings by development of new features and increased functionality.
- ***General and Administrative***. General and administrative expense consists of personnel-related expenses associated with our executive, legal, finance, human resources, information technology, and other administrative functions, including salaries, benefits, bonuses, and equity-based compensation. General and administrative expense also includes professional fees for external legal, accounting and other consulting services, allocated overhead costs, and other general operating expenses.

We expect to increase the size of our general and administrative staff to support the anticipated growth of our business. As a public company, we expect to incur significant expenses on an ongoing basis that we did not incur as a private company. Those costs include additional director and officer liability insurance expenses, as well as third-party and internal resources related to accounting, auditing, SOX compliance, legal, and investor and public relations expenses. As a result, we expect the dollar amount of our general and administrative expense to increase for the foreseeable future. Excluding public company expenses, we expect general and administrative expense to grow at a rate lower than revenues.

- ***Intangible Asset Amortization***. Intangible asset amortization consists primarily of amortization expense related to intangible assets recorded in connection with acquisitions and amortization of capitalized software development costs.

- ***Depreciation and Amortization Expense***. Depreciation and amortization expense consists of depreciation of property and equipment and amortization of leasehold improvements.

Other Expenses

- ***Interest Expense***. Interest expense consists primarily of interest expense associated with the Credit Agreement, including amortization of debt issuance costs and discounts. We expect interest expense to decline as a result of lower outstanding indebtedness going forward.

- ***Miscellaneous***. Miscellaneous expense consists of miscellaneous non-operating expenses primarily comprised of foreign exchange transaction gains and losses.

- ***Provision for (Benefit from) Income Taxes***. Provision for (benefit from) income taxes consists of U.S. federal and state income taxes and income taxes in certain foreign jurisdictions in which we conduct business. We expect income tax expense to increase over time as the Company continues to grow net income.

Acquisitions

On March 2, 2021, we completed a transaction which qualified as a business combination for a total consideration of $2.7 million. The business combination was not material to our consolidated financial statements. Based on the Company's preliminary purchase price allocation, approximately $1.2 million, $0.1 million and $1.2 million of the purchase price was assigned to customer relationships, non-compete agreements and goodwill, respectively.

On June 7, 2021, we completed a transaction which qualified as a business combination for a total consideration of $15.2 million. The business combination was not material to our consolidated financial statements. Based on the Company's preliminary purchase price allocation, approximately $7.4 million and $4.7 million of the purchase price was assigned to customer relationships and goodwill, respectively.

On October 1, 2021, we completed the acquisition of 100% of the equity of Pinnacle for a total consideration of $339.1 million, consisting of cash $266.3 million ($246.9 million net with cash acquired from the acquisition) and 2,239,717 shares of restricted common stock of the Company. Based on the Company's preliminary purchase price allocation, approximately $15.8 million, $103.0 million, $24.6 million and $183.9 million of the purchase price was assigned to trademark, acquired software, customer relationships, and goodwill, respectively. Pinnacle has been included in our consolidated results of operations since the date of acquisition.

Also, after year end 2021, on January 3, 2022, we completed the acquisition of Integrated Nonclinical Development Solutions, Inc. (INDS), a company that provides the SEND Explorer® software and drug development consulting, for total

consideration of $7.1 million. We will complete the initial accounting for the acquisition of INDS, including the allocation of purchase consideration, in the first quarter of 2022.

For more information about our acquisitions, see NOTE 5. “Business Combinations” in the notes to the Consolidated Financial Statements.

Results of Operations

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
	(dollars in thousands)		
Statement of operations data:			
Revenues	$ 286,104	$ 243,530	$ 208,511
Cost of revenues	111,616	100,765	79,770
Operating expenses:			
Sales and marketing	20,141	19,202	10,732
Research and development	20,379	19,644	11,633
General and administrative	79,539	88,482	47,926
Intangible asset amortization	38,715	37,414	36,241
Depreciation and amortization expense	2,135	2,443	2,596
Total operating expenses	160,909	167,185	109,128
Income (loss) from operations	13,579	(24,420)	19,613
Other expenses:			
Interest expense	(16,837)	(25,296)	(28,004)
Miscellaneous, net	(117)	(465)	(760)
Total other expenses	(16,954)	(25,761)	(28,764)
Loss before income taxes	(3,375)	(50,181)	(9,151)
Provision for (benefit from) income taxes	9,891	(784)	(225)
Net Loss	$ (13,266)	$ (49,397)	$ (8,926)

Comparison of the Years Ended December 31, 2021 and 2020

Revenues

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Software	$ 86,825	$ 73,463	$ 13,362	18 %
Services	199,279	170,067	29,212	17 %
Total revenues	$ 286,104	$ 243,530	$ 42,574	17 %

Revenues increased by $42.6 million, or 17%, to $286.1 million for the year ended December 31, 2021, as compared to the same period in 2020. Excluding $6.1 million revenue from Pinnacle 21, which was acquired in the fourth quarter of 2021, the revenues increased $36.4 million, or 15% for the year ended December 31, 2021 as compared to the same period in 2020. The overall increase in revenues was primarily a result of growth in our technology enabled services and software product offerings from strong renewal rates, client expansions and new customers.

Software revenue increased by $13.4 million, or 18%, to $86.8 million for the year ended December 31, 2021 as compared to the same period in 2020, driven primarily by growth in sales of our software subscriptions of 29%, or $9.6 million and sales of our software licenses of 10%, or $3.7 million. Excluding $5.7 million revenue from Pinnacle 21, the revenue from software subscription increased $3.9 million, or 12%. The overall growth is primarily attributable to maintaining high net revenue retention rates and renewal rates for our core software products, growth from acquisitions and new customers.

Services revenue increased by $29.2 million, or 17%, to $199.3 million for the year ended December 31, 2021, as compared to the same period in 2020, primarily driven by growth in our technology-driven services product lines, which increased by 18%, or $29.5 million. The growth in overall services revenue is primarily attributable to strong growth in biosimulation and regulatory services from client expansions with ACV greater than $0.1 million and new customers.

Cost of Revenues

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Cost of revenues	$ 111,616	$ 100,765	$ 10,851	11 %

Cost of revenues increased by $10.9 million, or 11%, to $111.6 million for the year ended December 31, 2021, as compared to 2020. The increase was primarily due to a $10.0 million increase in employee-related costs resulting from billable head count growth, a $2.8 million increase in consulting costs, and $1.4 million increase in intangible assets amortization, partially offset by a $3.6 million decrease in stock-based compensation cost. Excluding $0.8 million expense from Pinnacle, the cost of revenue increased $10.1 million.

Sales and Marketing Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Sales and marketing	$ 20,141	$ 19,202	$ 939	5 %
% of total revenues	7 %	8 %		

Sales and marketing increased by $0.9 million, or 5%, to $20.1 million for the year ended December 31, 2021, as compared to 2020. Sales and marketing expenses increased primarily due to a $5.4 million increase in employee-related costs resulting from head count growth and a $0.5 million increase in professional and consulting costs as well as $0.1 million increase in equipment and software expenses, partially offset by a $5.2 million decrease in stock-based compensation cost.

Research and Development Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Research and development	$ 20,379	$ 19,644	$ 735	4 %
% of total revenues	7 %	8 %		

Research and development expenses increased by $0.7 million, or 4%, to $20.4 million for the year ended December 31, 2021 as compared to 2020. The increase in R&D expenses was primarily due to a $5.1 million increases in employee-related costs resulting from head count growth, partially offset by a $4.3 million decrease in stock-based compensation cost. Excluding $1.3 million expense in research and development from Pinnacle, the research and development expense decreased $0.6 million.

General and Administrative Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
General and administrative	$ 79,539	$ 88,482	$ (8,943)	(10)%
% of total revenues	28 %	36 %		

General and administrative expenses decreased by $8.9 million, or 10 %, to $79.5 million for the year ended December 31, 2021 as compared to 2020. The decrease was primarily due to a $24.4 million decrease in employee-related costs resulting from a $22.0 million decrease in stock-based compensation cost and a $2.4 million decrease in other-employee related costs. The decreases were partially offset by increase of $10.7 million in acquisition costs, $2.7 million in insurance expenses, $1.0 million increase in public company expense, and $0.8 million increase in stock offering transaction cost.

Intangible Asset Amortization Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Intangible asset amortization	$ 38,715	$ 37,414	$ 1,301	3 %
% of total revenues	14 %	15 %		

Intangible asset amortization expense increased by $1.3 million, or 3%, to $38.7 million for the year ended December 31, 2021 as compared to 2020. The increase in intangible asset amortization was primarily the result of increased amortization in acquired intangible assets. Excluding $2.4 million expense in intangible asset amortization from Pinnacle, the intangible asset amortization expense decreased $1.1 million.

Depreciation and Amortization Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Depreciation and amortization	$ 2,135	$ 2,443	$ (308)	(13)%
% of total revenues	1 %	1 %		

Depreciation and amortization expense decreased by $0.3 million, or (13) %, to $2.1 million for the year ended December 31, 2021 as compared to 2020. The decrease in depreciation and amortization expense was primarily due to the decrease in average carrying balances of fixed assets in 2021 compared to 2020.

Interest Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Interest expense	$ 16,837	$ 25,296	$ (8,459)	(33)%
% of total revenues	6 %	10 %		

Interest expense decreased by $8.5 million, or 33%, to $16.8 million for the year ended December 31, 2021 as compared to 2020. The decrease in interest expense was primarily due to lower average outstanding principal balances on our credit facilities in 2021 compared to the same period in 2020. The decrease in interest expense was partially offset by interest expense reclassified as interest from other comprehensive income due to hedge ineffectiveness.

Miscellaneous, net

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Miscellaneous, net	$ 117	$ 465	$ (348)	(75)%
% of total revenues	0 %	0 %		

Miscellaneous expenses decreased by $0.3 million, or 75%, to $0.1 million for the year ended December 31, 2021 as compared to 2020. The decrease in miscellaneous expenses was primarily due to increase in currency gain, partially offset by increase in loss from fixed asset disposals.

(Benefit from) Provision for Income Taxes

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Provision for (benefit from) income taxes	$ 9,891	$ (784)	$ 10,675	nm
Effective tax rate	(293.1)%	1.6 %		

Our income tax expense was $9.9 million, resulting in an effective income tax rate of (293.1)%, for the year ended December 31, 2021, as compared to an income tax benefit of $0.8 million, or an effective income tax rate of 1.6%, in 2020. Our income tax expense for the year ended December 31, 2021 was primarily due to the impact of rate changes in certain jurisdictions, the impact of non-deductible items, and the relative mix of domestic and international earnings.

Net Loss

	YEAR ENDED DECEMBER 31,		CHANGE	
	2021	2020	$	%
	(dollars in thousands)			
Net loss	$ (13,266)	$ (49,397)	$ 36,131	(73)%

Net loss decreased by $36.1 million, or 73%, to $13.3 million for the year ended December 31, 2021, as compared to the same period in 2020. The decrease was primarily due to increase in revenues and decrease in stock-based compensation expense and interest costs in 2021 compared to 2020, partially offset by increase in cost of revenue, employee-related costs, acquisition costs, and taxes.

Comparison of the Year Ended December 31, 2020 and 2019

Revenues

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
Software	$ 73,463	$ 68,341	$ 5,122	7 %
Services	170,067	140,170	29,897	21 %
Total revenues	$ 243,530	$ 208,511	$ 35,019	17 %

Revenues increased by $35.0 million, or 17%, to $243.5 million for the year ended December 31, 2020 as compared to the same period in 2019. The increase in revenues was the result of growth in our technology enabled services and software product offerings from strong renewal rates and client expansions.

Software revenue increased by $5.1 million, or 7%, to $73.5 million for the year ended December 31, 2020 as compared to the same period in 2019, driven primarily by growth in sales of our software licenses of 10%, or $3.3 million and subscriptions revenue of 8%, or $2.3 million, partially offset by a decline in software maintenance revenue of $0.5 million. The growth is attributable to maintaining high net revenue retention rates and renewal rates for our core software products.

Services revenue increased by $29.9 million, or 21%, to $170.1 million for the year ended December 31, 2020 as compared to the same period in 2019, primarily driven by organic growth in our technology-driven services product lines of 23%, or $30.6 million, partially offset by a $0.7 million decrease in professional services offerings. The growth is primarily attributable to strong growth in biosimulation and regulatory services from client expansions and new customer acquisition.

Cost of Revenues

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
Cost of revenues	$ 100,765	$ 79,770	$ 20,995	26 %

Cost of revenues increased by $21.0 million, or 26%, to $100.8 million for the year ended December 31, 2020 as compared to 2019. The increase was primarily due to a $8.6 million increase in stock-based compensation driven by the exchange of performance vesting Class B Units in connection with the December 2020 offering and an increase to employee-related costs of $8.6 million related to increased headcount. The remaining increase is due to consulting costs and bonus expense, partially offset by decreases in travel related costs, retention, and software expenses.

Sales and Marketing Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
Sales and marketing	$ 19,202	$ 10,732	$8,470	79%
% of total revenues	8 %	5 %		

Sales and marketing increased by $8.5 million, or 79%, to $19.2 million for the year ended December 31, 2020 as compared to 2019. The increase was primarily due to a $7.3 million increase in stock-based compensation driven by the exchange of performance vesting Class B Units in connection with the December 2020 offering. The remainder of the increase is due to sales commissions, employee-related costs, and other marketing costs, offset by decreases in advertising and tradeshow, travel and entertainment, bonus, and consulting expenses.

Research and Development Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
Research and development	$ 19,644	$ 11,633	$8,011	69 %
% of total revenues	8 %	6 %		

Research and development expenses increased by $8.0 million, or 69%, to $19.6 million for the year ended December 31, 2020 as compared to 2019. The increase was primarily due to a $7.0 million increase in stock-based compensation driven by the exchange of performance vesting Class B Units in connection with the December 2020 offering. The remaining increase was due to employee-related costs, consulting expenses, and bonus expense, partially offset by lower capitalization of software development costs, tax credits, and travel and entertainment spend.

General and Administrative Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
General and administrative	$ 88,482	$ 47,926	$40,556	85 %
% of total revenues	36 %	23 %		

General and administrative expenses increased by $40.6 million, or 85%, to $88.5 million for the year ended December 31, 2020 as compared to 2019. The increase was primarily due to a $39.8 million increase in stock-based compensation driven by the exchange of performance vesting Class B Units in connection with the December 2020 offering. The remaining increase is due to increases in professional fees, IPO transaction costs, employee-related costs, bonus expense, IT-related costs, and D&O insurance coverage, partially offset by decreases in travel and entertainment spend, severance expenses, restructuring costs, acquisitions and integration costs, and office supply expense.

Intangible Asset Amortization Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
Intangibles asset amortization	$ 37,414	$ 36,241	$1,173	3 %
% of total revenues	15 %	17 %		

Intangible asset amortization expense increased by $1.2 million, or 3%, to $37.4 million for the year ended December 31, 2020 as compared to 2019. The increase in intangible asset amortization was a direct result of increases in capitalized software development costs and increases in acquired intangible assets.

Depreciation and Amortization Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
Depreciation and amortization	$ 2,443	$ 2,596	$(153)	(6)%
% of total revenues	1 %	1 %		

Depreciation and amortization expense of $2.4 million was relatively flat for the year ended December 31, 2020 as compared to 2019.

Interest Expense

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
Interest expense	$ 25,296	$ 28,004	$(2,708)	(10)%
% of total revenues	10 %	13 %		

Interest expense decreased by $2.7 million, or 10%, to $25.3 million for the year ended December 31, 2020 as compared to 2019. The decrease in interest expense was primarily due to lower outstanding debt resulting from the payoff of our higher interest term loans and lower interest rates on the outstanding debt.

Miscellaneous, net

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
Miscellaneous, net	$ 465	$ 760	$(295)	(39)%
% of total revenues	0 %	0 %		

Miscellaneous expenses decreased by $0.3 million, or 39%, to $0.5 million for the year ended December 31, 2020 as compared to 2019. The decrease in miscellaneous expenses was primarily due to a $0.2 million decrease in asset disposals and sublease losses and $0.2 million of Australian stimulus income provided by the Australian government, partially offset by $0.3 million of unfavorable foreign currency exchange rate fluctuations compared to the U.S. dollar, particularly with the pound sterling.

(Benefit from) Provision for Income Taxes

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
(Benefit from) provision for income taxes	$ (784)	$ (225)	$(559)	248 %
Effective income tax rate	1.6 %	2.5 %		

Our income tax benefit was $0.8 million, resulting in an effective income tax rate of 1.6%, for the year ended December 31, 2020, as compared to an income tax benefit of $0.2 million, or an effective income tax rate of 2.5%, in 2019. Our income tax benefit for the year ended December 31, 2020 was primarily due to the tax effects of the U.S. pre-tax loss and the impact of tax rate changes in certain jurisdictions.

Net Loss

	YEAR ENDED DECEMBER 31,		CHANGE	
	2020	2019	$	%
	(dollars in thousands)			
Net Loss	$ (49,397)	$ (8,926)	$(40,471)	453 %

Net loss increased by $40.5 million, or 453%, to $49.4 million for the year ended December 31, 2020 as compared to the same period in 2019. The increase was primarily due to an increase in operating expenses, namely general and administrative expenses, sales and marketing, and research and development expenses.

Liquidity and Capital Resources

We have consistently generated positive cash flow from operations, providing $60.4 million, $44.8 million, and $38.0 million as a source of funds each year for the years ended December 31, 2021, 2020, and 2019. Our additional liquidity comes from several sources: maintaining adequate balances of cash and cash equivalents, issuing common stock, and

accessing credit facilities and revolving line of credit. The following table provides a summary of the major sources of liquidity as of and for the years ended December 31, 2019, through 2021.

	2021	2020	2019
		(in thousands)	
Net cash from operating activities	$ 60,388	$ 44,810	$ 38,025
Cash and cash equivalents[1]	$ 185,797	$ 271,382	$ 29,256
proceeds from issuing common stock	$ 133,351	$ 316,301	$ —
Term loan credit facilities	$ 300,490	$ 304,099	$ 408,170
Revolving line of credit	$ 100,000	$ 20,000	$ 20,000

(1) Cash balance as of December 31, 2021 included $39.8 million cash and cash equivalents held outside of the United States.

Our material cash requirements from known contractual obligations as of December 31, 2021 is as follows:

	TOTAL	LESS THAN 1 YEAR	1 TO 3 YEARS	3 TO 5 YEARS	MORE THAN 5 YEARS
			(in thousands)		
Lease obligations:					
Operating leases	$ 14,339	$ 5,138	$ 5,810	$ 3,256	$ 135
Finance leases[1]	329	304	25	—	—
Principal payments of long-term debt	300,490	3,020	6,040	291,430	—
Interest on long-term debt[2]	50,095	10,939	21,577	17,579	—
Total	$ 365,253	$ 19,401	$ 33,452	$ 312,265	$ 135

(1) Inclusive of interest expense.

(2) Represents the expected cash payments for interest on our long-term debt based on the amounts outstanding as of the end of each period and the interest rates applicable on such debt as of December 31, 2021.

We believe our existing sources of liquidity will be sufficient to meet our working capital, capital expenditures, and contractual obligations for the foreseeable future. We believe we will meet longer-term expected future cash requirements and obligations through a combination of cash flows from operating activities, available cash balances, and potential future equity or debt transactions.

Our future capital requirements, however, will depend on many factors, including funding for potential acquisitions, investments, and other growth and strategic opportunities, which could increase our cash requirements. While we believe we have, and will be able to generate, sufficient liquidity to fund our operations for the foreseeable future, our sources of liquidity could be affected by factors described under “Risk Factors” elsewhere in this filing.

Cash Flows

The following table presents a summary of our cash flows for the periods shown:

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
Net cash provided by operating activities	$ 60,388	$ 44,810	$ 38,025
Net cash used in investing activities	(269,922)	(8,612)	(9,517)
Net cash provided by (used in) financing activities	123,391	208,214	(8,489)
Effect due to foreign exchange rate changes on cash, cash equivalents, and restricted cash	(524)	(883)	(2,444)
Net(decrease) increase in cash, cash equivalents and restricted cash	$ (86,667)	$ 243,529	$ 17,575
Cash paid for interest	14,169	27,607	26,428
Cash paid for income taxes	8,595	12,278	4,109

Operating Activities

During the year ended December 31, 2021, operating activities provided approximately $60.4 million. The $15.6 million increase in cash from operating activities compared to 2020 was primarily due to a decrease in cash paid in interest and taxes, partially offset by cash paid for accounts payable and accrued expense.

During the year ended December 31, 2020, operating activities provided approximately $44.8 million of cash and cash equivalents, primarily resulting from a net loss of $49.4 million, offset by $100.9 million of non-cash operating expenses inclusive of depreciation and amortization, amortization of debt issuance costs, equity-based compensation costs, and deferred income taxes. Changes in our operating assets and liabilities used cash and cash equivalents of approximately $6.7 million.

During the year ended December 31, 2019, operating activities provided approximately $38.0 million of cash and cash equivalents, primarily resulting from a net loss of $8.9 million, offset by $38.2 million of non-cash operating expenses inclusive of depreciation and amortization, amortization of debt issuance costs, equity-based compensation costs, and deferred income taxes. Changes in our operating assets and liabilities provided cash and cash equivalents of approximately $8.7 million.

Investing Activities

During the year ended December 31, 2021, investing activities used approximately $269.9 million of cash, an increase of $261.3 million, compared to $8.6 million in 2020. Cash used in investing activities was primarily for investing in business acquisitions and capitalized software development to support our growth.

During the year ended December 31, 2020, investing activities used approximately $8.6 million of cash, primarily for investing in capital expenditures and capitalized software development to support our growth.

During the year ended December 31, 2019, investing activities used approximately $9.5 million of cash, primarily for investing in capital expenditures and capitalized software development to support our growth.

Financing Activities

During the year ended December 31, 2021, financing activities provided approximately $123.4 million, compared to $208.2 million in the same period of 2020. The $84.8 million decrease in cash from financing activities was primarily due to $183.0 million less proceeds from stock offerings in 2021 compared to 2020. The decrease was partially offset by $100.4 million decrease in debt payment in 2021.

During the year ended December 31, 2020, financing activities provided approximately $208.2 million of cash, primarily attributable to proceeds from issuance of common stock in connection with our IPO, partially offset by payments on long-term debt.

During the year ended December 31, 2019, financing activities used approximately $8.5 million of cash, primarily attributable to payments on long-term debt, capital lease obligations, our revolving credit facility, and unit repurchases, partially offset by proceeds from capital contributions.

Indebtedness

Credit Facilities

We are a party to a Credit Agreement that originally provided for a $250.0 million senior secured term loan and commitments under a revolving credit facility in an aggregate principal amount of $20.0 million, with a sub-commitment for issuance of letters of credit of $10.0 million. The loans were originally scheduled to mature on August 14, 2024, with respect to the term loan thereunder, and August 14, 2022, with respect to the revolving credit facility thereunder.

In January 2018, we and the lenders amended the Credit Agreement to add incremental term loans in the amount of $25.0 million to be used for our general corporate purposes. Additionally, in April 2018, we and the lenders amended the Credit Agreement to (i) add incremental term loans in the amount of $40.0 million to be used for our general corporate purposes and (ii) provide a reduction of 50 basis points in the margin under the term loan. The terms of such incremental term loans were the same as the terms of our existing term loans, including in respect of maturity, and are considered an increase in the aggregate principal amount of the existing term loans outstanding under the Credit Agreement and are part of the existing term loan.

We entered into a third restated and amended loan agreement on June 17, 2021 (“Third Amendment”), which provides for, among other things, (i) the extension of the termination date applicable to the revolving credit commitments under the Credit Agreement to August 2025, (ii) the extension of the maturity date applicable to the term loans under the Credit Agreement to August 2026, and (iii) an increase of approximately $80.0 million in commitments available under the revolving line of credit (resulting in an aggregate amount of commitments of $100.0 million). The term loan under the Third Amendment has substantially the same terms as the existing term loans and revolving credit commitments. The Credit Agreement is collateralized by substantially all U.S. assets and stock pledges for the non-U.S. subsidiaries and contain various financial and nonfinancial covenants.

Borrowings under the Credit Agreement currently bear interest at a rate per annum equal to either (i) the Eurocurrency rate, with a floor of 0.00%, as adjusted for the reserve percentage required under regulations issued by the Federal Reserve Board for determining maximum reserve requirements with respect to Eurocurrency funding, plus an applicable margin rate of 3.50% for the term loan and between 4.00% and 3.50% for revolving credit loans, depending on the applicable first lien leverage ratio, or (ii) an alternative base rate (“ABR”), with a floor of 1.00%, plus an applicable margin rate of 2.50% for the term loan or between 3.00% and 2.50% for revolving credit loans, depending on the applicable first lien leverage ratio (with the ABR determined as the greatest of (a) the prime rate, (b) the federal funds effective rate, plus 0.50%), and (c) the Eurocurrency rate plus 1.00%.

Additionally, we are obligated to pay under the revolving credit facility (i) a commitment fee of between 0.50% and 0.25% per annum of the unused amount of the revolving credit facility, depending on the applicable first lien leverage ratio, (ii) customary letter of credit issuance and participation fees, and (iii) other customary fees and expenses of the letter of credit issuers.

All obligations under the Credit Agreement are unconditionally guaranteed by our wholly owned direct and indirect subsidiaries, subject to certain exceptions. All obligations under the Credit Agreement, and the guarantees of those obligations, are secured on a first lien basis, subject to certain exceptions, by substantially all of our assets and the assets of the other guarantors.

As of December 31, 2021, we had $300.5 million of outstanding borrowings on the term loan, and $100.0 million of availability under the revolving credit facility under the Credit Agreement, and outstanding letters of credit of $0.2 million under the Credit Agreement. As of December 31, 2021, we were in compliance with the covenants of the Credit Agreement.

Income Taxes

We recorded income tax expense of $9.9 million for the year ended December 31, 2021 and income tax benefit of $0.8 million for the year ended December 31, 2020.

As of December 31, 2021, we had federal and state NOLs of approximately $2.4 million and $2.6 million, respectively, which are available to reduce future taxable income and expire between 2024 and 2040 and 2029 and 2039, respectively. We had federal and state R&D tax credit carryforwards of approximately $1.5 million and $0.4 million, respectively, to offset future income taxes, which expire between 2038 and 2041. We also had foreign tax credits of approximately $15.1 million, which will start to expire in 2025. These carryforwards that may be utilized in a future period may be subject to limitations based upon changes in the ownership of our stock in a future period. Additionally, we carried forward foreign NOLs of approximately $24.5 million which will start to expire in 2022, foreign research and development credits of $0.4 million which expire in 2029, and Canadian investment tax credits of approximately $3.8 million which expire between 2030 and 2039. Our carryforwards are subject to review and possible adjustment by the appropriate taxing authorities.

As required by Accounting Standards Codification (‘‘ASC’’) Topic 740, Income Taxes, our management has evaluated the positive and negative evidence bearing upon the realizability of our deferred tax assets, which are composed principally of NOL carryforwards, R&D credit carryforwards, investment tax credit carryforward, and foreign tax credit carryforwards. Management has determined that it is more likely than not that we will not realize the benefits of foreign tax credit carryforwards. At the foreign subsidiaries, management has determined that it is more likely than not that we will not realize the benefits of certain NOL carryforwards. As a result, a valuation allowance of $18.2 million is recorded at December 31, 2021.

Off-Balance Sheet Arrangements

During the periods presented, we did not have, and currently we do not have, any significant off-balance sheet arrangements, as defined under the rules and regulations of the SEC.

Critical Accounting Policies and Estimates

Our management’s discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements, which have been prepared in accordance with GAAP. The preparation of these consolidated financial statements requires us to make judgments and estimates that affect the reported amounts of assets, liabilities, revenues, and expenses and the disclosure of contingent assets and liabilities in our consolidated financial statements. We base our estimates on historical experience, known trends and events, and various other factors that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. On an ongoing basis, we evaluate our judgments and estimates in light of changes in circumstances, facts, and experience. The effects of material revisions in estimates, if any, are reflected in the consolidated financial statements prospectively from the date of change in estimates.

While our significant accounting policies are described in more detail in the notes to our consolidated financial statements appearing elsewhere in this filing, we believe the following accounting policies used in the preparation of our consolidated financial statements require the most significant judgments and estimates.

Revenue Recognition

Application of GAAP related to the measurement and recognition of revenue requires us to make judgments and estimates. Specifically, complex arrangements with nonstandard terms and conditions may require significant contract interpretation to determine the appropriate accounting, including whether promised goods and services specified in an arrangement are distinct performance obligations. Revenue recognition is also impacted by our ability to determine when a contract is probable of collection and to estimate variable consideration. We consider various factors when making these judgments.

Our revenue is primarily derived from the sale of software products and delivery of consulting services. We recognize revenue when control of the promised good or service is transferred to the customer in an amount that reflects the consideration for which we are expected to be entitled in exchange for those services.

Software Licenses and Support

License revenue includes perpetual license fees and term license fees, which provide customers with the same functionality and differ mainly in the duration over which the customer benefits from the use of software. Both revenues from perpetual license and term license performance obligations are generally recognized up front at the point in time when the software license has been delivered. A source of software license revenue is from term and bundled licenses that are time-based arrangements for one or multiple software products sold together with maintenance and support for the term of the license arrangement. We have determined that post-customer support and the right to unspecified enhancements and upgrades on a "when-and-if-available" basis included with term licenses is an immaterial component of the transaction price and, therefore, recognize these performance obligation components up front with the license when delivered.

Software Services

For contracts that include multiple performance obligations, such as a software license plus software training, implementation, and/or maintenance/support, or in contracts where there are multiple software licenses, the transaction price is allocated to each of the performance obligations on a pro-rata basis based on the relative standalone selling price of each performance obligation. Maintenance services agreements consist of fees for providing software updates and for providing technical support for software products for a specified term. Revenues allocated to maintenance services are recognized ratably over the contract term beginning on the delivery date of each offering. Maintenance contracts generally have a term of one year. Expenses related to maintenance and subscription are recognized as incurred. While transfer of control of the software training and implementation performance obligations are performed over time, the services are typically started and completed within a few days. Due to the quick nature of the performance obligation from start to finish and the immaterial amounts, we recognize any software training or implementation revenue at the completion of the service. Any unrecognized portion of amounts paid in advance for licenses and services is recorded as deferred revenue.

License revenue and post-contract services are combined and reported as software revenue on the consolidated statements of operations and comprehensive loss.

Subscription Revenues

Subscription revenue consists of subscription fees for access to, and related support for, our cloud-based solutions. We typically invoice subscription fees in advance in annual installments and recognize subscription revenue ratably over the term of the applicable agreement, usually one to three years, which is initially deferred and recognized ratably over the life of the contract. Unearned maintenance and subscription revenues are recorded as deferred revenue. Our subscription services arrangements are generally non-cancelable and do not contain refund-type provisions. In rare instances that subscription services arrangements are deemed cancelable, we will adjust the transaction price and period for revenue recognition accordingly to be reflective of the contract term.

Services and Other Revenues

Services primarily represent advisory services, which may be either strategic consulting services, reporting and analysis services, regulatory writing services, or any combination of the three. Strategic consulting services consists of consulting,

training, and process redesign that enables customers to identify which uncertainties are greatest and matter most and then to design development programs, trial sequences, and individual trials in such a way that those trials systematically reduce the identified uncertainties, in the most rapid and cost-effective manner possible. Our professional services contracts are time and materials, fixed fee, or prepaid. Services revenues are generally recognized over time as the services are performed. Revenues for fixed price services and prepaid are generally recognized over time applying input methods to estimate progress to completion. Training revenues are recognized as the services are performed over time.

Consortium revenues consist of contractual agreements with customers where the customer receives multiple benefits as part of their contract with the Company, as follows: access to the latest version simulator software, which has at least one new release per year, free access to a preset number of training workshops, a block of consulting hours to be used at the customer's discretion, as well as voting rights at the annual consortium meeting where development priorities for the upcoming year are set. The Company's consortium contracts are generally for three years with an annual termination clause and annual upfront billings. Consortium revenues are recognized over time as the benefits of the consortium arrangement are realized over the course of the contract. Both the training and consulting services performance obligations will utilize an output method to measure the progress at the end of each reporting period. As the simulation license was determined to be a functional license with the right to access, the license revenue is recognized evenly over the contract period.

Equity-Based Compensation

Equity-based compensation expense is calculated based on the fair value on the grant date. Upon consummation of the IPO, vested class B units were exchanged for shares of restricted common stock issued by the Company. Although the class B units are not longer outstanding, the grant date fair value of the time based vested class B units will continue to be recognized over the remaining service period of the restricted common stock, and therefore our methods for estimating fair value of our class B units remains relevant.

We estimated the fair value of the class B units using the Monte Carlo option pricing model in 2019 and the Black-Scholes option-pricing model in 2018. In order to derive an estimate of each security class of EQT, we first determined the enterprise value of EQT. To do this we used the enterprise value of the Company as a proxy because the primary asset of EQT is its investment in the Company and therefore the total enterprise value was assumed to be the same.

The three valuation methodologies used to determine the enterprise value, each of which was given equal weighting, include the following:

- The Discounted Cash Flow Method (the "DCF Method"), a form of the Income Approach, was used to estimate the enterprise value by discounting the projected future free cash flows using an appropriate discount rate. We performed the DCF Method using a "debt-free" analysis, which entails estimating the free cash flows available to both debt and equity investors. The DCF Method incorporates several variables of observable and unobservable inputs, including, but not limited to, the Company's prospective financial information and assumes outlays for capital expenditures, future terminal values, an effective tax rate assumption and a discount rate based on a number of factors including market interest rates, a weighted average cost of capital analysis based on an assumed capital structure, and includes adjustments for market risk and company specific risk.

- The Guideline Public Company Method (the "GPC Method"), a form of the Market Approach, was used to estimate the enterprise value by multiplying historical and anticipated financial metrics by a multiple that was derived from an analysis of comparable publicly traded companies. The GPC Method estimates enterprise value based on a comparison of our company to comparable public companies in a similar line of business. From the comparable companies, a representative market multiple is determined and subsequently applied to our historical and prospective financial results to estimate the enterprise value.

- The Merger and Acquisition Method, a form of the Market Approach, was used to estimate the enterprise value by multiplying historical financial metrics by a multiple that was derived from an analysis of companies that were the target of a merger or acquisition transaction.

Application of these approaches involves the use of estimates, judgments and assumptions that are highly complex and subjective, including those regarding our future expected revenue, expenses, cash flows, discount rates, market multiples, the selection of comparable public companies and the probability of future events.

We then subtracted the interest-bearing debt from the enterprise value to determine the operating equity value. The operating equity value is then adjusted for cash and cash equivalents to determine the total equity value.

We then allocated the total equity value of EQT to the Class A Units and the various Class B Units, by utilizing the appropriate option pricing framework. We concluded on the fair value of the Class A Units and the various Class B Units by taking into consideration the relative rights and privileges of the various security classes as well as the following assumptions of the option pricing framework:

Expected Exercise Term. We estimate the expected life of equity awards based upon the timing of a potential liquidity event.

Expected Equity Volatility. Prior to filing the IPO, we were a private entity and therefore, the selected equity volatility was based on the historical and implied volatility of comparable publicly traded companies over a similar expected term. This is representative of the expected future equity volatility of the Company and of the equity volatility of EQT since its equity is similar.

Risk-Free Interest Rates. We based the risk-free interest rate on the rate for a U.S. Treasury zero-coupon issue with a term that closely approximates the expected life of the option grant at the date nearest the option grant date.

The assumptions underlying these valuations represent management's best estimates, which involve inherent uncertainties and the application of management's judgment. As a result, if factors or expected outcomes change and we use significantly different assumptions or estimates, our equity-based compensation expense could be materially different.

Goodwill and Other Intangible Assets

We assess goodwill for impairment at least annually, during the fourth quarter based on balances as of October 1st, and more frequently on an interim basis if we believe indicators of impairment exist. Goodwill is tested for impairment at the reporting unit level, which is one level below or the same as an operating segment. The application of an interim or the annual goodwill impairment test begins with the identification of reporting units, which requires judgment. We determined that we have four reporting units: the software reporting unit ("Software"), the SimCyp reporting unit ("SimCyp"), the Integrated Drug Development reporting unit ("IDD"), and the regulatory writing reporting unit ("Regulatory Writing"), which are within a single operating segment of the Company. The process of evaluating the potential impairment of goodwill is highly subjective and requires significant judgment. Our review of impairment starts with performing a qualitative assessment to determine whether events or circumstances lead to a determination that it is more-likely-than-not that the fair value of the reporting units are less than their carrying amounts.

Our qualitative assessment of the recoverability of goodwill considers various macroeconomic, industry-specific and company-specific factors. These factors include: (1) the nature of the business and the history of the Company and its reporting units from their inception; (2) the economic outlook in general and the condition and outlook of the industry in which the Company and its reporting units operate; (3) the financial condition of the Company and its reporting units; (4) the earnings capacity of the Company and its reporting units; (5) the dividend-paying capacity of the Company and its reporting units; (6) whether goodwill or other intangible value exists within the Company and/or its reporting units; (7) previous sales of the Company's and/or reporting units' stock and the size of the block of stock to be valued; and (8) the market prices of stocks of corporations engaged in the same or a similar line of business having their stocks actively traded in a free and open market, either on an exchange or over-the-counter. After assessing the totality of events and circumstances, if we determine that it is not more-likely-than-not that the fair values of our reporting units are less than their net book values, no further assessment is performed. If we determine that it is more-likely-than-not that the fair values of our reporting units are less than carrying value or if we elect to bypass the qualitative assessment, we proceed to a quantitative assessment or test of goodwill.

If a quantitative assessment of goodwill is required, the determination of the fair value of a reporting unit will involve the use of significant estimates and assumptions. Our quantitative goodwill impairment test uses both the income approach and the market approach to estimate fair value. The income approach is based on the discounted cash flow method that discounts forecasted future cash flows expected to be generated which are based on the Company's estimates of financial performance including revenues, adjusted EBITDA, taxes, and working capital and capital asset requirements. When performing our market approach, we rely specifically on the guideline public company method. Our guideline public company method incorporates revenues and EBITDA multiples from publicly traded companies with operations and other characteristics similar to our entity. If the carrying amount of a reporting unit exceeds its fair value, an impairment loss is recognized in an amount equal to that excess, limited to the total amount of goodwill allocated to that reporting unit.

We performed the annual goodwill impairment analysis during the fourth quarter. The quantitative assessments resulted in no impairment as the estimated fair value of each reporting unit significantly exceeded its carrying value.

Our other intangible assets primarily consist of customer relationship assets, software products acquired in acquisitions, tradenames, software development costs, and non-compete agreements. Other identifiable intangible assets with finite lives, such as software products acquired in acquisitions, non-compete agreements, tradenames, and customer relationship assets, are amortized over their estimated lives using either a straight-line method or a method based on pattern of expected economic benefit of the asset as follows: acquired software — three to ten years; non-compete agreements — two to five years; tradenames — 20 years; customer relationships — 11 to 16 years; and trademarks — 10 to 17 years. The Company evaluates finite intangible assets for impairment whenever events or changes in circumstances indicate that the carrying amount of the asset might not be recoverable. An impairment loss is recognized when estimated undiscounted future cash flows expected to result from the use of the asset are less than its carrying amount.

Software Development Costs

Software development costs are accounted for in accordance with ASC Subtopic 985-20 if the software is to be sold, leased or otherwise marketed, or by ASC Subtopic 350-40 if the software is for internal use. After the technological feasibility of the software has been established (for software to be marketed), or at the beginning of application development (for internal-use software), software development costs, which include primarily salaries and related payroll costs and costs of independent contractors incurred during development, are capitalized. Research and development costs incurred prior to the establishment of technological feasibility (for software to be marketed), or prior to application development (for internal-use software), are expensed as incurred. Software development costs are amortized on a product-by-product basis commencing on the date of general release of the products (for software to be marketed) or the date placed in service (for internal-use software).

Recently Adopted and Issued Accounting Standards

We have reviewed all recently issued standards and have determined that, other than as disclosed in Note 2 to our consolidated financial statements appearing elsewhere in this filing, such standards will not have a material impact on our consolidated financial statements or do not otherwise apply to our operations.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Market risk is broadly defined as potential economic losses due to adverse changes in the fair value of a financial instrument. In the normal course of business, we are exposed to market risks, including foreign currency exchange rate risk and interest rate risk.

Foreign Currency Exchange Rate Risk

We are exposed to foreign currency exchange rate risk by virtue of our international operations. This risk arises because we use different currencies to recognize revenue and pay operating expenses. We derived 29% of our revenue for the year ended December 31, 2021 from operations outside of the United States. Our strategy for managing foreign currency risk relies on efforts to negotiate customer contracts to receive payment in the same currency used to pay expenses. As of

December 31, 2021, we had no outstanding foreign currency forward contracts. Foreign currency exchange rate risk is evidenced in our consolidated financial statements through translation risk and transaction and re-measurement risk.

Translation Risk

We are exposed to movements in foreign currencies, predominately in U.S. dollars, pounds sterling, euros, or Japanese yen, with the majority in U.S. dollars. The vast majority of our contracts are entered into by our U.S. and U.K., E.U., and Japanese subsidiaries. Contracts entered into by our U.S. subsidiaries are almost always denominated in U.S. dollars. Contracts entered into by our other subsidiaries are generally denominated in U.S. dollars, pounds sterling, euros, or Japanese yen, with the majority in U.S. dollars. If the U.S. dollar had weakened 10% or strengthened 10% relative to the pound sterling, the euro, and the Japanese yen in the year ended December 31, 2021, income from operations would have been lower or higher by approximately $2.0 million, based on revenues and costs related to our foreign operations.

Changes in exchange rates between the applicable foreign currency and the U.S. dollar will affect the translation of foreign subsidiaries' financial results into U.S. dollars for purposes of reporting our consolidated financial results. The process by which we translate each foreign subsidiary's financial results to U.S. dollars is as follows:

- we translate statement of operations accounts at the exchange rates on the dates those elements are recognized or the average exchange rates for the relevant monthly period;
- we translate balance sheet asset and liability accounts at the end of period exchange rates; and
- we translate equity accounts at historical exchange rates.

Translation of the balance sheet in this manner affects stockholders' equity through the foreign currency translation adjustment account. This account exists only in the foreign subsidiary's U.S. dollar balance sheet and is necessary to keep the foreign balance sheet, stated in U.S. dollars, in balance.

We report translation adjustments within accumulated other comprehensive loss as a separate component of stockholders' deficit on our consolidated balance sheets. Gains or losses from translating amounts in foreign currencies are recorded in other comprehensive income or other comprehensive loss on our consolidated statements of operations and comprehensive loss.

Transaction and Re-measurement Risk

We have currency risk resulting from the passage of time between the recognition of revenue, invoicing of customers under contracts, and the collection of payment. If a contract is denominated in a currency other than the subsidiary's functional currency, we recognize an unbilled services asset at the time of revenue recognition and a receivable at the time of invoicing for the local currency equivalent of the foreign currency invoice amount. Changes in exchange rates from the time we recognize revenue until the time the customer pays will result in our receiving either more or less in local currency than the amount that was originally invoiced. We recognize this difference as a foreign currency transaction gain or loss, as applicable.

We also have currency risk as a result of intercompany loans or other intercompany borrowings throughout our organization when such intercompany debt is denominated in a currency other than the subsidiary's functional currency. Changes in exchange rates from the time a subsidiary records the intercompany debt until the time the subsidiary pays the intercompany debt will result in a foreign currency transaction gain or loss. We record all foreign currency transaction and re-measurement gains and losses as other income (expense), net on the consolidated statement of operations and comprehensive loss. We do not have significant operations in countries considered highly inflationary.

Interest Rate Risk

We have borrowings under our Credit Agreement that bear interest at a rate per annum equal to either (a) the Eurocurrency rate, with a floor of 0.00%, as adjusted for the reserve percentage required under regulations issued by the Federal Reserve

Board for determining maximum reserve requirements with respect to Eurocurrency funding, plus an applicable margin rate of 3.50% for the term loan and between 4.00% and 3.50% for revolving credit loans, depending on the applicable first lien leverage ratio, or (b) an alternative base rate ("ABR"), with a floor of 1.00%, plus an applicable margin rate of 2.50% for the term loan or between 3.00% and 2.50% for revolving credit loans, depending on the applicable first lien leverage ratio.

The ABR is determined as the greatest of (a) the prime rate, (b) the federal funds effective rate, plus 0.5% or (c) the Eurocurrency rate plus 1.0%. As of December 31, 2021, we had $300.5 million of outstanding borrowings on the term loan, no outstanding borrowings under the revolving credit facility and an outstanding letter of credit of $0.2 million under the Credit Agreement.

Each quarter basis point increase in the Eurocurrency rate would increase interest expense on our current variable rate debt by approximately $0.2 million for the year ended December 31, 2021. Our exposure to interest rate risk is minimized by our interest rate swaps. As of December 31, 2021, we recorded the fair value of our interest rate swaps in the amount of $0.1 million as a derivative asset.

Other Risk

Although we perform services for customers located in a number of jurisdictions, we have not experienced any material difficulties in receiving funds remitted from foreign countries. However, new or modified exchange control restrictions could have an adverse effect on our ability to repatriate cash to fund our operations and make principal and interest payments, when necessary.

Item 8. Financial Statements and Supplementary Data.

Certara, Inc.

Index to Consolidated Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Certara, Inc.

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Certara, Inc. and Subsidiaries (the "Company") as of December 31, 2021 and 2020, and the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of their operations and their cash flows for each of the years in the three-year period ended December 31, 2021, in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) and our report dated March 1, 2022 expressed an adverse opinion on the effectiveness of the Company's internal control over financial reporting.

Change in Accounting Principle

As disclosed in Note 2 to the consolidated financial statements, the Company has changed its method of accounting for leases as of January 1, 2021 due to the adoption of Financial Accounting Standards Board Accounting Standards Codification Topic 842, *Leases.*

Basis for Opinion

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Valuation of intangible assets related to the acquisition of Pinnacle 21, LLC - developed technology, customer relationships and trademarks

As described in Note 5 to the consolidated financial statements, on October 1, 2021, the Company completed the acquisition of Pinnacle 21, LLC ("Pinnacle") which resulted in $143.4 million of intangible assets being recorded. Those intangible assets were comprised of developed technology of $103 million, customer relationships of $24.6 million and trademarks of $15.8 million. Fair values of the developed technology were estimated by management using the multi-period excess earnings method, fair values of the customer relationship intangible assets were estimated using the distributor method and the trademarks intangible assets were estimated using the relief from royalty method. Management's determination of the fair value of the developed technology included significant assumptions related to future expected cash flows from the developed technology, obsolescence factors, contributory asset charges and discount rates. Management's determination of the fair value of the customer relationships acquired included significant assumptions related to revenue growth rates, estimated earnings, customer attrition and discount rates.

Significant judgment is exercised by management when determining the valuation of intangible assets related to the valuation of developed technology, customer relationships and trademark assets, which in turn led to a high degree of auditor judgment, in performing procedures relating to management's significant assumptions related to the revenue growth rates, estimated earnings, contributory asset charges, customer attrition, royalty rates, obsolescence factors, and discount rates. Also, the audit effort involved the use of professionals with valuation skill and knowledge. Given these factors, the related audit effort in evaluating management's judgments in determining the valuation of intangible assets acquired in the Pinnacle acquisition was challenging, subjective, and complex and required a high degree of auditor judgment.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the acquisition accounting, including controls over management's valuation of the developed technology, customer relationships, and trademarks intangible assets. These procedures also included, among others (i) reading the purchase agreement; (ii) evaluating the appropriateness of the multi-period excess earnings, distributor and relief from royalty methods; (iii) evaluating the reasonableness of management's assumptions relating to the revenue growth rates, estimated earnings, contributory asset charges, customer attrition, royalty rates, obsolescence factors, and discount rates used in the methods; and (iv) testing the completeness and accuracy of underlying data used in the methods. Evaluating the assumptions related to the revenue growth rates and estimated earnings involved evaluating whether the assumptions were reasonable considering (i) the current and past performance of the reporting unit; (ii) the consistency with external market and industry data; and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with valuation skill and knowledge were used to assist in the evaluation of the Company's multi-period excess earnings, distributor and relief from royalty methods as well as assumptions related to customer attrition, contributory asset charges, royalty rates, obsolescence factors, and discount rates.

Revenue recognition on the Company's fixed price contract revenue

As described further in Note 2 to the consolidated financial statements, the Company performs professional services under fixed price contracts with the associated revenue recognized over time. For fixed price revenue contracts recognized over time, management utilizes the input method to measure progress toward the complete satisfaction of the performance obligations based upon the hours incurred to date as a percentage of the total estimated hours. We identified revenue recognition for fixed price contracts as a critical audit matter.

The principal consideration for our determination that revenue recognition for fixed price contracts was a critical audit matter is that the measure of progress towards completion utilizes assumptions for future hours to complete the performance obligations, and those assumptions have significant estimation uncertainty. A significant change in the assumptions could affect both the profitability of the contract and the amount of revenue and profit recognized in an accounting period. Also, there is a high volume of contracts and a high degree of judgment when evaluating the contracts.

Given these factors, the related audit effort in evaluating management's judgments in determining the revenue recognition for fixed price contracts was challenging, subjective, and complex and required a high degree of auditor judgment.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to revenue recognition for fixed price contracts, including controls over management's process for recognizing revenue over time. In response to management's assessment of its internal control over financial reporting, a change in our audit plan was required with an increase in audit effort. Our procedures included, among others (i) for a sample of contracts, inquiring regarding the status of the project and obtaining an understanding for significant changes in budgeted to actual hours; (ii) inspecting a sample of contracts to evaluate the existence of an enforceable right to payment for performance completed to date, and evaluating the progress towards completion of contracts based on hours incurred, and testing the appropriateness of the timing and amount of revenue recognized; and (iii) evaluating management's ability to estimate progress towards completion, we selected a sample of fixed price contracts completed during the year, and obtained the internal budget at inception and compared the budgeted hours at inception to the actual hours upon completion. We also selected an additional sample of fixed price contracts completed during the year and compared the hours incurred during the current year to the hours that were estimated to be incurred at completion as of the prior year end. In addition, we confirmed hours incurred per the contract management system directly with a sample of consultants working on the Company's fixed price contracts.

/s/ CohnReznick LLP

We have served as the Company's auditor since 2019.

Tysons, Virginia
March 1, 2022

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Certara, Inc.

Opinion on Internal Control Over Financial Reporting

We have audited Certara, Inc. and Subsidiaries (the "Company") internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, because of the effect of the material weakness, described below, on the achievement of the objectives of the control criteria, the Company has not maintained effective internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control —Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2021 and 2020, the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes (collectively, the consolidated financial statements), and our report dated March 1, 2022 expressed an unqualified opinion on those consolidated financial statements.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the Company's annual or interim financial statements will not be prevented or detected on a timely basis. The following material weakness has been identified and included in management's assessment.

Information technology general controls ("ITGCs") were not designed and implemented over a cloud-based software system that supports the Company's project set-up and time submissions for services provided to the Company's customers. As a result, certain business process automated and manual controls were also considered ineffective because they relied on data and reports accumulated in such software system. These control deficiencies were a result of: information technology processes lacking adequate reviews and documentation to maintain effective controls related to access management, change management and complementary user-organization controls to those implemented at the Service Organization that hosts the software system.

The material weakness was considered in determining the nature, timing and extent of audit tests applied in our audit of the 2021 consolidated financial statements, and this report does not affect our report on those consolidated financial statements.

The Company acquired Pinnacle 21, LLC ("Pinnacle") on October 1, 2021. Management excluded from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2021, Pinnacles' internal control over financial reporting associated with 23% of total assets and 2% of total revenues included in the consolidated financial statements of the Company as of and for the year ended December 31, 2021. Our audit of internal control over financial reporting also excluded an evaluation of the internal control over financial reporting of Pinnacle.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the entity; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with accounting principles generally accepted in the United States of America, and that receipts and expenditures of the entity are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ CohnReznick LLP

Tysons, Virginia
March 1, 2022

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as is defined in the Exchange Act. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements for external reporting purposes in accordance with GAAP and includes those policies and procedures that: (1) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect our transactions and the dispositions of our assets; (2) provide reasonable assurance that our transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP and that our receipts and expenditures are being made only in accordance with appropriate authorizations; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our consolidated financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our management conducted an evaluation, under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our internal control over financial reporting based on the framework in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, our management concluded that our internal control over financial reporting was not effective at December 31, 2021 because of the material weakness described below.

Based on the COSO criteria, management identified control deficiencies that constitute a material weakness. A “material weakness” is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is more than a reasonable possibility that a material misstatement of the Company's annual or interim financial statements will not be prevented or detected on a timely basis. The following material weakness was identified:

Material weakness related to Information Technology General Controls

We concluded that we did not have effective information technology general controls over a cloud-based software system that supports our project set-up and time submissions for services provided to our customers. As a result, certain business process automated and manual controls were also considered ineffective because they relied on data and reports accumulated in such software system. We believe these control deficiencies were a result of our information technology processes lacking adequate reviews and documentation to maintain effective controls related to access management, change management and complementary user-organization controls to those implemented at the Service Organization that hosts the software system.

The material weakness did not result in any identified misstatements. and there were no changes to previously released financial results.

The Company's independent registered public accounting firm, CohnReznick LLP, has issued an adverse opinion on the effectiveness of the Company's internal control over financial reporting as of December 31, 2021, which appears in Item 8. of this Annual Report on Form 10-K.

Management's Plan to Remediate the Material Weakness

Management has outlined a remediation plan and continues to implement measures designed to ensure that control deficiencies contributing to the material weakness are remediated, such that these controls are designed, implemented, and operating effectively. Management remediation actions include:

(i) Implement a controlled process for the onboarding, offboarding, and access rights modifications in the application environment to ensure appropriate provisioning of rights on a least privileged basis; (ii) Document the levels of privileged access roles with specific "allowed" capabilities warranting levels of access for specific roles; (iii) Implement a quarterly log review by business owners to ensure that no privileged account access was provided and removed outside of documented service requests; (iv) Implement a controlled process for application and system level changes in the application environment to ensure appropriate understanding of the changes on financial reporting; and (v) Strengthen ownership and reporting through the IT Governance Process currently in place which will serve as the mechanism to monitor the remediation update.

We believe that these actions will remediate the material weakness. The weakness will not be considered remediated, until the applicable controls operate for a sufficient period of time and management concludes, through testing, that these controls operate effectively. We expect that the remediation of this material weakness will be completed by or before September 30, 2022.

/s/ WILLIAM F. FEEHERY	/s/ M. ANDREW SCHEMICK
William F. Feehery	M. Andrew Schemick
Chief Executive Officer	Chief Financial Officer
March 1, 2022	March 1, 2022

CERTARA, INC. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

(IN THOUSANDS, EXCEPT PER SHARE AND SHARE DATA)	DECEMBER 31, 2021	2020
Assets		
Current assets:		
Cash and cash equivalents	$ 185,797	$ 271,382
Accounts receivable, net of allowance for credit losses of $262 and $132, respectively	69,555	54,091
Restricted cash	827	1,909
Prepaid expenses and other current assets	18,548	19,202
Total current assets	274,727	346,584
Other assets:		
Property and equipment, net	2,935	3,872
Operating lease right-of-use assets	12,634	—
Goodwill	703,371	518,592
Intangible assets, net of accumulated amortization of $169,329 and $127,172, respectively	511,823	396,445
Deferred income taxes	4,073	2,744
Other long-term assets	2,167	1,163
Total assets	$ 1,511,730	$ 1,269,400
Liabilities and stockholder's equity		
Current liabilities:		
Accounts payable	$ 7,458	$ 6,394
Accrued expenses	29,830	30,729
Current portion of deferred revenue	45,496	30,662
Current portion of long-term debt	3,020	4,680
Other current liabilities	6,421	2,880
Total current liabilities	92,225	75,345
Long-term liabilities:		
Deferred revenue, net of current portion	1,531	545
Deferred income taxes	76,098	75,894
Operating lease liabilities, net of current portion	8,256	—
Long-term debt, net of current portion and debt discount	291,746	294,100
Other long-term liabilities	25	1,384
Total liabilities	469,881	447,268
Commitments and contingencies (Note 12)		
Stockholder's equity		
Preferred shares, $0.01 par value, 50,000,000 and no shares authorized as of December 31, 2021 and 2020, respectively, no shares issued and outstanding as of December 31, 2021 and 2020, respectively	—	—
Common shares, 0.01 par value, 600,000,000 shares authorized, 159,658,948 and 152,979,479 shares outstanding at December 31, 2021 and 2020, respectively	1,596	1,529
Additional paid-in capital	1,119,821	884,528
Accumulated deficit	(75,604)	(62,338)
Accumulated other comprehensive loss	(3,926)	(1,587)
Treasury stock at cost, 1,100 and no shares at December 31, 2021 and 2020, respectively	(38)	—
Total stockholder's equity	1,041,849	822,132
Total liabilities and stockholder's equity	$ 1,511,730	$ 1,269,400

The accompanying notes are an integral part of the consolidated financial statements

CERTARA, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS

(IN THOUSANDS, EXCEPT PER SHARE AND SHARE DATA)	YEAR ENDED DECEMBER 31, 2021	2020	2019
Revenues	$ 286,104	$ 243,530	$ 208,511
Cost of revenues	111,616	100,765	79,770
Operating expenses:			
Sales and marketing	20,141	19,202	10,732
Research and development	20,379	19,644	11,633
General and administrative	79,539	88,482	47,926
Intangible asset amortization	38,715	37,414	36,241
Depreciation and amortization expense	2,135	2,443	2,596
Total operating expenses	160,909	167,185	109,128
Income (loss) from operations	13,579	(24,420)	19,613
Other expenses:			
Interest expense	(16,837)	(25,296)	(28,004)
Miscellaneous, net	(117)	(465)	(760)
Total other expenses	(16,954)	(25,761)	(28,764)
Loss before income taxes	(3,375)	(50,181)	(9,151)
Provision for (benefit) from income taxes	9,891	(784)	(225)
Net loss	(13,266)	(49,397)	(8,926)
Other comprehensive income (loss)			
Foreign currency translation adjustment, net of tax of $195, $(227), $267	(5,154)	5,045	433
Change in fair value of interest rate swap, net of tax of $(16), $(384), $(520)	547	(1,135)	(4,283)
Reclassification of fair value of interest rate swap, net of tax of $(765), $0, $0	2,268	—	—
Total other comprehensive income (loss)	(2,339)	3,910	(3,850)
Comprehensive loss	$ (15,605)	$ (45,487)	$ (12,776)
Net loss per common shares — basic and diluted	$ (0.09)	$ (0.37)	$ (0.07)
Basic and diluted weighted average common shares outstanding	149,842,668	133,247,212	132,407,786

The accompanying notes are an integral part of the consolidated financial statements

CERTARA, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(IN THOUSANDS, EXCEPT SHARE DATA)	COMMON STOCK SHARES	COMMON STOCK AMOUNT	ADDITIONAL PAID-IN CAPITAL	ACCUMULATED DEFICIT	ACCUMULATED OTHER COMPREHENSIVE LOSS	Treasury Stock	TOTAL STOCKHOLDER'S EQUITY
Balance as of December 31, 2018	132,407,786	$ 1,324	$ 507,524	$ (14,432)	$ (1,647)	$ —	$ 492,769
Cumulative effect adjustment upon adoption of Topic 606	—	—	—	10,417	—	—	10,417
Equity compensation	—	—	1,691	—	—	—	1,691
Repurchase of Parent Class B units	—	—	(703)	—	—	—	(703)
Capital contribution	—	—	650	—	—	—	650
Change in fair value of interest rate swap, net of tax	—	—	—	—	(4,283)	—	(4,283)
Net loss	—	—	—	(8,926)	—	—	(8,926)
Foreign currency translation adjustment, net of tax	—	—	—	—	433	—	433
Balance as of December 31, 2019	132,407,786	1,324	509,162	(12,941)	(5,497)	—	492,048
Equity-based compensation awards	5,941,693	59	64,448	—	—	—	64,507
Repurchase of Parent Class B units	—	—	(1,079)	—	—	—	(1,079)
Capital contribution	—	—	250	—	—	—	250
Issuance of common stock upon initial public offering, net	14,630,000	146	311,747	—		—	311,893
Change in fair value of interest rate swap, net of tax	—	—	—	—	(1,135)	—	(1,135)
Net loss	—	—	—	(49,397)	—	—	(49,397)
Foreign currency translation adjustment, net of tax	—	—	—	—	5,045	—	5,045
Balance as of December 31, 2020	152,979,479	1,529	884,528	(62,338)	(1,587)	—	822,132
Equity-based compensation awards	(59,148)	—	29,483	—	—	—	29,483
Restricted stock units withheld for tax liability	—	—	(234)	—	—	—	(234)
Issuance common stock from public offerings, net	4,500,000	45	133,306	—	—	—	133,351
Common shares issued in connection with Pinnacle acquisition	2,239,717	22	72,738	—	—	—	72,760
Restricted stock withheld for tax liability and in treasury	(1,100)	—	—	—	—	(38)	(38)
Change in fair value from interest rate swap, net of tax	—	—	—	—	547	—	547
Reclassification of fair value of interest rate swap, net of tax	—	—	—	—	2,268	—	2,268
Net loss	—	—	—	(13,266)	—	—	(13,266)
Foreign currency translation adjustment, net of tax	—	—	—	—	(5,154)	—	(5,154)
Balance as of December 31, 2021	159,658,948	$ 1,596	$ 1,119,821	$ (75,604)	$ (3,926)	$ (38)	$ 1,041,849

The accompanying notes are an integral part of the consolidated financial statements

CERTARA, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

(IN THOUSANDS)	YEAR ENDED DECEMBER 31, 2021	2020	2019
Cash flows from operating activities:			
Net loss	$ (13,266)	$ (49,397)	$ (8,926)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Depreciation and amortization of property and equipment	2,135	2,443	2,596
Amortization of intangible assets	42,980	40,310	38,964
Amortization of debt issuance costs	1,531	1,520	1,536
(Recovery of) provision for credit losses	130	(53)	10
Loss on retirement of assets	351	19	113
Equity-based compensation expense	29,483	64,507	1,691
Unrealized loss on derivative	1,144	—	—
Deferred income taxes	(1,184)	(7,825)	(6,703)
Changes in assets and liabilities, net of acquisitions:			
Accounts receivable	(10,066)	(3,932)	(1,521)
Prepaid expenses and other assets	585	(8,257)	(1,831)
Accounts payable and accrued expenses	1,130	2,381	10,031
Deferred revenue	5,435	3,094	2,065
Net cash provided by operating activities	60,388	44,810	38,025
Cash flows from investing activities:			
Capital expenditures	(1,143)	(863)	(2,107)
Capitalized development costs	(7,759)	(7,074)	(7,410)
Business acquisitions, net of cash acquired	(261,020)	(675)	—
Net cash used in investing activities	(269,922)	(8,612)	(9,517)
Cash flows from financing activities:			
Capital contributions	—	250	650
Unit repurchase	—	(1,079)	(703)
Proceeds from issuance of common stock, net of underwriters' discounts and commissions	133,351	316,301	—
Proceeds from borrowings on long-term debt	89	—	—
Payments on long-term debt and finance lease obligations	(3,973)	(104,358)	(3,436)
Proceeds from line of credit	—	19,880	—
Payments on financing component of interest rate swap	(1,095)	—	—
Payments on line of credit	—	(19,880)	(5,000)
Payment of deferred offering costs	(1,767)	(2,900)	—
Payment of debt issuance costs	(2,942)	—	—
Payment of taxes on shares and units withheld for employee taxes	(272)	—	—
Net cash provided by (used in) financing activities	123,391	208,214	(8,489)
Effect of foreign exchange rate changes on cash, cash equivalents, and restricted cash	(524)	(883)	(2,444)
Net (decrease) increase in cash, cash equivalents, and restricted cash	(86,667)	243,529	17,575
Cash, cash equivalents, and restricted cash, at beginning of period	273,291	29,762	12,187
Cash, cash equivalents, and restricted cash, at end of period	$ 186,624	$ 273,291	$ 29,762
Supplemental disclosures of cash flow information			
Cash paid for interest	$ 14,169	$ 27,607	$ 26,428
Cash paid for taxes	$ 8,595	$ 12,278	$ 4,109
Supplemental schedule of noncash investing and financing activities			
Property and equipment controlled through capital lease obligations	$ —	$ 831	$ —
Deferred offering costs, accrued but not paid	$ —	$ 1,767	$ —
Operating right-of-use assets recognized upon adoption of ASC 842	$ 15,857	$ —	$ —
Operating lease liability recognized upon adoption of ASC 842	$ 16,809	$ —	$ —
Common shares issued in connections with the Pinnacle acquisition	$ 72,760	$ —	$ —

The accompanying notes are an integral part of the consolidated financial statements

CERTARA, INC. AND SUBSIDIARIES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(IN THOUSANDS, EXCEPT PER SHARE PERCENTAGES AND SHARE AND UNIT DATA)

1. Description of Business

Certara, Inc. and its wholly-owned subsidiaries (together, the "Company") deliver software products and technology-driven services to customers to efficiently carry out and realize the full benefits of biosimulation in drug discovery, preclinical and clinical research, regulatory submissions and market access. The Company is a global leader in biosimulation, and the Company's biosimulation software and technology-driven services help optimize, streamline, or even waive certain clinical trials to accelerate programs, reduce costs, and increase the probability of success. The Company's regulatory science and market access software and services are underpinned by technologies such as regulatory submissions software, natural language processing, and Bayesian analytics. When combined, these solutions allow the Company to offer customers end-to-end support across the entire product life cycle. On October 1, 2020, the Company amended the certificate of incorporation of EQT Avatar Topco, Inc. to change the name of the Company to Certara, Inc.

The Company has operations in the United States, Canada, Spain, Luxembourg, Portugal, United Kingdom, Germany, France, Netherlands, Denmark, Switzerland, Italy, Poland, Japan, Philippines, India, Australia and China.

2. Summary of Significant Accounting Policies

(a) Basis of Presentation and Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. generally accepted accounting principles ("GAAP") requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Significant estimates include, among other estimates, assumptions used in the allocation of the transaction price to separate performance obligations, estimates towards the measure of progress of completion on fixed-price service contracts, the determination of fair values and useful lives of long-lived assets as well as intangible assets, goodwill, allowance for credit losses for accounts receivable, recoverability of deferred tax assets, recognition of deferred revenue, value of interest rate swaps, determination of fair value of equity-based awards and assumptions used in testing for impairment of long-lived assets. Actual results could differ from those estimates, and such differences may be material to the consolidated financial statements.

(b) Recently Adopted Accounting Pronouncements

In October 2021, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2021-08, "Business Combinations (Topic 805) - Accounting for Contract Assets and Contract Liabilities from Contracts with Customers", which requires that at the acquisition date, an acquirer should account for the related revenue contracts in accordance with ASC Topic 606, "Revenue from Contracts with Customers" ("Topic 606"), as if it had originated the contracts. Generally, this results in an acquirer recognizing and measuring the acquired contract assets and contract liabilities consistent with how they were recognized and measured in the acquiree's financial statements if the acquiree prepared financial statements in accordance with U. S. GAAP. For public business entities, the ASU is effective for fiscal years beginning after December 15, 2022, including interim periods within those fiscal years. Early adoption of the ASU is permitted. The Company early adopted ASU 2021-08 early and has carried over the contract assets and liabilities from the 2021 business acquisitions into the Company's 2021 consolidated financial statements.

In December 2019, the FASB issued ASU 2019-12, "Simplifying the Accounting for Income Taxes" which removes certain exceptions related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and the recognition of deferred tax liabilities for outside basis differences. The Company adopted this guidance on January 1, 2021 on a prospective basis. The adoption of this guidance did not have an impact on the Company's consolidated financial statements.

In January 2017, the FASB issued ASU No. 2017-04, “Intangibles—Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment”, which simplifies the subsequent measurement of goodwill and eliminated Step 2 test from goodwill impairment test. Step 2 required an entity to perform procedures that determine the fair value of its reporting units at the impairment testing date of its assets and liabilities following the procedure that would be required in determining the fair value of assets acquired and liabilities assumed in a business combination. Under the new guidance, an entity should perform its annual, or interim, goodwill impairment test by comparing the fair value of a reporting unit with it carrying amount. The Company adopted the standard as of December 31, 2021. The adoption of this guidance did not have a material impact on the Company's consolidated financial statements.

In June 2016, the FASB issued ASU No. 2016-13, “Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments”, which amended the existing accounting standard for the measurement of credit losses. The new standard primarily requires using the current expected credit losses approach to measure and recognize credit losses of financial assets held at amortization cost. It replaces the existing incurred loss model with an expected loss model and requires using historical data and adjusting for current economic conditions, including reasonable and supportable forecasts to estimate credit losses to be expected. The Company adopted the standard as of December 31, 2021. The adoption of this guidance did not have a material impact on the Company's consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, “Leases (Topic 842)”, which supersedes FASB Topic 840, “Leases (Topic 840)” and requires lessees to recognize most leases on the balance sheet with a corresponding right of use asset. Leases will be classified as financing or operating which will drive the expense recognition pattern. For lessees, the income statement presentation and expense recognition pattern for financing and operating leases is similar to the current model for capital and operating leases, respectively. Companies may elect to exclude short-term leases. The update also requires additional disclosures that will better enable users of financial statements to assess the amount, timing, and uncertainty of cash flows arising from leases. The Company adopted the new standard as of January 1, 2021, due to its loss of emerging growth company (“EGC”) status, using the effective date transition method. As permitted under the effective date transition method, financial information and disclosure for periods prior to the date of initial application was not updated. An adjustment to opening accumulated deficit was not required in conjunction with the Company’s adoption. The Company has elected not to reassess whether expired or existing contracts contain leases, nor did the Company reassess the classification of existing leases as of the adoption date. The Company did not use hindsight in the assessment of lease terms as of the effective date. For additional information, see Note 14 - Leases.

(c) Recently Issued Accounting Pronouncements

In November 2021, the FASB issued ASU 2021-10, “Government Assistance (Topic 832): Disclosures by Business Entities about Government Assistance”. The ASU requires that entities increase disclosures about government assistance received relating to accounting policy, nature of the assistance, and the effect of the assistance on the financial statements. The ASU is effective for annual periods beginning after December 15, 2021. Early application of the ASU is permitted. The Company is currently evaluating the impact of these amendments on its consolidated financial statements.

(d) Principles of Consolidation

The accompanying consolidated financial statements include the accounts of the Company and its wholly owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

(e) Fair Value Measurements

The Company follows FASB ASC 820-10, “Fair Value Measurements” (“ASC 820-10”), which defines fair value, establishes a framework for measuring fair value in U.S. GAAP, and requires certain disclosures about fair value measurements.

ASC 820-10 defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the most advantageous market for the asset or liability in an orderly transaction. Fair value measurement is based on a hierarchy of observable or unobservable inputs. The standard describes three levels of inputs that may be used to measure fair value.

Level 1 — Inputs to the valuation methodology are quoted prices available in active markets for identical securities as of the reporting date;

Level 2 — Inputs to the valuation methodology are other significant observable inputs, including quoted prices for similar securities, interest rates, credit risk etc. as of the reporting date, and the fair value can be determined through the use of models or other valuation methodologies; and

Level 3 — Inputs to the valuation methodology are unobservable inputs in situations where there is little, or no market activity of the securities and the reporting entity makes estimates and assumptions relating to the pricing of the securities including assumptions regarding risk.

If the inputs used to measure fair value fall in different levels of the fair value hierarchy, the hierarchy is based upon the lowest level of input that is significant to the fair value measurement. For the acquisitions noted in Note 5, the fair value measurement methods used to estimate the fair value of the assets acquired and liabilities assumed at the acquisition dates utilized a number of significant unobservable inputs of Level 3 assumptions. These assumptions included, among other things, projections of future operating results, implied fair value of assets using an income approach by preparing a discounted cash flow analysis, and other subjective assumptions.

Interest rate swaps are valued in the market using discounted cash flows techniques. These techniques incorporate Level 1 and Level 2 inputs. The market inputs are utilized in the discounted cash flows' calculation considering the instrument's term, notional amount, discount rate and credit risk. Significant inputs to the derivative instrument valuation model for interest rate swaps are observable in active markets and are classified as Level 2 in the hierarchy.

(f) Cash and Cash Equivalents and Restricted Cash

Cash equivalents include highly-liquid investments with maturities of three months or less from the date purchased. At times, cash balances held at financial institutions were in excess of the Federal Deposit Insurance Corporation's ("FDIC") insured limits; however, the Company primarily places its temporary cash with high-credit quality financial institutions. The Company has never experienced losses related to these balances and believes it is not exposed to any significant credit risk on cash.

Restricted cash represents cash that is reserved to support a financing program and unexpended restricted grant funds. The restricted cash balance was $827 and $1,909 at December 31, 2021 and 2020, respectively.

As of December 31, 2021 and 2020, the carrying values reflected in the Consolidated Balance Sheets reasonably approximate the fair values of cash and cash equivalents and restricted cash due to the short-term maturity of these items. The following table provides a reconciliation of cash and cash equivalents and restricted cash reported within the consolidated balance sheets to the amounts presented in the consolidated statements of cash flows:

	DECEMBER 31,		
	2021	2020	2019
Cash and cash equivalents	$ 185,797	$ 271,382	$ 29,256
Restricted cash, current	827	1,909	506
Total cash and cash equivalents, and restricted cash	$ 186,624	$ 273,291	$ 29,762

(g) Accounts Receivable

Accounts receivable includes current outstanding invoices billed to customers. Invoices are typically issued with net 30-days to net 90-days terms upon delivery of product or upon achievement of billable events for service-based contracts.

Unbilled receivables relate to the Company's rights to consideration for performance obligations satisfied but not billed at the reporting date on contracts. Unbilled receivables are billed and transferred to customer accounts receivable when the rights become unconditional. The carrying amount of accounts receivable is reduced by a valuation allowance.

The Company estimates the expected credit losses for trade receivables using historical loss data adjusted for current economic conditions, including reasonable and supportable forecasts to estimate relative size of credit losses to be expected under the CECL model. The Company generally writes off a receivable or records a specific allowance for credit losses if the Company determines that the receivable is not collectible. Allowances for credit losses of $262 and $132 were provided in the accompanying consolidated financial statements as of December 31, 2021 and 2020, respectively.

	DECEMBER 31,	
	2021	2020
Trade receivables	$ 60,167	$ 46,395
Unbilled receivables	9,071	7,698
Other receivables	579	130
Allowances for credit losses	(262)	(132)
Accounts receivable, net	$ 69,555	$ 54,091

The following is the allowance rollforward of credit losses for the Company's accounts receivable as of December 31, 2021 and 2020.

	DECEMBER 31,	
	2021	2020
Beginning balance	$ 132	$ 185
Provision for credit losses	215	23
Charge-offs	(85)	(89)
Recoveries	—	13
Ending Balance	$ 262	$ 132

(h) Property and Equipment

Property and equipment are stated at cost, less accumulated depreciation and amortization.

Depreciation and amortization is provided using the straight-line method over the estimated useful lives of the assets, which range from three to ten years for equipment and furniture, the shorter of the useful lives of the improvement or the life of the related lease term for leasehold improvements, and one to three years for purchased software. The Company seeks to match the book useful life of assets to the expected productive lives. Assets deemed to be impaired or no longer productive are written down to their net realizable value. The Company reviews long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying value of the asset may not be recoverable. If such events or changes in circumstances are present, an impairment loss would be recognized if the sum of the expected future net cash flows is less than the carrying amount of the asset. An impairment loss would be recorded for the excess of the carrying value of the asset over the estimated fair value. There was no impairment of property and equipment for the years ended December 31, 2021, 2020, and 2019.

(i) Leases

The Company determines if a contract contains a lease at contract inception and whether its classification as either an operating or finance lease at lease commencement. The Company's current portfolio includes operating leases of real estate and capital leases of equipment. The Company records a lease liability, as of the lease commencement date, in an amount equal to the present value of future fixed payments over the lease term. Options to extend or terminate a lease are considered in the lease term to the extent that the option is reasonably certain of exercise. A right-of-use ("ROU") asset is recorded in an amount equal to the corresponding lease liability adjusted for prepayments, initial directs costs and lease incentives, if applicable. The Company has elected not to recognize ROU assets and lease liabilities for short-term leases of real estate with a lease term of 12 months or less.

The Company generally uses its incremental borrowing rate in determining the present value of future payments as the rate implicit in the lease is unknown. The incremental borrowing rate represents the rate of interest that the Company would expect to pay on a collateralized basis to borrow an amount equal to the lease payments under similar terms.

Fixed lease payments on operating leases are recognized on a straight-line basis over the lease term, while variable payments are recognized in the period incurred. Variable lease payments include real estate taxes and charges for other non-lease services due to lessors that are not dependent on an index or rate. The Company's real estate contracts may include fixed consideration attributable to both lease and non-lease components, including non-lease services provided by the lessor, which are accounted for as a single fixed minimum payment. ROU assets under finance leases are depreciated in a manner similar to other property and equipment.

(j) Software Development Costs

Software development costs are accounted for in accordance with FASB ASC Subtopic 985-20 if the software is to be sold, leased or otherwise marketed, or by FASB ASC Subtopic 350-40 if the software is for internal use. After the technological feasibility of the software has been established (for software to be marketed), or at the beginning of application development (for internal-use software), software development costs, which include primarily salaries and related payroll costs and costs of independent contractors incurred during development, are capitalized. Research and development ("R&D") costs incurred prior to the establishment of technological feasibility (for software to be marketed), or prior to application development (for internal-use software), are expensed as incurred. Software development costs are amortized on a product-by-product basis commencing on the date of general release of the products (for software to be marketed) or the date placed in service (for internal-use software). During the years ended December 31, 2021, 2020 and 2019, costs of $7,759, $7,074, and $7,410, respectively, were capitalized related to software development activities. Software development costs for software to be marketed are amortized using the straight-line method over its estimated useful life, which is typically three years. The Company reviews capitalized software for impairment whenever events or changes in circumstances indicate that the carrying value of the asset may not be recoverable. If such events or changes in circumstances are present, an impairment loss would be recognized if the sum of the expected future net cash flows is less than the carrying amount of the asset. An impairment loss would be recorded for the excess of the carrying value of the asset over the estimated fair value. There was no impairment of software development costs for the years ended December 31, 2021, 2020, and 2019.

(k) Debt Issuance Costs

Debt issuance costs are capitalized and amortized over the term of the related debt using the effective interest rate method. Amortization of debt issuance costs is included in interest expense within the Consolidated Statements of Operations and Comprehensive Loss. The unamortized amount is included as an offset against long-term debt on the Consolidated Balance Sheets. Debt issuance costs related to line-of-credit arrangements are capitalized and are included in other long-term assets on the Consolidated Balance Sheets. The capitalized costs are amortized ratably over the term of the line-of-credit arrangement. The amortization costs are included in interest expense within the Consolidated Statements of Operations and Comprehensive Loss, regardless of whether there are any outstanding borrowings on the line-of-credit arrangement.

(l) Goodwill and Other Intangible Assets

The Company has four reporting units – Software reporting unit ("Software"), SimCyp reporting unit ("SimCyp"), Integrated Drug Development reporting unit ("IDD"), and Regulatory Writing reporting unit ("Regulatory Writing") which are within a single operating segment of the Company. Goodwill is tested for impairment at the reporting unit level, which is one level below or the same as an operating segment. When testing goodwill for impairment, the Company performs a qualitative assessment to determine whether events or circumstances lead to a determination that it is more-likely-than-not that the fair values of the reporting units are less than their carrying amounts. If the Company determines that it is not more-likely-than-not that the fair values of the reporting units are less than their carrying values, no further assessment is performed. If the Company determines that it is more-likely-than-not that the fair values of the report units are less than carrying value, the Company proceed to perform a quantitative goodwill impairment test. If the result of the quantitative test show that carrying amount of reporting unit exceeds its fair values, an impairment loss is recognized in an amount equal to that excess, limited to the total amount of goodwill allocated to that reporting unit.

For the years ended December 31, 2021, 2020, and 2019, the Company performed quantitative assessments of goodwill. The most recent assessment was performed on October 1, 2021. The quantitative assessments resulted in no impairment as the estimated fair value of each reporting unit significantly exceeded its carrying value. Accordingly, no impairment loss was recorded for the years ended December 31, 2021, 2020, and 2019.

Other identifiable intangible assets with finite lives, such as software products acquired in acquisitions, non-compete agreements, tradenames and customer relationship assets, are amortized over their estimated lives using either a straight-line method or a method based on pattern of expected economic benefit of the asset as follows: acquired software — 3 to 14 years; non-compete agreements — 2 to 5 years; tradenames — 20 years; customer relationships — 11 to 16 years; and trademarks — 10 to 17 years. The Company evaluates finite intangible assets for impairment whenever events or changes in circumstances indicate that the carrying amount of the asset might not be recoverable. An impairment loss is recognized when estimated undiscounted future cash flows expected to result from the use of the asset are less than its carrying amount.

There were no impairment charges related to intangible assets for the years ended December 31, 2021, 2020, and 2019.

(m) Foreign Currency Translation

Generally, the functional currency of the Company's international subsidiaries is the local currency of the country in which they operate. The Company translates the assets and liabilities of its non-U.S. dollar functional currency subsidiaries into U.S. dollars using exchange rates in effect at the end of each reporting period. Revenue and expenses for these subsidiaries are translated using average exchange rates prevailing during the period. Gains and losses from these translations are recognized as a cumulative translation adjustment and included as a separate component in accumulated other comprehensive loss within stockholders' equity.

For transactions that are not denominated in the local functional currency, the Company remeasures monetary assets and liabilities at exchange rates in effect at the end of each reporting period. Foreign currency transaction gains and losses are included net within comprehensive gain or loss in the Consolidated Statements of Operations and Comprehensive Loss and resulted in foreign currency gain (losses) of $175, $(715), and $(431) for the years ended December 31, 2021, 2020, and 2019, respectively.

(n) Derivative Instruments

In the normal course of business, the Company is subject to risk from adverse fluctuations in interest rates. The Company has chosen to manage this risk through the use of derivative financial instruments that consist of interest rate swap contracts. Counterparties to these contracts are major financial institutions. The Company is exposed to credit loss in the event of nonperformance by these counterparties. The Company does not use derivative instruments for trading or speculative purposes. The objective in managing exposure to market risk is to limit the impact on cash flows. To qualify for hedge accounting, the interest rate swaps must effectively reduce the risk exposure that they are designed to hedge. In

addition, at inception of a qualifying cash flow hedging relationship, the underlying transaction or transactions must be, and be expected to remain, probable of occurring in accordance with the related assertions.

FASB ASC 815, “Derivatives and Hedging,” requires the Company to recognize all derivatives on the balance sheet at fair value. The Company may enter into derivative contracts such as interest rate swap contracts that effectively convert portions of the Company’s floating rate debt to a fixed rate, which serves to mitigate interest rate risk. The Company’s objectives in using interest rate swaps are to add stability to interest expense and to manage its exposure to interest rate movements. Interest rate swaps designated as cash flow hedges involve the receipt of variable-rate amounts from a counterparty in exchange for the Company making fixed-rate payments over the life of the agreements without exchange of the underlying notional amount.

The Company has an interest rate swap agreement that was designated as a cash flow hedge of interest rate risk for a notional amount of $230,000 that fixed the interest rate at 2.1284%, non-inclusive of the fixed credit spread through May 31, 2022. In the second quarter of 2021, the Company determined that the hedge had not been highly effective from April 2018 and did not qualify for hedge accounting. As a result, the Company performed an analysis of the materiality of the out of period error correction in accordance with ASC 250, “Accounting Changes and Error Corrections”, both quantitively and qualitatively, and concluded that the error correction was immaterial to all periods. The Company reclassified $3,033 of accumulated comprehensive loss to interest expense in the Consolidated Statements of Operations and Comprehensive Loss in the second quarter of 2021. Changes in the fair value of the interest rate swap recognized in interest expense excluding the reclassification discussed previously for the year ended December 31, 2021 amounted to $638.

On August 31, 2021, the Company entered an amendment to the interest rate swap agreement. The amended interest rate swap agreement does not in its entirety meet the definition of a derivative instrument because of its off market fixed rate at inception and is deemed to be a hybrid instrument with a financing component and an embedded at-the-market derivative. Such embedded derivative is bifurcated and accounted for separately. At inception, the financing component of $1,966 was recorded as the amortized cost. The embedded at-the-market derivative was designated and qualified as a cash flow hedge of interest rate risk for a notional amount of $230,000 that fixed the interest rate at 1.2757%, non-inclusive of the fixed credit spread through May 31, 2022. The fair value of the embedded at-the-market derivative is recognized in the Consolidated Balance Sheets and the changes in the fair value of the embedded at-the-market derivative is recognized in other comprehensive income(loss). At December 31, 2021, the financing component is recorded as current portion of interest rate swap liability in the amount of $1,088 and is included in other current liabilities on the Consolidated Balance Sheet. Due to an other-than-insignificant financing element on a portion of such hybrid instrument, the cash flows associated with this hybrid instrument are classified as financing activities in the Consolidated Statements of Cash Flows. At December 31, 2021, the Company recorded the fair value of the embedded at-the-market derivative as current portion of interest rate swap assets in the amount of $57 in prepaid expenses and other current assets on the Consolidated Balance Sheet.

The following table sets forth the liabilities that were measured at fair value on a recurring and non-recurring basis by their levels in the fair value hierarchy at December 31, 2021:

	LEVEL 1	LEVEL 2	LEVEL 3	TOTAL
Asset				
Interest rate swap asset	$ —	$ 57	$ —	$ 57
Total	$ —	$ 57	$ —	$ 57

The following table sets forth the liabilities that were measured at fair value on a recurring and non-recurring basis by their levels in the fair value hierarchy at December 31, 2020:

	LEVEL 1	LEVEL 2	LEVEL 3	TOTAL
Liability				
Interest rate swap liability	$ —	$ 3,671	$ —	$ 3,671
Total	$ —	$ 3,671	$ —	$ 3,671

The net amount of deferred gains (losses) related to derivative instruments designated as cash flow hedges that is expected to be reclassified from accumulated other comprehensive loss into interest expense over the next 12 months is insignificant.

(o) Warranty

The Company includes an assurance commitment warranting the application software products will perform in accordance with written user documentation and the agreements negotiated with customers. Since the Company does not customize its applications software, warranty costs are insignificant and expensed as incurred.

(p) Earnings per Share

Basic earnings per common share is computed by dividing the net earnings by the weighted-average number of shares outstanding during the reporting period, without consideration for potentially dilutive securities. Diluted earnings per share is computed by dividing the net earnings attributable to stockholders by the weighted-average number of shares and dilutive securities outstanding during the period.

(q) Income Taxes

The Company accounts for income taxes under the asset and liability method. Under this method, the amount of taxes currently payable or refundable is accrued, and deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the financial reporting and tax basis of existing assets and liabilities. Deferred tax assets also include realizable tax losses and tax credit carryforwards.

The deferred tax assets may be reduced by a valuation allowance, which is established when it is more likely than not that some portion or all of the deferred tax assets will not be realized. In addition, management is required to evaluate all available evidence, both positive and negative, when making its judgment to determine whether to record a valuation allowance for a portion, or all, of its deferred tax assets. Deferred tax assets and liabilities are measured using enacted income tax rates in effect for the year in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in income tax rate is recognized in the period that includes the enactment date.

Uncertainty in Income Taxes

The Company accounts for uncertainty in income taxes using a two-step approach. The first step requires the Company to conclude that a tax position, based solely on its technical merits, is more likely than not to be sustained upon examination by a tax authority. The second step requires the Company to measure the largest amount of benefit, determined on a cumulative probability basis, that is more likely than not to be realized upon ultimate settlement with tax authority. The Company recognizes the effect of income tax positions only if those positions are more likely than not of being sustained. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs. Further, the benefit to be recorded in the consolidated financial statements is the amount most likely to be realized assuming a review by the tax authorities having all relevant information and applying current conventions. The Company's policy is to recognize interest and penalties related to income tax positions taken as a component of the provision for income taxes.

The Company has recorded unrecognized tax benefits of $1,059 and $897 as of December 31, 2021 and 2020, respectively. As of and for the years ended December 31, 2021 and 2020, there were no interest or penalties recorded. The Company does not anticipate any significant changes to its uncertain tax positions during the next 12 months. U.S. federal income tax returns are generally subject to examination for a period of three years after the filing of the return. However, the Internal Revenue Service can audit the NOLs generated in respective years in the years that the NOLs are utilized. State income tax returns are generally subject to examination for a period of three to six years after the filing of the respective tax return. The state impact of any federal changes remains subject to examination by various states for a period of up to one year after formal notification to the states. Foreign income tax returns are generally subject to examination based on the tax laws of the respective jurisdictions.

(r) Revenue Recognition

The Company's revenue consists of fees for perpetual and term licenses for the Company's software products, post-contract customer support (referred to as maintenance), software as a service ("SaaS") and professional services including training and other revenue. Revenue is recognized upon transfer of control of promised products or services to customers in an amount that reflects the consideration to which the Company expects to be entitled in exchange for promised goods or services. The Company typically recognizes license revenue at a point in time upon delivering the applicable license. The revenue related to the support and maintenance performance obligation will be recognized on an over-time basis using time elapsed methodology. The revenue related to software training and software implementation performance will be recognized at the completion of the service.

The following describes the accounting policies for multiple performance obligations and the nature of the Company's primary types of revenues and the revenue recognition policies as they pertain to the types of transactions the Company enters into with its customers.

Arrangements with Multiple Performance Obligations

For contracts with multiple performance obligations, the Company determines if the products or services are distinct and allocates the consideration to each distinct performance obligation on a relative standalone selling price basis. When products and services are not distinct, the Company determines an appropriate measure of progress based on the nature of its overall promise for the single performance obligation. The delivery of a particular type of software and each of the user licenses would be one performance obligation. However, any training, implementation, or support and maintenance promises as part of the software license agreement would be considered separate performance obligations, as those promises are distinct and separately identifiable from the software licenses. The payment terms in these arrangements are sufficiently short such that there is no significant financing component to the transaction.

Software Licenses and Support

License revenue includes perpetual license fees and term license fees, which provide customers with the same functionality and differ mainly in the duration over which the customer benefits from the use of software. Both revenues from perpetual license and term license performance obligations are generally recognized upfront at the point in time when the software license has been delivered.

A source of software license revenue is from term and bundled licenses that are time-based arrangements for one or multiple software products sold together with maintenance and support for the term of the license arrangement. The Company has determined that post customer support and the right to unspecified enhancements and upgrades on a "when-and-if-available" basis included with term licenses is an immaterial component of the transaction price and, therefore, recognized these performance obligation components up front with the license when delivered. Software License contracts do not provide for any non-cash consideration nor is there consideration payable to a customer.

Software Services

For contracts that include multiple performance obligations, such as a software license plus software training, implementation, and/or maintenance/support, or in contracts where there are multiple software licenses, the transaction price is allocated to each of the performance obligations on a pro-rata basis based on the relative standalone selling price ("SSP") of each performance obligation. Maintenance services agreements consist of fees for providing software updates and for providing technical support for software products for a specified term. Revenue allocated to maintenance services is recognized ratably over the contract term beginning on the delivery date of each offering. Maintenance contracts generally have a term of one year. Expenses related to maintenance and subscription are recognized as incurred. While transfer of control of the software training and implementation performance obligations are over time, the services are typically started and completed within a few days. Due to the quick nature of the performance obligation from start to finish and the immaterial amounts, the Company recognizes any software training or implementation revenue at the completion of the service. Any unrecognized portion of amounts paid in advance for licenses and services is recorded as

deferred revenue. Certara's software contracts do not typically include discounts, variable consideration, or options for future purchases that would not be similar to the original goods.

Consortium revenues consist of contractual agreements with customers where the customer receives multiple benefits as part of their contract with the Company, as follows: access to the latest version simulator software, which has at least one new release per year, free access to a preset number of training workshops, a block of consulting hours to be used at the customer's discretion, as well as voting rights at the annual consortium meeting where development priorities for the upcoming year are set. The Company's consortium contracts are generally for three years with annual termination clauses and with annual upfront billings. Consortium revenues are recognized over time as the benefits of the consortium arrangement are realized over the course of the contract. Both the training and consulting services performance obligations will utilize an output method to measure the progress at the end of each reporting period. Revenue from the Company's performance obligation under the simulation license, which provides customers with access to the latest version of the simulation software, is recognized evenly over the contract period.

License revenue and post contract services are combined and reported as software revenue on the Consolidated Statements of Operations and Comprehensive Loss.

Subscription Revenues

Subscription revenues consists of subscription fees for access to, and related support for, our cloud-based solutions. The Company typically invoices subscription fees in advance in annual installments and recognizes subscription revenue ratably over the term of the applicable agreement, usually one to three years which is initially deferred and recognized ratably over the life of the contract. The output method that accurately depicts the transfer of control was determined to be the delivery of accessibility to the customer. Unearned maintenance and subscription revenue are recorded as deferred revenue. The Company's subscription services arrangements are generally non-cancelable and do not contain refund-type provisions. In rare instances that subscription services arrangements are deemed cancelable, the Company will adjust the transaction price and period for revenue recognition accordingly to be reflective of the contract term. The contract transaction price is based on the fixed fee for each subscription.

Services and Other Revenues

The Company's primary services offering includes consulting services, which may be either strategic consulting services, reporting and analysis services, regulatory writing services, or any combination of the three. Strategic consulting services consists of consulting, training, and process redesign that enables customers to identify which uncertainties are greatest and matter most and then to design development programs, trial sequences, and individual trials in such a way that those trials systematically reduce the identified uncertainties in the most rapid and cost-effective manner possible.

The Company's professional services contracts are either time-and-materials, fixed fee or prepaid. Services revenues are generally recognized over time as the services are performed. Generally, these services are delivered to customers electronically. Revenue from time-and-material contracts is recognized on an output basis as labor hours are delivered and/or direct expenses are incurred. Revenues for fixed price services and prepaid are generally recognized over time applying input methods to estimate progress to completion. Accordingly, the number of resources being paid for and varying lengths of time they are being paid for, determine the measure of progress. Training revenues are recognized as the services are performed over time. However, due to short period over which the transfer of control occurs for a classroom or on-site training course, the revenue related to these performance obligations is recognized at the completion of the course for administrative feasibility purposes. The training services generally do not provide for any non-cash consideration nor is there consideration payable to a customer.

At contract inception, the Company assesses the products and services promised in its contracts with customers and identifies a performance obligation for each promise to transfer to the customer a product or service (or bundle of products or services) that is distinct — i.e., if a product or service is separately identifiable from other items in the bundled package and if a customer can benefit from it on its own or with other resources that are readily available to the customer. Determining whether products and services are considered distinct performance obligations that should be accounted for separately versus together may require significant judgment. The Company has contracts with customers that may have

multiple performance obligations, including some or all of the following: software licenses, maintenance, subscriptions, professional services and/or training. For these contracts, the Company accounts for individual performance obligations separately if they are distinct within the context of the contract by allocating the contract's total transaction price to each performance obligation in an amount based on the relative SSP, of each distinct good or service in the contract.

In order to determine the SSP of its promised goods or services, the Company conducts an annual analysis to determine whether its goods or services have an observable SSP. In determining SSP, the Company requires that a substantial majority of the standalone selling prices for goods or services fall within a reasonably narrow pricing range. If the Company does not have a directly observable SSP for a particular good or service, then the Company estimates a SSP by the Company's overall pricing objectives, taking into consideration market factors, pricing practices including historical discounting, historical standalone sales of similar products, customer demographics, geographic locations, and the number and types of users within the Company's contracts. The determination of SSP is made by the Company's management. Selling prices are analyzed at least on an annual basis to identify if the Company has experienced significant changes in its selling prices.

The Company allocates the transaction price to each performance obligation identified in the contract on a relative SSP basis and recognizes revenue when or as it satisfies a performance obligation by transferring control of a product or service to a customer.

Taxes collected from customers and remitted to governmental authorities are not included in revenue. The Company does not incur shipping and handling for its goods as they are generally delivered to a customer electronically.

The Company does not believe that it currently has any rights to return that would result in a material impact to revenues.

Contract Balances

The timing of revenue recognition, billings and cash collections results in billed accounts receivable, unbilled receivables (contract assets), and customer advances and deposits (deferred revenue, contract liabilities) on the Consolidated Balance Sheets. Amounts are billed as work progresses in accordance with agreed-upon contractual terms, either at periodic intervals (e.g., quarterly or monthly) or upon achievement of contractual milestones.

Contract assets relate to the Company's rights to consideration for performance obligations satisfied but not billed at the reporting date on contracts (i.e., unbilled revenue, a component of accounts receivable in the Consolidated Balance Sheets). Contract assets are billed and transferred to customer accounts receivable when the rights become unconditional. The Company typically invoices customers for term licenses, subscriptions, maintenance and support fees in advance with payment due before the start of the subscription term, ranging from one to three years. The Company records the amounts collected in advance of the satisfaction of performance obligations, usually over time, as a contract liability or deferred revenue. Invoiced amounts for non-cancelable services starting in future periods are included in contract assets and deferred revenue. The portion of deferred revenue that will be recognized within 12 months is recorded as current deferred revenue, and the remaining portion is recorded as non-current deferred revenue in the Consolidated Balance Sheets.

The unsatisfied performance obligation as of December 31, 2021 was approximately $91,943.

Deferred Contract Acquisition Costs

Under ASC 606, sales commissions paid to the sales force and the related employer payroll taxes, collectively "deferred contract acquisition costs", are considered incremental and recoverable costs of obtaining a contract with a customer. The Company has determined that sales commissions paid are an immaterial component of obtaining a customer's contract and has elected to expense sales commissions when paid.

Sources and Timing of Revenue

The Company's performance obligations are satisfied either over time or at a point in time. The following table presents the Company's revenue by timing of revenue recognition to understand the risks of timing of transfer of control and cash flows:

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
Software licenses transferred at a point in time	$ 40,167	$ 36,388	$ 35,261
Software licenses transferred over time	46,658	37,075	33,080
Service revenues earned over time	199,279	170,067	140,170
Total	$ 286,104	$ 243,530	$ 208,511

(s) Equity-Based Compensation

The Company measures equity-based compensation at fair value and recognizes the expense over the vesting period. Compensation costs for our legacy Class B Units, issued by EQT, that vested based on continued service requirements and the restricted stock into which they were exchanged are recognized on a straight-line basis over the requisite service period. Compensation costs for our restricted stock units are recognized on a straight-line basis over the requisite service period. Compensation costs for our restricted stock exchanged for our legacy Class B Units with performance vesting conditions are recognized using the accelerated attribution approach. Forfeitures are recognized as they occur for all awards.

(t) Comprehensive Income (Loss)

FASB ASC 220, "Comprehensive Income," establishes standards for reporting of comprehensive income and its components (revenue, gains, and losses) in a full set of general-purpose financial statements. FASB ASC 220 requires that all components of comprehensive income, including net income, be reported in a financial statement that is displayed with the same prominence as other financial statements. Comprehensive income (loss) is defined as the change in equity during a period from transactions and other events and circumstances from non-owner sources. Net income (loss) and other comprehensive income (loss), including foreign currency translation adjustments, and changes in fair value of derivative instruments (interest rate swap agreements) designated as cash flow hedges, shall be reported to arrive at comprehensive (loss). Comprehensive income (loss) is displayed in the Consolidated Statements of Operations and Comprehensive Income (Loss).

The components of other comprehensive income (loss) consisted of foreign currency translation adjustments totaling $(5,154), $5,045 and $433, respectively, and the changes in fair value of interest rate swap (excluding $2,268 reclassification, net of tax), totaling $547, $(1,135), and $(4,283) for the years ended December 31, 2021, 2020, and 2019, respectively.

(u) Reclassification

Certain previously reported amounts in the consolidated financial statements have been reclassified to conform to the current year presentation.

(v) COVID-19

Since the first quarter of 2020, the COVID-19 pandemic has posed a significant threat to public health as well as the global and U.S. economies. The continued spread of variants of COVID-19 may adversely impact our business, financial condition or results of operations as a result of increased costs, negative impacts to our workforce, or a sustained economic downturn. Although the economy has rebounded in many areas, the outlook for containing the outbreak is still highly uncertain. Given its ongoing and dynamic nature, it is difficult to predict the full impact of the COVID-19 outbreak on the global and US economy and our business.

3. Public Offerings

On December 15, 2020, the Company completed its initial public offering (“IPO”), pursuant to which the Company issued and sold 14,630,000 shares of common stock and certain selling stockholders, including former controlling shareholder, EQT, sold 18,783,250 shares of our common stock (representing the full exercise of the underwriters’ option to purchase additional shares), at a public offering price of $23.00 per share. The Company received net proceeds of $316,301, after deducting underwriters' discounts and commissions. In addition, $4,408 of legal, accounting and other offering costs, net of the tax effect of $259, incurred in connection with the sale of the Company's common stock in the IPO, were capitalized and offset against the proceeds received in the IPO.

The Company is party to a registration rights agreement with EQT AB and its affiliates (“EQT AB”), Arsenal, EQT, and certain other stockholders (“Institutional Investors”). The registration rights agreement was amended and restated in connection with the IPO. It contains provisions that entitle EQT AB, Arsenal, EQT, and the other stockholder parties thereto to certain rights to have their securities registered by the Company under the Securities Act. EQT AB will be entitled to an unlimited number of “demand” registrations, subject to certain limitations. Every stockholder that holds registration rights will also be entitled to customary “piggyback” registration rights. In addition, the amended and restated registration rights agreement provides that the Company will pay certain expenses of the stockholder parties relating to such registrations and indemnify them against certain liabilities which may arise under the Securities Act of 1933 (“Securities Act”).

The registration rights agreement will terminate (i) with the prior written consent of the Institutional Investors in connection with a change of control; (ii) for those holders (other than the Institutional Investors) that beneficially own less than 5% of the Company’s outstanding shares, if all of the Registrable Securities then owned by such holder could be sold in any 90-day period pursuant to Rule 144; (iii) as to any holder, if all of the Registrable Securities held by such holder have been sold or otherwise transferred in a Registration pursuant to the Securities Act or pursuant to an exemption therefrom; or (iv) with respect to any holder that is an officer, director, employee or consultant of the Company on the date that is 90 days after the date on which such holder ceases to be an employee, director or consultant (as applicable) of the Company. The rights and obligations do not transfer without the written consent of the Company and the Institutional Investors.

On March 29, 2021, the Company completed an underwritten secondary public offering in which certain selling stockholders, including EQT, sold 11,500,000 shares of the Company’s common stock, including 1,500,000 shares of common stock pursuant to the full exercise of the underwriters’ option to purchase additional shares. The Company did not offer any common stock in this transaction and did not receive any proceeds from the sale of the shares of common stock by the selling stockholders. The Company incurred costs of $1,100, recorded in general and administrative expenses, in relation to the secondary public offering.

On September 13, 2021, the Company completed another public offering, at a price of $31.00 per share, pursuant to which the Company sold 4,500,000 shares of its common stock, and certain selling stockholders sold 18,500,000 shares of the Company’s common stock, including 3,000,000 shares of common stock pursuant to the full exercise of the underwriters’ option to purchase additional shares. The Company received net proceeds of $134,096, after deducting underwriters' discounts and commissions. In addition, $745 of legal, accounting and other offering costs incurred in connection with the sale of the Company's common stock in the public offering were capitalized and offset against the proceeds received.

On November 22, 2021, the Company completed another secondary public offering in which certain selling stockholders, including EQT, sold 10,000,000 shares of the Company’s common stock. The Company did not offer any common stock in this transaction and did not receive any proceeds from the sale of the shares of common stock by the selling stockholders. The Company incurred costs of $644, recorded in general and administrative expenses, in relation to the secondary public offering.

4. Concentrations of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk have consisted principally of cash and cash equivalent investments and trade receivables. The Company invests available cash in bank deposits, investment-grade securities, and short-term interest-producing investments, including government obligations and other money market instruments. At December 31, 2021 and 2020, the investments were bank deposits and overnight sweep accounts. The Company has adopted credit policies and standards to evaluate the risk associated with sales that require collateral, such as letters of credit or bank guarantees, whenever deemed necessary. Management believes that any risk of loss is significantly reduced due to the nature of the customers and distributors with which the Company does business.

As of December 31, 2021and 2020, no customer accounted for more than 10% of the Company's accounts receivable. For the years ended December 31, 2021, 2020, and 2019, no customer accounted for more than 10% of the Company's revenues.

5. Business Combinations

Acquisitions have been accounted for using the acquisition method of accounting pursuant to FASB ASC 805, "Business Combinations." Amounts allocated to the purchased assets and liabilities are based upon the total purchase price and the estimated fair values of such assets and liabilities on the effective date of the purchase as determined by an independent third party. The results of operations have been included in the Company's results of operations prospectively from the date of acquisition.

Author! B.V.

On March 2, 2021, the Company completed a transaction which qualified as a business combination for a total consideration of $2,667. The business combination was not material to our consolidated financial statements. Based on the Company's purchase price allocation, approximately $1,200, $100 and $1,200 of the purchase price was assigned to customer relationships, non-compete agreements and goodwill, respectively.

Insight Medical Writing Limited

On June 7, 2021, the Company completed a transaction which qualified as a business combination for a total consideration of $15,197. The business combination was not material to our consolidated financial statements. Based on the Company's purchase price allocation, approximately $7,400 and $4,700 of the purchase price was assigned to customer relationships and goodwill, respectively.

Pinnacle 21, LLC

On October 1, 2021, the Company acquired 100% of the equity of Pinnacle. Pinnacle provides software and services for preparing clinical trial data for regulatory submission. The acquisition executes on the Company's strategy to invest in innovation to increase the use cases of biosimulation and grow adoption of Certara's end-to-end platform.

The acquisition of Pinnacle was treated as a purchase in accordance with ASC 805, "Business Combinations", which requires allocation of the purchase price to the estimated fair values of assets and liabilities acquired in the transaction.

The following table summarizes the fair value of the consideration paid as well as the fair values of the assets acquired and liabilities assumed as of the date of the acquisition:

Fair value of consideration:	Pinnacle
Cash paid to sellers	$ 249,115
Cash paid to others and escrow	17,200
Unregistered shares of Certara, Inc. (2,239,717 shares)	72,760
Total consideration	$ 339,075
Assets acquired and liabilities assumed:	
Cash and cash equivalents	$ 19,409
Accounts receivable	2,925
Other current assets	619
Property and equipment	258
Deferred tax assets	2,907
Identifiable intangible assets:	
Trademark	15,800
Acquired software	103,000
Customer relationships	24,600
Goodwill	180,947
Long-term deposits	34
Current liabilities	(794)
Current portion of deferred revenue	(10,630)
Net assets acquired	$ 339,075

The fair value of the unregistered shares given as part of the purchase consideration was determined based on the market price of Certara stock on the closing date less a 7% discount for lack of marketability.

The acquisition was structured as an asset acquisition for income tax purposes; therefore, the Company’s tax basis in Pinnacle’s identifiable assets reflects the fair value of consideration paid. However, the company did not recognize tax basis in certain liabilities assumed at the acquisition date; resulting in deferred income taxes being recorded in purchase accounting.

The fair value of the intangible assets is based on significant inputs that are not observable in the market and, therefore, represent Level 3 measurements within the fair value measurement hierarchy. The fair value of the customer relationships (Distributor method), trademarks (Relief from Royalty method) and developed technology (Multi-Period Excess Earnings Method) was determined under the income approach.

Goodwill of $180,947 was recorded to reflect the excess of the purchase price over the estimated fair value of the net identifiable assets acquired, which is generally deductible for income tax purposes. The excess of the purchase prices over the fair values of the acquired business's net assets represent cost and revenue synergies specific to the Company, as well as non-capitalizable intangible assets, such as the employee workforces acquired, and has been allocated to goodwill.

The current purchase price allocation is preliminary. The primary areas of the preliminary purchase price allocations that are not yet finalized relate to the fair value of certain tangible and intangible assets acquired and liabilities assumed, and residual goodwill. The Company expects to continue to obtain information to assist in determining the fair values of the net assets acquired at the acquisition dates during the measurement periods. Any adjustments to the preliminary purchase price allocation identified during the measurement period, which will not exceed one year from the acquisition date, will be accounted for prospectively.

The Company incurred $7,615 of transaction costs related to this acquisition, which are included in general and administrative expenses in the Consolidated Statement of Operations for the year ended December 31, 2021.

The results of operations of the acquired business and the fair value of the acquired assets and liabilities assumed are included in the Company's consolidated financial statements with effect from the date of the acquisition. The Company's Consolidated Statement of Operations and Comprehensive Loss for the year ended December 31, 2021 includes revenues of $6,129 and a net income of $380 which includes the effects of purchase accounting adjustments, primarily changes in amortization of intangible assets.

Supplemental Pro Forma Information (unaudited)

The following unaudited pro forma combined financial information assumes that the acquisition of Pinnacle occurred on January 1, 2020.

	For the year ended December 31	
	2021	2020
Revenues	$ 303,234	$ 262,048
Net loss	$ (11,307)	$ (49,012)

The unaudited pro forma combined results for the years ended December 31, 2021 and 2020 primarily include the following pro forma adjustments:

- Incremental amortization expense, net of tax, related to Pinnacle purchased intangible assets in an amount of $5,246 and $7,001 for the years ended December 31, 2021 and 2020, respectively.

- Incremental equity-based compensation expense, net of tax, related to replacement awards in an amount of $641 and $856 for the years ended December 31, 2021 and 2020, respectively.

Integrated Nonclinical Development Solutions, Inc.

On January 3, 2022, the Company completed the acquisition of Integrated Nonclinical Development Solutions, Inc. ("INDS"), a company that provides the SEND Explorer® software and drug development consulting, for total consideration of $7,078. The Company will complete the initial accounting for the acquisition of INDS, including the allocation of purchase consideration, in the first quarter of 2022.

6. Prepaid Expenses and Other Current Assets and Other Supplemental Assets Information

Prepaid and other current assets consisted of the following:

	DECEMBER 31,	
	2021	2020
Prepaid expenses	$ 8,973	$ 7,372
Income tax receivable	4,800	7,098
Research and development tax credit receivable	3,951	3,610
Current portion of interest rate swap asset	57	—
Other current assets	767	1,122
Prepaid expenses and other current assets	$ 18,548	$ 19,202

Other long-term assets consisted of the following:

	DECEMBER 31,	
	2021	2020
Long-term deposits	$ 1,160	$ 1,163
Deferred financing cost	1,007	—
Total other long-term assets	$ 2,167	$ 1,163

7. Property and Equipment

Property and equipment consisted of the following:

	DECEMBER 31,	
	2021	2020
Computer and office equipment	$ 5,955	$ 5,619
Furniture	3,075	3,147
Purchased software for internal use	698	679
Leasehold improvements	1,762	2,386
Property and equipment	11,490	11,831
Less: Accumulated depreciation and amortization	(8,555)	(7,959)
Property and equipment, net	$ 2,935	$ 3,872

Depreciation and amortization expense were $2,135, $2,443, and $2,596 for the years ended December 31, 2021, 2020, and 2019, respectively.

8. Goodwill and Other Intangible Assets

The following table presents the Company's intangible assets (other than goodwill) and the related amortization:

	WEIGHTED AVERAGE AMORTIZATION PERIOD (IN YEARS)	DECEMBER 31, 2021			DECEMBER 31, 2020		
		GROSS CARRYING AMOUNT	ACCUMULATED AMORTIZATION	NET	GROSS CARRYING AMOUNT	ACCUMULATED AMORTIZATION	NET
Acquired software	14.38	$ 127,123	$ (12,258)	$ 114,865	$ 24,275	$ (8,099)	$ 16,176
Capitalized software development costs	2.71	31,477	(20,137)	11,340	24,009	(13,930)	10,079
Non-compete agreements	1.73	1,391	(1,247)	144	1,353	(1,145)	208
Trade names	15.36	56,483	(9,142)	47,341	40,683	(6,845)	33,838
Customer relationships	11.04	464,678	(126,545)	338,133	433,297	(97,153)	336,144
Total		$ 681,152	$ (169,329)	$ 511,823	$ 523,617	$ (127,172)	$ 396,445

Amortization expense for intangible assets was $42,980, $40,310, and $38,964 for the years ended December 31, 2021, 2020, and 2019, respectively. Amortization expense of $4,265, $2,896, and $2,723 was recorded in cost of revenues for the years ended December 31, 2021, 2020, and 2019, respectively.

The remaining amortization of $38,715, $37,414, and $36,241 was recorded in operating expenses for the years ended December 31, 2021, 2020, and 2019, respectively.

Based on the current amount of intangibles subject to amortization, the estimated annual amortization expense for each of the succeeding five years and thereafter is as follows:

	ACQUIRED SOFTWARE	CAPITALIZED SOFTWARE DEVELOPMENT COSTS	NON-COMPETE AGREEMENTS	TRADE NAMES	CUSTOMER RELATIONSHIPS	TOTAL
2022	$ 9,243	$ 5,316	$ 97	$ 3,087	$ 31,134	$ 48,877
2023	9,054	3,690	43	3,087	31,134	47,008
2024	8,686	2,310	4	3,087	31,134	45,221
2025	8,531	24	—	3,087	31,134	42,776
2026	8,388	—	—	3,087	31,134	42,609
Thereafter	70,963	—	—	31,906	182,463	285,332
Total	$ 114,865	$ 11,340	$ 144	$ 47,341	$ 338,133	$ 511,823

Goodwill

The Company has not recognized any impairment charges for the years ended December 31, 2021, 2020, and 2019. A reconciliation of the change in the carrying value of goodwill is as follows:

Balance, December 31, 2019	**$** 514,996
Goodwill associated with 2020 business combinations	685
Foreign currency translation	2,911
Balance, December 31, 2020	518,592
Goodwill associated with 2021 business combinations	186,771
Foreign currency translation	(1,992)
Balance, December 31, 2021	**$** 703,371

9. Accrued Expenses and Other Supplemental Liabilities Information

Accrued expenses consist of the following:

	DECEMBER 31, 2021	DECEMBER 31, 2020
Accrued compensation	$ 24,848	$ 24,941
Accrued severance	—	143
Product distributor fees	—	149
Legal and professional accruals	2,477	2,779
Local sales and VAT taxes	—	58
Interest payable	96	39
Income taxes payable	1,398	854
Deferred rent	—	919
Contingent earn out	—	230
Other	1,011	617
Total accrued expenses	$ 29,830	$ 30,729

Other current liabilities consist of the following:

	DECEMBER 31,	
	2021	2020
Current portion of interest rate swap liability	$ 1,088	$ 2,605
Current operating lease liabilities	5,040	—
Current finance lease liabilities	293	275
Total other current liabilities	$ 6,421	$ 2,880

Other long-term liabilities consist of the following:

	DECEMBER 31,	
	2021	2020
Non-current portion of interest rate swap liability	$ —	$ 1,066
Non-current finance lease liabilities	25	318
Total other long-term liabilities	$ 25	$ 1,384

10. Long-Term Debt and Revolving Line of Credit

Effective August 14, 2017, the Company entered into a credit agreement with lenders for a $250,000 term loan ("Credit Agreement"). The Credit Agreement is a syndicated arrangement with various lenders providing the financing. The $250,000 term loan is due to mature on August 14, 2024. The Company also entered into a $20,000 revolving line of credit with lenders with a sub-commitment for issuance of letters of credit of $10,000.

The Company and lenders entered into Amendment No. 1 to the Credit Agreement on January 25, 2018, where an additional tranche of $25,000 was added to the term loan. The amortization schedule of the new tranche was made coterminous with the rest of the term loan. There were no other changes to the terms of the Credit Agreement.

The Company and lenders entered into Amendment No. 2 to the Credit Agreement on April 3, 2018, where an additional tranche of $40,000 was added to the term loan. The amortization schedule of the new tranche was made coterminous with the rest of the term loan. There were no other changes to the terms of the Credit Agreement.

The Company and lenders entered into a third amended and restated loan agreement on June 17, 2021 ("Third Amendment"), which provides for, among other things, (i) the extension of the termination date applicable to the revolving credit commitments under the Credit Agreement to August 2025, (ii) the extension of the maturity date applicable to the term loans under the Credit Agreement to August 2026, and (iii) an increase of approximately $80,000 in commitments available under the revolving line of credit (resulting in an aggregate amount of commitments of $100,000). The term loan under the Third Amendment has substantially the same terms as the existing term loans and revolving credit commitments. The Credit Agreement is collateralized by substantially all U.S. assets and stock pledges for the non-U.S. subsidiaries and contain various financial and nonfinancial covenants.

As of December 31, 2021 and 2020, available borrowings under the revolving lines of credits were $100,000 and $20,000, respectively. Available borrowings under the revolving lines of credits of $100,000 and $20,000 as of December 31, 2021 and 2020, respectively, were reduced by $239 and $120 standby letter of credit issued to a landlord in lieu of a security deposit.

The Company was in compliance with all covenants as of December 31, 2021 and 2020. Borrowings under the Credit Agreement are subject to a variable interest rate at LIBOR plus a margin. The applicable margins are based on achieving certain levels of compliance with financial covenants.

The effective interest rate was 3.65% and 4.48% for the years ended December 31, 2021 and 2020, respectively, for the Credit Agreement. As discussed previously, the Company entered into interest rate swap agreements that fixed the interest rate.

Interest paid on the Credit Agreement with respect to the term loan amounted to $11,211, $13,960, and $18,520 for the years ended December 31, 2021, 2020, and 2019, respectively. Accrued interest payable on the Credit Agreement with respect to the term loan amounted to $30 and $32 at December 31, 2021 and 2020, respectively, and is included in accrued expenses. Interest paid on the Credit Agreement with respect to the revolving line of credit amounted to $93, $457, and $174 for the years ended December 31, 2021, 2020, and 2019, respectively. There was $66 accrued interest payable and no accrued interest payable on the revolving line of credit at December 31, 2021 and 2020, respectively.

Effective August 14, 2017, the Company entered into an unsecured credit agreement with another lender for a $100,000 term loan ("Loan Agreement"). The loan bears interest at 8.25% which is payable in semi-annual installments on January and July 15 through August 14, 2025, at which time all outstanding principal and interest are due. Under the Loan Agreement, the Company could voluntarily repay outstanding loans without premium or penalty. On July 15, 2020, the Company made a $20,000 prepayment on the loan, which reduced the amount outstanding to $80,000. On December 28, 2020, the Company repaid the remaining $80,000 aggregate principal amount owed under the Loan Agreement, including $3,000 of accrued interest using a portion of the proceeds from the IPO. The Company's obligations under the Loan Agreement were discharged on that date. Interest paid on the loan amounted to $0, $11,449, and $8,365 for the years ended December 31, 2021, 2020, and 2019, respectively.

Long-term debt consists of the following:

	DECEMBER 31,	
	2021	2020
Term loans	$ 300,490	$ 304,099
Revolving line of credit	—	—
Less: debt issuance costs	(5,724)	(5,319)
Total	294,766	298,780
Current portion of long-term debt	(3,020)	(4,680)
Long-term debt, net of current portion and debt issuance costs	$ 291,746	$ 294,100

The principal amount of long-term debt outstanding as of December 31, 2021, matures in the following years:

	2022	2023	2024	2025	2026	TOTAL
Maturities	$ 3,020	$ 3,020	$ 3,020	$ 3,020	$ 288,410	$ 300,490

The Credit Agreement requires the Company to make an annual mandatory prepayment as it relates to the Company's Excess Cash Flow calculation. For the year ended December 31, 2021, and 2020, the Company was required to make a mandatory prepayment on the term loan of $0, and $1,527, respectively. For the third credit agreement, the Company is required to make a quarterly principal payment of $755 on the term loan each quarter starting from the end of September 2021.

The fair values of the Company's variable interest term loan and revolving line of credit are not significantly different than their carrying value because the interest rates on these instruments are subject to change with market interest rates.

11. Employee Benefit Plan

The Company established a defined contribution 401(k) plan covering all U.S. employees who are at least 21 years of age. Employees may contribute to the plan up to 50% of their compensation, which may be further limited by law. In addition, employees who reached the age of 50 during the calendar years 2021, 2020, and 2019 are eligible to make an additional catch up contribution of 6.0%, subject to income limitations. The Company matches employee contributions for a percentage of the employee's deferral, not to exceed the first 6% of each employee's compensation.

The Company also operates a Group Personal defined contribution plan covering all U.K. employees. Employees are auto enrolled in the plan who are at least 22 years of age and paid more than £10 a year, up to the State Pension Age. However, all employees who are between the ages of 16 and 75 can elect to join the Plan. Employees may contribute to their personal pension account and then convert that account into income at retirement. The Company contributes an additional 8% of salary for those employees who have registered for the Plan, which exceeds their duties under U.K. auto enrolment legislation.

Total 401(k) contributions made by the Company were $4,138, $3,342, and $2,864 for the years ended December 31, 2021, 2020, and 2019 respectively.

12. Commitments and Contingencies

Legal proceedings

The Company does not have any pending or threatened litigation which, individually or in the aggregate, would have a material adverse effect on the consolidated financial statements as of December 31, 2021.

Assurance-type warranty

The Company includes an assurance commitment warranting the application software products will perform in accordance with written user documentation and the agreements negotiated with customers. Since the Company does not customize its applications software, warranty costs are insignificant and expensed as incurred.

For information related to commitments for future minimum lease payments, please see Note 14 – Lease.

13. Equity-Based Compensation

Class B Plan

The Company's management, through the Company's affiliation with its shareholder and former parent, EQT, participated in a 2017 Class B Profits Interest Unit Incentive Plan (the "Class B Plan"), whereby EQT was authorized to issue a total of 6,366,891 Profit Interest Units ("Class B Units"), representing the right to share a portion of the value appreciation in EQT.

The majority of the employee grant agreements for the Class B Units were comprised of 50% time-based vesting units ("Time-based Units") and 50% performance-based vesting units ("Performance-based Units"). The Time-based Units generally vested over a five-year period; The Performance-based Units would vest if EQT achieved specified levels of return on investment at the time of i) a change in control, ii) a reduction in holdings of the Company by EQT to 10% or less following an IPO or iii) certain distributions to EQT. There were also certain grant agreements for the Class B Units that were entirely comprised of Time-based Units. Upon vesting, the holder of Class B Units received a right to a fractional portion of the profits and distributions of the parent in excess of a "participation threshold" determined in accordance with the EQT limited partnership agreement.

In addition to the performance conditions above, the Chief Executive Officer's ("CEO") performance-based Class B Units also vested if the aggregate value attributable to an IPO equaled or exceeded an amount equivalent to the return on investment performance targets.

The Class B Units were in a secondary position to the Class A units in EQT, in that in any event in which the EQT equity was valued and paid out, holders of the Class B Units would only be paid if an amount at least equal to the applicable participation threshold was first allocated to all of the outstanding classes of units under EQT's limited partnership agreement. In addition, EQT had the right, but not the obligation, to repurchase units at fair value upon certain events, such as a termination of employment. During the years ended December 31, 2020 and 2019, EQT repurchased 87,930 and 241,601 Class B Units at their intrinsic value of $1,079 and $703 respectively. These repurchases were funded through

dividends paid by the Company to EQT. These Class B Units do not have a maximum contractual life, and as such, these Class B Units do not expire.

The fair value of the Time-based Units that vested solely upon continued employment was measured at the grant date and was recognized as cost over the employee's requisite service period, which was generally five years. The expense related to the vesting of the Time-based Units was recorded on the Company's books because the Company directly benefited from the services provided by Class B Unit holders. The grant date fair values were determined based on the pricing models and valuation assumptions noted in the following table, shown at their weighted-average values:

	YEAR ENDED DECEMBER 31,	
	2020	2019
Pricing model	Monte Carlo	Monte Carlo
Expected dividend yield	0.0 %	0.0 %
Risk-free interest rate[1]	0.3 %	1.6 %
Expected stock price volatility[2]	59 %	55 %
Expected exercise term (in years)[3]	2.3	2.0

(1) Based on the U.S. Treasury constant maturity interest rate whose term is consistent with the expected exercise term of our incentive units

(2) In projecting expected stock price volatility, we consider the historical volatility of the stock prices of comparable public companies.

(3) The Company estimates the expected life of incentive units based upon the timing of a potential liquidity event.

A summary of the Class B Units activity for the period is presented below (dollar amounts are not in thousands):

	UNITS	WEIGHTED AVERAGE Weighted-Average Grant-Date Fair Value Per Unit	Weighted-Average Exercise Price Per Unit
Outstanding, as of December 31, 2019	5,436,299	$ 3.53	11.43
Granted	1,357,408	7.39	26.96
Exercised	(87,930)	3.55	10.2
Forfeited	(377,626)	3.63	10.3
Exchanged	(6,328,151)	4.37	—
Outstanding, December 31, 2020	—	$ —	—

Outstanding units represent the total of vested Class B Units and those expected to vest, including Time-based Units for which the requisite service period has not yet been rendered. Of those Class B Units that were vested and exercisable at December 31, 2019, the weighted-average distribution threshold was $10.16. The weighted-average grant date fair value per unit was $3.53 as of December 31, 2019.

The aggregate intrinsic value of Class B Units outstanding, vested and exercisable at December 31, 2019 was $38,440. There were no Class B Units outstanding as of December 31, 2020.

The total fair value of Class B Units vested and exercisable during 2019 was $1,872. Equity-based compensation expense related to the Time-based Units was $2,776 and $1,691 for the years ended December 31, 2020 and 2019. The Performance-based Units were not probable of vesting prior to the exchange of Class B Units for common shares, as described below; as such, no expense was recorded for these Units prior to the IPO. As of December 31, 2020, there were no unrecognized compensation costs related to the Units as they had been exchanged for restricted stock as discussed below.

Exchange

Effective as of December 10, 2020 (the "Exchange Date"), all vested Class B Units were exchanged by EQT for shares of common stock of the Company held by EQT, and unvested Class B Units were exchanged for shares of restricted common

stock of the Company. On the Exchange Date, holders of unvested Time-based and Performance-based Units elected to either (1) exchange their unvested Class B Units with shares of restricted common stock of the Company that maintained the same vesting conditions (both time-based and performance-based) of such unvested Class B Units or (2) exchange their unvested Class B Units (both Time-based and Performance-based Units) with shares of restricted common stock of the Company that would be subject only to the same time-vesting conditions of such unvested Time-based Units, based on the original grant date. 53 holders of Class B Units elected the latter option. The CEO elected for the former option, based on the fact that his Performance-based Units vested upon the consummation of the offering. The number of shares of common stock exchanged by EQT for vested Class B Units and number of shares of restricted common stock exchanged by EQT for unvested Class B Units were based on their deemed value as of the date of the offering divided by the estimated per share offering price. The deemed value of Class B Units considered the overall implied value of the Company based on the offering price and considering their economic rights pursuant to the contractual waterfall and related distribution thresholds.

Based on the IPO price of $23.00 per share, the Company issued 5,941,693 shares of restricted common stock to holders of unvested Class B Units in exchange for such unvested Class B Units and holders of vested Class B Units received an aggregate of 4,211,598 shares of common stock in exchange for vested Class B Units.

Modification accounting was not required for the time-based vesting Class B Units for which the vesting conditions, classification and fair market value did not change as a result of the shares of restricted common stock that replaced them. The original grant date fair value will continue to be recognized on a straight-line basis.

Modification accounting was required for the performance-based vesting Class B Units that were exchanged for time-based vesting restricted common stock, given the vesting conditions were changed. Such performance-vesting Class B Units that were improbable of vesting were remeasured based on the modification date fair value of the shares of restricted common stock replacing such Class B Units. The total fair value of the restricted stock was $83,260. Because the service inception date preceded the grant date of the replacement awards, a catch up-adjustment of $56,487 was recorded at the modification date, based on the portion of the requisite service period that had elapsed since the original grant date for each tranche of the award. Considering the original awards contained performance conditions necessary to vest, the accelerated attribution approach was applied. The accelerated attribution approach results in cost being allocated to each of the tranches of the awards and recognized ratably over each tranche as if they were separate awards.

Separately, upon completion of the offering, $3,912 of compensation cost was recognized related to our Chief Executive Officer’s 853,001 performance-based Class B Units that automatically vested upon the IPO of the Company and were exchanged for 1,561,950 common shares of the Company.

Restricted Stock

As detailed above, unvested Class B Units were exchanged for restricted stock of the Company. Share based compensation for the restricted stock exchanged for the time-based Class B Units is recognized on a straight-line basis over the requisite service period of the award, which is generally five years. Share-based compensation for the restricted stock exchanged for the performance-based Class B Units is recognized using the accelerated attribution approach.

A summary of the restricted stock in 2021 is shown below:

	SHARES	WEIGHTED-AVERAGE GRANT-DATE FAIR VALUE
Non-vested restricted stock as of December 31, 2020	5,941,693	$ 23.00
Granted	87,127	31.70
Vested	(1,957,054)	23.02
Forfeited	(161,044)	23.00
Non-vested restricted stock as of December 31, 2021	3,910,722	$ 23.18

The Company granted 87,127 replacement shares of restricted stock in 2021 in connection with the Pinnacle business acquisition under which equity-based awards are outstanding. The fair value of the per share of restricted stock issued in 2021 was measured using grant date fair market value adjusted lack of marketability for these shares. Total grant date fair value was $2,762. The restricted stock issued in 2021 generally have a three year vesting period except for one holder whose shares vests equally on a monthly basis for 2 years. The Company exchanged 5,941,693 shares discussed in previous section in 2020 and was not authorized and did not issue any restricted stock in 2019.

Equity-based compensation expenses related to the restricted stock exchanged for performance-based Class B units were $12,349 and $57,421 for the years ended December 31, 2021 and 2020, respectively. At December 31, 2021, the total unrecognized equity-based compensation expenses related to outstanding restricted stock recognized using the accelerated attribution approach was $11,638. The unrecognized compensation expense for the category at December 31, 2021 is expected to be recognized over a weighted-average period of 24.6 months.

Equity-based compensation expenses related to the time-based restricted stock were $3,104 and $167 for the years ended December 31, 2021 and 2020, respectively. At December 31, 2021, the total unrecognized equity-based compensation expenses related to outstanding restricted stock recognized using the straight-line attribution approach were $6,394. The unrecognized compensation expense for the category at December 31, 2021 is expected to be recognized over a weighted-average period of 33.2 months.

Equity-based employee compensation expense related to the time-based restricted stock for the Pinnacle acquisition was $292 for the year ended December 31, 2021. At December 31, 2021, the total unrecognized equity-based compensation expenses related to outstanding restricted stock recognized using the straight-line attribution approach was $2,470. The unrecognized compensation expense for the category at December 31, 2021 is expected to be recognized over a weighted-average period of 26.7 months.

2020 Incentive Plan

In order to align our equity compensation program with public company practices, the Company's Board of Directors adopted and stockholders approved the 2020 Incentive Plan. The 2020 Incentive Plan allows for grants of non-qualified stock options, incentive stock options, restricted stock, and restricted stock units (RSUs) to employees, directors and officers, and consultants or advisors of the Company. The 2020 Incentive Plan allows for 20,000,000 shares (the "plan share reserve") of common stock to be issued. No more than the number of shares of common stock equal to the plan share reserve may be issued in the aggregate pursuant to the exercise of incentive stock options. The maximum number of shares of common stock granted during a single fiscal year to any non-employee director, taken together with any cash fees paid to such non-employee director during the fiscal year, may not exceed $1,000,000 in total value, except for certain awards made to a non-executive chair of our board of directors. At December 31, 2021, there was 19,898,104 shares reserved for future issuance.

The plan share reserve will be increased on the first day of each fiscal year beginning with the 2021 fiscal year and ending after the tenth anniversary of the effective date in an amount equal to the lesser of (i) the positive difference, if any, between (x) 4.0% of the outstanding common stock on the last day of the immediately preceding fiscal year and (y) the plan share reserve on the last day of the immediately preceding fiscal year and (ii) a lower number of shares of our common stock as determined by our board of directors.

Restricted Stock Units

Restricted stock units ("RSUs") represent the right to receive shares of the Company's common stock at a specified date in the future. During year ended December 2021, the Company granted 1,347,265 RSUs under the 2020 Incentive Plan that generally vest over an average three-year period. The fair value of the RSUs is based on the fair value of the underlying shares on the date of grant.

A summary of the Company's RSU activity is as follows:

	UNITS	WEIGHTED-AVERAGE GRANT DATE FAIR VALUE
Non-vested RSUs as of December 31, 2020	30,052	$ 23.00
Granted	1,347,265	29.19
Vested	(24,728)	23.00
Forfeited	(63,865)	26.80
Non-vested RSUs as of December 31, 2021	1,288,724	$ 29.28

Equity-based compensation expense related to the RSUs was $8,257 and $81 for the years ended December 31, 2021 and 2020, respectively. At December 31, 2021, the total unrecognized equity-based compensation expense related to outstanding RSUs was $29,914, which is expected to be recognized over a weighted-average period of 28.5 months.

Performance Restricted Stock Units

Performance stock units ("PSUs") are issued under the 2020 Incentive Plan and represent the right to receive shares of the Company's common stock at a specified date in the future based on the satisfaction of various service conditions and the achievement of certain performance thresholds including year over year revenue growth and unlevered free cash flow growth.

Equity-based compensation for the PSUs is only recognized to the extent a threshold is probable of being achieved and is recognized using the accelerated attribution approach. The Company will continue to assess the probability of each

condition being achieved at each reporting period to determine whether and when to recognize compensation cost. The following table presents a summary of activity on the PSUs for the period ended December 31, 2021.

	UNITS	WEIGHTED-AVERAGE GRANT DATE FAIR VALUE
Non-vested PSUs as of December 31, 2020	—	$ —
Granted	418,480	27.36
Vested	—	—
Forfeited	(11,905)	27.45
Non-vested PSUs as of December 31, 2021	406,575	$ 27.35

Equity-based compensation expense related to the PSUs was $5,481 for the year ended December 31, 2021. At December 31, 2021, the total unrecognized equity-based compensation expense related to outstanding PSUs was $5,141, which is expected to be recognized over a weighted-average period of 19.77 months.

The number of restricted stock awards and RSUs vested in 2021 includes 11,103 shares that were withheld on behalf of employees to satisfy the statutory tax withholding requirements.

2020 Employee Stock Purchase Plan

On December 10, 2020, stockholders approved the 2020 Employee Stock Purchase Plan (the "Employee Stock Purchase Plan"). Under the Employee Stock Purchase Plan, employees, and those of the Company's subsidiaries, may purchase shares of common stock, during pre-specified offering periods. Named executive officers will be eligible to participate in the Employee Stock Purchase Plan on the same terms and conditions as all other participating employees. The maximum number of shares authorized for sale under the Employee Stock Purchase Plan is 1,700,000 shares.

Generally, all employees and those of the Company's subsidiaries will be eligible to participate in the Employee Stock Purchase Plan, except for employees who own 5% or more of the combined voting power or value of all issued and outstanding stock. Employees may contribute through payroll deductions of 1% to 15% of such employees' base compensation on each payroll date that falls within an offering period. Participants may not acquire rights to purchase more than $25 of common stock under the Employee Stock Purchase Plan for any calendar year. Common stock will be available for purchase for up to 27 months.

Shares will be purchased at a discounted per-share purchase price equal to 85% of the per-share closing price of the Company's common stock on the last day of the applicable offering period.

As of December 31, 2021, no shares of common stock have been purchased under the Employee Stock Purchase Plan and no offering has been made to eligible employees under the Plan.

Equity-based compensation expense

The following table summarizes the components of total equity-based compensation expense included in the Consolidated Statements of Operations and Comprehensive Loss for each period presented:

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
Cost of revenues	$ 5,193	$ 8,805	$ 156
Sales and marketing	2,204	7,390	110
Research and development	2,872	7,133	121
General and administrative expenses	19,214	41,179	1,304
Total	$ 29,483	$ 64,507	$ 1,691

The tax benefit related to compensation expense was $117 for the year ended December 31, 2021. There were no tax benefits related to compensation expense for the year ended December 31, 2020 and 2019.

14. Leases

The Company leases certain office facilities and equipment under non-cancelable operating and finance leases with remaining terms from one to seven years.

Operating lease ROU assets are included in other asset section while finance lease ROU assets are included in "Property and equipment, net" in the consolidated balance sheets. With respect to operating lease liabilities, current and non-current operating lease liabilities are included in "Other current liabilities" and "Operating lease liabilities, net of current portion." Current and non-current finance lease liabilities are included in "Other current liabilities" and "Other long-term liabilities" in the Consolidated Balance Sheets.

The following table presents information about the operating and finance lease right-of-use assets and lease liabilities as well as lease term and discount rates:

Lease right-of-use assets, lease liabilities, lease term and discount rate:	December 31, 2021
Lease right of use assets	
Operating leases	$ 12,634
Financing leases	271
	$ 12,905
Lease liabilities	
Current	
Operating leases	$ 5,040
Financing leases	293
Noncurrent	
Operating leases	8,256
Financing leases	25
	$ 13,614

	For the year ended
Weighted-average remaining lease term (years):	December 31, 2021
Operating leases	3.63
Financing leases	1.08
Weighted-average discount rate:	
Operating leases	3.91%
Financing leases	6.19%

The components of total lease cost were as follows:

	December 31, 2021
Operating lease cost	$ 5,815
Short-term lease cost	404
Variable lease cost	744
Sublease income	(490)
Finance lease cost:	
Amortization of right-of-use assets	277
Interest on lease liabilities	29
Total lease cost	$ 6,779

Supplemental cash flow and non-cash flow information was as follows:

	December 31, 2021
Cash paid for amounts included in the measurement of lease liabilities	
Operating cash flows from finance leases	$ 29
Operating cash flows from operating leases	$ 6,105
Financing cash flows from finance leases	$ 275
Right-of-use assets obtained in exchange for new and remeasured operating leases	$ 520
Right-of-use assets obtained through acquisition	$ 1,648

The following table summarizes by year the maturities of our minimum lease payments as of December 31, 2021.

	OPERATING LEASES	FINANCE LEASES
Year ending December 31,		
2022	$ 5,138	$ 304
2023	3,246	25
2024	2,564	—
2025	1,930	-
2026	1,326	-
Thereafter	135	-
Total future lease payments	14,339	329
Less: imputed interest	(1,043)	(11)
Total	$ 13,296	$ 318

The gross amounts of assets under capital leases, in accordance with the superseded leasing standard (ASC 840), was $1,501 at December 31, 2020. The total accumulated amortization associated with equipment under capital leases was approximately $946 at December 31, 2020. The related amortization expense is included in depreciation expense. Rent expense under the operating leases was $6,534 and $6,377 for the years ended December 31, 2020 and 2019, respectively.

Non-cancelable future minimum lease commitments as of December 31, 2020, in accordance with the superseded leasing standard, were:

Year ending December 31,	Operating Leases	Capital Leases
2021	$ 6,023	$ 304
2022	4,698	304
2023	3,191	25
2024	2,559	—
2025	2,065	—
Thereafter	2,372	—
Non-cancelable future minimum lease payments	20,908	633
Less amount representing interest	—	(40)
Net non-cancelable future minimum lease payments	$ 20,908	$ 593

15. Segment data

Operating segments are defined as components of an enterprise about which separate financial information is available that is evaluated regularly by the chief operating decision maker ("CODM"), in deciding how to allocate resources and in assessing performance.

The Company has determined that its chief executive officer ("CEO") is its CODM. The Company manages its operations as a single segment for the purpose of assessing and making operating decisions. The Company's CODM allocates resources and assesses performance based upon financial information at the consolidated level. Since the Company operates in one operating segment, all required financial segment information can be found in the consolidated financial statements.

The following table summarizes revenue by geographic area:

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
Revenue[1]:			
Americas	$ 205,377	$ 182,629	$ 154,505
EMEA	56,410	42,844	40,299
Asia Pac	24,317	18,057	13,707
Total	$ 286,104	$ 243,530	$ 208,511

(1) Revenue is attributable to the countries based on the location of the customer

The following table summarizes property, plant and equipment, net by geographic area as of December 31, 2021 and 2020:

	DECEMBER 31,	
	2021	2020
Property, plant and equipment, net:		
Americas	$ 1,903	$ 2,691
EMEA	712	817
Asia Pac	320	364
Total	$ 2,935	$ 3,872

16. Income Taxes

The components of loss before income taxes were as follows:

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
Domestic	$ (10,373)	$ (55,355)	$ (12,995)
Foreign	6,998	5,174	3,844
Total	$ (3,375)	$ (50,181)	$ (9,151)

The components of provision for (benefit from) income taxes were as follows:

	DECEMBER 31,		
	2021	2020	2019
Current tax provision			
Federal	$ 451	$ 326	$ 483
State and local	1,798	1,659	1,692
Foreign	8,826	4,634	4,303
Total current	11,075	6,619	6,478
Deferred tax benefit			
Federal	(4,416)	(3,620)	3,137
State and local	(1,156)	276	(5,431)
Foreign	4,388	(4,059)	(4,409)
Total deferred	(1,184)	(7,403)	(6,703)
Total provision (benefit)	$ 9,891	$ (784)	$ (225)

The effective income tax rate was (293.06%), 1.56%, and 2.46% for the years ended December 31, 2021, 2020 and 2019, respectively. The primary reconciling items between the statutory income tax rate of 21% and the effective income tax rate were as a result of the following:

	2021		2020		2019	
Tax at U.S. federal statutory rate	$ (709)	21.00 %	$ (10,538)	21.00 %	$ (1,919)	21.00 %
State taxes, net of federal benefit	226	(6.71)%	1,125	(2.24)%	(3,852)	42.14 %
Foreign rate differential	3,872	(114.72)%	2,296	(4.58)%	1,654	(18.09)%
Permanent items	(670)	19.84 %	(139)	0.28 %	(177)	1.93 %
Equity compensation	3,534	(104.70)%	13,562	(27.03)%	412	(4.51)%
GIL TI inclusion	540	(16.00)%	932	(1.86)%	570	(6.24)%
Tax credits	(7,060)	209.19 %	(7,618)	15.18 %	(4,264)	46.65 %
Rate change	5,256	(155.75)%	2,076	(4.14)%	(2,922)	31.97 %
Other adjustments	3,131	(92.76)%	1,223	(2.43)%	3,736	(40.87)%
Return to provision adjustments	(66)	1.95 %	(103)	0.21 %	(139)	1.52 %
Valuation allowance	1,837	(54.40)%	(3,600)	7.17 %	6,676	(73.04)%
Effective tax rate	$ 9,891	(293.06)%	$ (784)	1.56 %	$ (225)	2.46 %

A portion of the Company’s income was attributable to Madeira, Portugal, which qualified for special tax programs authorized by the European Union. For the period of 2008 through 2011, the Company was subject to Madeira's income tax rate of 0%, for 2012 an income tax rate of 4% applied, and for the period of 2013 through 2020 an income tax rate of 5% applied, and for the period 2021 through 2027 an income tax rate of 5% will apply.

The tax effects of temporary differences that gave rise to deferred tax assets and liabilities are summarized as follows:

	DECEMBER 31,	
	2021	2020
Deferred tax assets		
Accounts receivable	$ 61	$ 29
Accrued compensation	3,552	4,222
Accrued expenses	-	137
Deferred revenue	696	—
Net operating loss carryforwards	4,117	5,229
R&D credit carryforward	4,965	7,054
Foreign tax credits	15,054	12,485
Interest rate hedge	253	925
Equity based compensation	3,015	—
Other assets	380	115
Interest expense	224	869
Right-of-use (ROU) Liability	2,944	—
Total gross deferred tax asset	35,261	31,065
Less: Valuation allowance	(18,235)	(16,715)
Net deferred tax asset	17,026	14,350
Deferred tax liabilities		
Property, equipment, and other long-lived assets	(272)	(359)
Goodwill and intangible assets	(83,844)	(83,935)
Prepaid expenses	(1,968)	(1,724)
Accrued expenses	(184)	—
Deferred revenue	—	(1,482)
Right-of-use (ROU) Asset	(2,783)	—
Total gross deferred tax liability	(89,051)	(87,500)
Net deferred tax liability	$ (72,025)	$ (73,150)

The net change in the total valuation allowance resulted in an increase of $1,520 in 2021 compared to a decrease of $3,831 in 2020. The valuation allowance is determined separately for each jurisdiction. A U.S. valuation allowance was required against the foreign tax credit carryforward. At the foreign subsidiaries, the valuation allowance was primarily related to foreign net operating losses that, in the judgment of management, are not more likely than not to be realized.

In assessing the realizability of deferred tax assets, management considered whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible and carryforward attributes can be utilized. Management considered the reversal of deferred tax liabilities in making this assessment. Management believes it is more likely than not that the Company will realize the benefits of the deferred tax assets, net of the existing valuation allowance, at December 31, 2021.

At December 31, 2021, the Company has net operating loss carryforwards for federal income tax purposes of approximately $2,416, the majority of which will expire if unused in years 2024 through 2040. The Company has net operating loss carryforwards for state income tax purposes of approximately $2,576, which will expire if unused in years 2029 through 2039. The Company has foreign net operating loss carryforwards of $24,491 which will expire if unused starting in 2022.

The Company has $1,475 of federal research and development credits that will expire if unused in years 2025 through 2041, $417 of California research and development credits with indefinite carryover period, and $406 of foreign research and development credits that will expire if unused starting in 2029. The Company has foreign tax credits of $15,054 that will expire if unused in years 2025 through 2031, and also Canadian investment tax credits of $3,809 which will expire if unused in years 2030 through 2039.

The Company has net operating losses and tax credits that are subject to limitation under Internal Revenue Code Section 382 and Section 383 due to changes in ownership. The Company has analyzed the realizability of these tax attributes carried forward and have recorded deferred tax assets for the attributes that meet the more likely than-not realizability threshold.

Foreign undistributed earnings were considered permanently invested, therefore no provision for U.S. income taxes was accrued as of December 31, 2021 and 2020, with the exception of the withholding tax liability of $168 on the potential repatriation from Certara Canada Corporation.

The Company assessed its uncertain tax positions and determined that a liability of $1,059 and $897 was required to be recorded for uncertain tax positions as of December 31, 2021 and 2020, respectively. Uncertain tax positions relate primarily to federal and state R&D credits. The Company's policy is to recognize interest and penalties as a component of the provision for income taxes. For December 31, 2021 and 2020, there were no interest or penalties recorded. The Company does not anticipate any significant changes to its uncertain tax positions during the next 12 months.

A reconciliation of the beginning and ending balance of unrecognized tax benefits is as follows:

Balance at December 31, 2019	**$**	**690**
Additions for tax positions related to the current year		198
Additions for tax positions of prior years		9
Balance at December 31, 2020		**897**
Additions for tax positions related to the current year		156
Additions for tax positions of prior years		6
Balance at December 31, 2021	**$**	**1,059**

The uncertain tax positions, exclusive of interest and penalties, were $1,059 and $897 as of December 31, 2021 and December 31, 2020, respectively, which also represents potential tax benefits that if recognized, would impact the effective tax rate.

U.S. federal income tax returns are generally subject to examination for a period of three years after the filing of the return. However, the Internal Revenue Service can audit the NOLs generated in respective years in the years that the NOLs are utilized. State income tax returns are generally subject to examination for a period of three to six years after the filing of the respective return. The state impact of any federal changes remains subject to examination by various states for a period of up to one year after formal notification to the states. Foreign income tax returns are generally subject to examination based on the tax laws of the respective jurisdictions.

The Company is subject to tax on Global Intangible Low-Taxed Income (“GILTI”) and has elected to account for GILTI as a current period expense.

17. Earnings per Share

Basic and diluted earnings per share is computed by dividing net earnings by the weighted-average shares outstanding:

	YEAR ENDED DECEMBER 31,		
	2021	2020	2019
Numerator:			
Net loss	$ (13,266)	$ (49,397)	$ (8,926)
Denominator:			
Weighted average common shares outstanding, basic and diluted	149,842,668	133,247,212	132,407,786
Net loss per common share, basic and diluted	$ (0.09)	$ (0.37)	$ (0.07)

The Company excluded the restricted stock and restricted stock units from the calculation of diluted earnings per share during the years ended December 31, 2021 and 2020 that could potentially dilute earnings per share in the future due to being in a net loss position. For the year ended December 31, 2021, the Company did not include 3,910,722 restricted shares and 1,288,724 shares of time-based restricted stock units, and 61,456 shares of performance based restricted stock units in the calculation. For the year ended December 31, 2020, the Company did not include 5,941,693 restricted shares and 30,052 shares of restricted time-based stock units in the calculation. During the year ended December 31, 2019, there was no potentially dilutive securities outstanding.

18. Subsequent Events

On January 3, 2022, the Company completed the acquisition of Integrated Nonclinical Development Solutions, Inc. (“INDS”), a company that provides the SEND Explorer® software and drug development consulting, for total consideration of $7,078. The Company will complete the initial accounting for the acquisition of INDS, including the allocation of purchase consideration, in the first quarter of 2022.

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

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

As of the end of the period covered by this Annual Report on Form 10-K, we performed an evaluation under the supervision and with the participation of management, including our Chief Executive Officer and our Chief Financial Officer, of the design and effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) or 15d-15(e) under the Securities Exchange Act of 1934 as amended (the "Exchange Act"). Based upon that evaluation, our Chief Executive Officer and Chief Financial Officer concluded, as of the end of the period covered by this Annual Report that our disclosure controls and procedures were not effective due to a material weakness related to information technology general controls, as discussed in Management's Annual Report on Internal Control over Financial Reporting.

Notwithstanding the material weakness described in Management's Annual Report on Internal Control Over Financial Reporting, our management has concluded that our consolidated financial statements for the periods covered by and included in this Annual Report are prepared in accordance with accounting principles generally accepted in the United States ("GAAP") and fairly present, in all material respects, our financial position, results of operations and cash flows for each of the periods presented herein.

Management's Annual Report on Internal Control over Financial Reporting

See Management's Report of Internal Control Over Financial Reporting and the Report of Independent Registered Public Accounting Firm on our internal control over financial reporting in Item 8, which are incorporated herein by reference.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting (as such term is defined in Rules 13a-15(f) under the Exchange Act) during the quarter ended December 31, 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

None

Item 9C. Disclosure Regarding Foreign Jurisdictions That Prevent Inspections.

Not Applicable

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

We have adopted a Code of Conduct (the "Code of Conduct") applicable to all employees, executive officers and directors that addresses legal and ethical issues that may be encountered in carrying out their duties and responsibilities, including the requirement to report any conduct they believe to be a violation of the Code of Conduct. The Code of Conduct is available on our website, www.certara.com. The information available on or through our website is not part of this annual report. If we ever were to amend or waive any provision of our Code of Conduct that applies to our principal executive officer, principal financial officer, principal accounting officer or any person performing similar functions, we intend to satisfy our disclosure obligations with respect to any such waiver or amendment by posting such information on our internet website set forth above rather than by filing a Form 8-K.

The remaining information required under this item is incorporated herein by reference to our definitive proxy statement (the "Proxy Statement") pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended, which Proxy Statement is expected to be filed with Securities and Exchange Commission not later than 120 days after the close of our fiscal year ended December 31, 2021.

Item 11. Executive Compensation.

The information required by this item will be set forth in the Proxy Statement and is incorporated herein by reference.

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

The information required by this item will be set forth in the Proxy Statement and is incorporated herein by reference.

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

The information required by this item will be set forth in the Proxy Statement and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

The information required by this item will be set forth in the Proxy Statement and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) The following documents are filed as part of this Annual Report:
(1) Financial Statements

The financial statements filed as part of this Annual Report are included in Part II, Item 8 of this Annual Report.
(2) Financial Statement Schedules

Financial statement schedules have been omitted in this Annual Report because they are not applicable, not required under the instructions or the information requested is set forth in the financial statements or related notes thereto.
(3) List of Exhibits required by Item 601 of Regulation S-K

Incorporated by Reference

Exhibit Number	Exhibit Title	Form	File No.	Exhibit	Filing Date
2.1	Agreement and Plan of Merger dated as of August 2, 2021, by and among Certara, Inc., Puma Merger Sub, LLC and Shareholder Representative Services LLC, as the Equityholder Representative thereunder	8-K		2.1	8/5/2021
3.1	Amended and Restated Certificate of Incorporation of Certara, Inc.	S-8	333-251368	4.1	12/15/2020
3.2	Amended and Restated Bylaws of Certara, Inc.	S-8	333-251368	4.2	12/15/2020
4.1	Form of Stock Certificate for Common Stock	S-1/A	333-250182	4.1	12/03/2020
4.2	Description of Certara, Inc.'s Securities				
10.1	Stockholders Agreement, dated as of December 10, 2020 by and among Certara, Inc. and the other parties named therein	S-8	333-251368	4.5	12/15/2020
10.2	Amended and Restated Registration Rights Agreement, dated as of December 10, 2020 by and among Certara, Inc. and the other parties named therein				
10.3	Credit Agreement, dated as of August 15, 2017, among Certara Holdings, Inc. (f/k/a EQT Avatar Holdings, Inc.), Certara Holdco, Inc., Certara USA, Inc., EQT Avatar Intermediate, Inc., Jefferies Finance LLC, as Administrative Agent and Issuing Bank, Golub Capital LLC as Issuing Bank and each lender from time to time party thereto	S-1/A	333-250182	10.3	11/18/2020
10.4	First Amendment, dated as of January 24, 2018, to the Credit Agreement, among Certara Holdings, Inc. (f/k/a EQT Avatar Holdings, Inc.), Certara Holdco, Inc., Certara USA, Inc., EQT Avatar Intermediate, Inc., Jefferies Finance LLC, as Administrative Agent and Issuing Bank, Golub Capital LLC as Issuing Bank and each lender from time to time party thereto	S-1/A	333-250182	10.4	11/18/2020
10.5	Second Amendment, dated as of April 3, 2018, to the Credit Agreement, among Certara Holdings, Inc. (f/k/a EQT Avatar Holdings, Inc.), Certara Holdco, Inc., Certara USA, Inc., Certara Intermediate, Inc. (f/k/a EQT	S-1/A	333-250182	10.5	11/18/2020

	Avatar Intermediate, Inc.), Jefferies Finance LLC, as Administrative Agent and Issuing Bank, Golub Capital LLC as Issuing Bank and each lender from time to time party thereto				
10.6	Third Amendment, dated as of June 17, 2021, to the Credit Agreement, among Certara Holdings, Inc., Certara Holdco, Inc., Certara USA, Inc., Certara Intermediate, Inc., Bank of America, N.A., as Administrative Agent for the lenders from time to time party thereto and collateral agent for the secured parties thereunder	8-K		10.1	6/22/2021
10.7	Loan Guaranty, dated as of August 15, 2017, by and among the Loan Guarantors, as defined therein, and Jefferies Finance LLC, as Administrative Agent	S-1/A	333-250182	10.6	11/18/2020
10.8	Pledge and Security Agreement, dated as of August 15, 2017, by and among the Grantors, as defined therein, and Jefferies Finance LLC, as Agent	S-1/A	333-250182	10.7	11/18/2020
10.9	Loan Agreement, dated as of July 6, 2017, between Santo Holding (Deutschland) GmbH and Certara, Inc. (f/k/a EQT Avatar Topco, Inc.)	S-1/A	333-250182	10.8	11/18/2020
10.10*	Form of Indemnification Agreement between Certara, Inc. and directors and executive officers of Certara, Inc.	S-1/A	333-250182	10.9	11/25/2020
10.11*	Employment Agreement, dated as of May 14, 2019, by and among EQT Avatar Parent L.P., Certara USA, Inc. and William Feehery	S-1/A	333-250182	10.10	11/18/2020
10.12*	Employment Agreement, dated as of July 11, 2014, between Certara USA, Inc. and M. Andrew Schmick	10-K		10.11	3/15/2021
10.13*	Employment Agreement, dated as of July 20, 2020, between Certara USA, Inc. and Leif E. Pedersen	10-K		10.12	3/15/2021
10.14*	Certara, Inc. 2020 Incentive Plan	S-1/A	333-250182	10.18	11/25/2020
10.15*	Form of Restricted Stock Unit Grant and Award Agreement (Certara, Inc. 2020 Incentive Plan)	10-K		10.14	3-15-2021
10.16*	Form of Exchange Acknowledgement and Agreement	S-1/A	333-250182	10.19	12/03/2020
10.17*	Form of Stock Restriction Agreement	S-1/A	333-250182	10.20	12/03/2020
10.18*	Form of Performance Stock Unit Grant Notice and Agreement for Certara, Inc. 2020 Incentive Plan*	10-Q		10.1	5/7/2021
10.19*	Certara, Inc. 2020 Employee Stock Purchase Plan	S-1/A	333-250182	10.21	11/25/2020
10.20*	Certara, Inc. Directors Deferral Plan	10-K		10.18	3/15/2021
10.21*	Employment Agreement, dated September 26, 2018 between Certara UK Limited and Robert Aspbury				
10.22*	Employment Agreement, dated January 23, 2019, by and between EQT Certara USA, Inc. and Justin Edge	S-1/A	333-250182	10.15	11/8/2020
21.1	Subsidiaries of the Registrant				
23.1	Consent of CohnReznick LLP				
24.1	Power of Attorney (included in the signature page to this Annual Report)				
31.1	Certification of Principal Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				
31.2	Certification of Principal Financial and Accounting Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				

32.1	Certification of Principal Executive Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002+
32.2	Certification of Principal Financial Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002+
101.INS	XBRL Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (formatted in Inline XBRL and contained in Exhibit 101)

* Management contract or compensatory plan or arrangement.

\+ This certification is deemed not filed for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act.

Item 16. Form 10-K Summary.

None.

Signatures

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

CERTARA, INC.

Date: March 1, 2022

By: /s/ William F. Feehery
Name: William F. Feehery
Title: Chief Executive Officer
(Principal Executive Officer)

Date: March 1, 2022

By: /s/ M. Andrew Schemick
Name: M. Andrew Schemick
Title: Chief Financial Officer
(Principal Financial Officer)

KNOW ALL BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints William F. Feehery, M. Andrew Schemick and Richard M. Traynor and each of them, his or her true and lawful agent, proxy and attorney-in-fact, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their or his substitutes, may lawfully do or cause to be done by virtue thereof.

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

Signature	Title
/s/ William F. Feehery William F. Feehery	Chief Executive Officer and Director (Principal Executive Officer)
/s/ M. Andrew Schemick M. Andrew Schemick	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)
/s/ James E. Cashman III James E. Cashman III	Chairman
/s/ Eric C. Liu Eric C. Liu	Director
/s/ Stephen M. McLean Stephen M. McLean	Director
/s/ Mason P. Slaine Mason P. Slaine	Director
/s/ Matthew Walsh Matthew Walsh	Director

/s/ Ethan Waxman Ethan Waxman	Director
/s/ Cynthia Collins Cynthia Collins	Director
/s/ Nancy Killefer Nancy Killefer	Director
/s/ Carol Gallagher Carol Gallagher	Director

Exhibit 4.2

Description of Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934

Description of Capital Stock

As of December 31, 2020, Certara, Inc., a Delaware corporation (the "Company," "we," "our," or "us"), had one class of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended: common stock, par value $0.01 per share. The following summary includes a brief description of the common stock, as well as certain related additional information. The summary is not complete and is qualified in its entirety by reference to our amended and restated certificate of incorporation and amended and restated bylaws, which are filed as exhibits to this Annual Report on Form 10-K and are incorporated by reference herein.

Capitalization

Pursuant to our amended and restated certificate of incorporation, our authorized capital stock consists of (i) 600,000,000 shares of common stock, par value $0.01 per share, and (ii) 50,000,000 shares of preferred stock, par value $0.01 per share.

Common Stock

Holders of our common stock are entitled to one vote for each share held of record on all matters on which stockholders are entitled to vote generally, including the election or removal of directors. The holders of our common stock do not have cumulative voting rights in the election of directors.

Preferred Stock

Our amended and restated certificate of incorporation authorizes our board of directors to establish one or more series of preferred stock (including convertible preferred stock). Unless required by law or by the rules of the Nasdaq Global Select Market, the authorized shares of preferred stock are available for issuance without further action by holders of our common stock, and holders of our common stock are not entitled to vote on any amendment to our amended and restated certificate of incorporation that relates solely to the terms of any outstanding shares of preferred stock, if the holders of such shares of preferred stock are entitled to vote thereon. Our board of directors is authorized to determine, with respect to any series of preferred stock, the powers (including voting powers), preferences and relative, participating, optional and other special rights, and the qualifications, limitations or restrictions thereof as the board of directors may from time to time determine, which could affect the relative voting power or other rights of the holders of our common stock.

We could issue a series of preferred stock that could, depending on the terms of the series, impede or discourage an acquisition attempt or other transaction that some, or a majority, of the holders of our common stock might believe to be in their best interests or in which the holders of our common stock might receive a premium for their common stock over the market price of the common stock. Additionally, the issuance of preferred stock may adversely affect the holders of our common stock, including, without limitation, by restricting dividends on the common stock, diluting the voting power of the common stock or subordinating the liquidation rights of the common stock. As a result of these or other factors, the issuance of preferred stock could have an adverse impact on the market price of our common stock.

Liquidation Rights

Upon our liquidation, dissolution or winding up and after payment in full of all amounts required to be paid to creditors and subject to the rights of the holders of one or more outstanding series of preferred stock having liquidation preferences, if any, the holders of our common stock are entitled to receive pro rata our remaining assets available for distribution. Holders of our common stock do not have preemptive, subscription, redemption sinking fund or conversion rights. The common stock is not subject to further calls or assessment by us. All shares of our common stock outstanding are fully paid and non-assessable. The rights, powers, preferences and privileges of

holders of our common stock are subject to those of the holders of any shares of our preferred stock or any series or class of stock we may authorize and issue in the future.

Dividend Rights

Holders of our common stock are entitled to receive dividends when, as and if declared by our board of directors out of funds legally available therefor, subject to any statutory or contractual restrictions on the payment of dividends and to the rights of the holders or one or more outstanding series of our preferred stock.

Other Rights

Our common stock has no conversion rights, sinking fund provisions, redemption provisions or preemptive rights.

Certain Anti-Takeover Effects

Certain provisions of the Delaware General Corporation Law ("DGCL"), our amended and restated certificate of incorporation and our amended and restated bylaws summarized in the paragraphs above and in the following paragraphs may have an anti-takeover effect, especially with respect to certain rights held by that certain stockholder which is an investment fund affiliated with EQT AB ("EQT"). In other words, such provisions could delay, defer or prevent a tender offer or takeover attempt that a stockholder might consider in its best interests, including those attempts that might result in a premium over the market price for the shares held by such stockholder.

Authorized but Unissued Capital Stock

Our board of directors may generally issue one or more series of preferred shares on terms that could discourage, delay or prevent a change of control of our company or the removal of our management.

Classified Board of Directors

Our amended and restated certificate of incorporation provides that, subject to the right of holders of any series of preferred stock, our board of directors will be divided into three classes of directors, with the classes to be as nearly equal in number as possible, and with the directors serving staggered three-year terms, with only one class of directors being elected at each annual meeting of stockholders. As a result, approximately one-third of our board of directors will be elected each year.

Our amended and restated certificate of incorporation and amended and restated bylaws provide that, subject to any rights of holders of preferred stock to elect additional directors under specified circumstances, the number of directors will be fixed from time to time exclusively pursuant to a resolution adopted by the board of directors; however, if at any time EQT owns at least 40% in voting power of the stock of our Company entitled to vote generally in the election of directors, the stockholders may also fix the number of directors.

On the date of the filing of this Annual Report on Form 10-K, EQT owned 49% in voting power of the stock of our Company entitled to vote generally in the election of directors.

Removal of Directors; Vacancies

Our amended and restated certificate of incorporation provides that, other than directors elected by holders of our preferred stock, if any, directors may be removed with or without cause upon the affirmative vote of a majority in voting power of all outstanding shares of stock entitled to vote thereon, voting together as a single class; provided, however, at any time when EQT beneficially owns less than 40% in voting power of the stock of our company entitled to vote generally in the election of directors, directors may only be removed for cause, and only by the affirmative vote of holders of at least 66 2/3% in voting power of all the then-outstanding shares of stock of our company entitled to vote thereon, voting together as a single class.

In addition, our amended and restated certificate of incorporation provides that, subject to the rights granted to one or more series of preferred stock then outstanding, any newly created directorship on the board of directors that results from an increase in the number of directors and any vacancies on our board of directors will be filled only by the affirmative vote of a majority of the remaining directors, even if less than a quorum, or by a sole

remaining director or by the stockholders; provided, however, at any time when EQT beneficially owns less than 40% in voting power of the stock of our company entitled to vote generally in the election of directors, any newly created directorship on the board of directors that results from an increase in the number of directors and any vacancy occurring in the board of directors may only be filled by a majority of the directors then in office, although less than a quorum, or by a sole remaining director (and not by the stockholders). Our amended and restated certificate of incorporation provides that the board of directors may increase the number of directors by the affirmative vote of a majority of the directors or, at any time when EQT beneficially owns at least 40% of the voting power of the stock of our Company entitled to vote generally in the election of directors, of the stockholders.

Business Combinations

We have opted out of Section 203 of the DGCL; however, our amended and restated certificate of incorporation contains similar provisions providing that we may not engage in certain "business combinations" with any "interested stockholder" for a three-year period following the time that the stockholder became an interested stockholder, unless:

- prior to such time, our board of directors approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder;

- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of our voting stock outstanding at the time the transaction commenced, excluding certain shares;

- at or subsequent to that time, the business combination is approved by our board of directors and by the affirmative vote of holders of at least 66 2/3% of our outstanding voting stock that is not owned by the interested stockholder; or

- the stockholder became an interested stockholder inadvertently and (i) as soon as practicable divested itself of sufficient ownership to cease to be an interested stockholder and (ii) had not been an interested stockholder but for the inadvertent acquisition of ownership within three years of the business combination.

Generally, a "business combination" includes a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. Subject to certain exceptions, an "interested stockholder" is a person who, together with that person's affiliates and associates, owns, or within the previous three years owned, 15% or more of our outstanding voting stock. For purposes of this section only, "voting stock" has the meaning given to it in Section 203 of the DGCL.

Our amended and restated certificate of incorporation provides that EQT, and any of its direct or indirect transferees and any group as to which such persons or entities are a party, does not constitute an "interested stockholder" for purposes of this provision.

No Cumulative Voting

Our amended and restated certificate of incorporation does not authorize cumulative voting.

Special Stockholder Meetings

Our amended and restated certificate of incorporation provides that special meetings of our stockholders may be called at any time only by or at the direction of the board of directors or the chairman of the board of directors; provided, however, at any time when EQT beneficially owns, in the aggregate, at least 40% in voting power of the stock of our company entitled to vote generally in the election of directors, special meetings of our stockholders shall also be called by the board of directors or the chairman of the board of directors at the request of EQT. Our amended and restated bylaws prohibit the conduct of any business at a special meeting other than as specified in the notice for such meeting.

Requirements for Advance Notification of Director Nominations and Stockholder Proposals

Our amended and restated bylaws establish advance notice procedures with respect to stockholder proposals and the nomination of candidates for election as directors, other than nominations made by or at the direction of the board of directors or a committee of the board of directors.

Stockholder Action by Written Consent

Our amended and restated certificate of incorporation precludes stockholder action by written consent at any time when EQT beneficially owns less than 40% in voting power of the stock of our Company entitled to vote generally in the election of directors, other than certain rights that holders of our preferred stock may have to act by written consent.

Supermajority Provisions

Our amended and restated certificate of incorporation and amended and restated bylaws provide that the board of directors is expressly authorized to make, alter, amend, change, add to, rescind or repeal, in whole or in part, our amended and restated bylaws without a stockholder vote in any matter not inconsistent with Delaware law or our amended and restated certificate of incorporation. In addition, for as long as EQT beneficially owns at least 40% in voting power of the stock of our company entitled to vote generally in the election of directors, any amendment, alteration, rescission or repeal of our bylaws by our stockholders requires the affirmative vote of a majority in voting power of the outstanding shares of our stock present in person or represented by proxy at the meeting of stockholders and entitled to vote on such amendment, alteration, change, addition, rescission, change, addition or repeal.

Our amended and restated certificate of incorporation provides that at any time when EQT beneficially owns less than 40% in voting power of the stock of our Company entitled to vote generally in the election of directors, certain provisions in our amended and restated certificate of incorporation may be amended, altered, repealed or rescinded only by the affirmative vote of the holders of at least 66 2/3% in voting power of all the then-outstanding shares of stock of our company entitled to vote thereon, voting together as a single class.

Exclusive Forum

Our amended and restated certificate of incorporation provides that unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall, to the fullest extent permitted by law, be the sole and exclusive forum for any (i) derivative action or proceeding brought on behalf of our company, (ii) action asserting a claim of breach of a fiduciary duty owed by any current or former director, officer, employee or stockholder of our company to our company or our company's stockholders, (iii) action asserting a claim against our company or any current or former director, officer, employee or stockholder of our company arising pursuant to any provision of the DGCL or our amended and restated certificate of incorporation or our amended and restated bylaws (as either may be amended from time to time) or (iv) action asserting a claim governed by the internal affairs doctrine of the State of Delaware. However, it is possible that a court could find our forum selection provisions to be inapplicable or unenforceable.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Broadridge Corporate Issuer Solutions, Inc.

Nasdaq Listing

Our common stock is listed on The Nasdaq Global Select Market under the symbol "CERT."

Exhibit 10.2

AMENDED AND RESTATED

REGISTRATION RIGHTS AGREEMENT

BY AND AMONG

CERTARA, INC.

AND

THE PARTIES HERETO

Dated as of December 10, 2020

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REGISTRATION RIGHTS AGREEMENT

This Amended and Restated Registration Rights Agreement (the "Agreement") is made and entered into as of December 10, 2020, by and among the Company (as defined herein), the Institutional Investors (as defined herein) set forth on Schedule A hereto, the Holders (as defined herein) set forth on Schedule B hereto and any other Person (as defined herein) who becomes a party hereto from time to time in accordance with this Agreement.

WITNESSETH:

WHEREAS, the Company, the Institutional Investors and certain other persons entered into a Registration Rights Agreement, dated as of August 15, 2017 (as may be amended, restated or supplemented from time to time but not as of or after the date of this Agreement, the "Original Registration Rights Agreement");

WHEREAS, pursuant to section 3.06 of the Original Registration Rights Agreement, the Company and the Institutional Investors are entering into this Amended and Restated Registration Rights Agreement to amend and restate the Original Registration Rights Agreement so as to set forth certain registration rights applicable to the Registrable Securities (as defined below) on the terms and conditions set forth herein; and

WHEREAS, in accordance with the terms of the A&R Limited Partnership Agreement (as defined below), all outstanding interests in the Partnership (as defined below), other than those interests held by the Institutional Investors in their capacity as Partners (as defined in the Partnership Agreement), were exchanged for Company Shares (as defined below).

NOW, THEREFORE, in consideration of the foregoing and the mutual promises, covenants and agreements of the parties hereto, and for other good and valuable consideration the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

ARTICLE I

DEFINITIONS

SECTION 1.01. Defined Terms. As used in this Agreement, the following terms shall have the following meanings:

"A&R Limited Partnership Agreement" means the Amended and Restated Limited Partnership Agreement of the Partnership, dated as of August 15, 2017, as amended, restated, supplemented or otherwise modified from time to time, by and among EQT Avatar Parent GP LLC, as general partner, and the additional parties thereto from time to time.

"Acceptable Holders" means, individually or collectively, EQT and their respective Permitted Assignees and Affiliates.

"Adverse Disclosure" means public disclosure of material non-public information that, in the Board of Directors' good faith judgment, after consultation with independent outside counsel to the Company, would be required to be made in any Registration Statement filed with the SEC by the Company so that such Registration Statement would not contain any untrue statement of material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not materially misleading and would not be required to be made at such time but for the filing, effectiveness

or use of such Registration Statement, but which information the Company has a bona fide, material business purpose for not disclosing publicly.

"Affiliate" has the meaning specified in Rule 12b-2 under the Exchange Act; provided, that no Holder shall be deemed an Affiliate of the Company or its Subsidiaries for purposes of this Agreement; provided, further, that neither portfolio companies (as such term is commonly used in the private equity industry) of EQT or any of their Investment Fund Affiliates nor limited partners, non-managing members or other similar direct or indirect third party investors in EQT or any of their Investment Fund Affiliates shall be deemed to be Affiliates of any Institutional Investor. The term "Affiliated" has a correlative meaning.

"Agreement" has the meaning set forth in the preamble.

"Arsenal Investors" has the meaning set forth in the Stockholders Agreement.

"Board of Directors" means the board of directors of the Company.

"Business Day" means any day other than a Saturday, Sunday or a day on which commercial banks located in New York, New York are required or authorized by law or executive order to be closed.

"Change of Control" means (a) the sale or disposition, in one or a series of related transactions, of all or substantially all of the assets of the Company and its Subsidiaries on a consolidated basis as determined under section 271 of the Delaware General Corporation Law, to any "person" or "group" (as defined in section 13(d)(3) of the Exchange Act) (excluding the Acceptable Holders) or (b) any person or group (excluding the Acceptable Holders) is or becomes the "beneficial owner" (as defined in Rules 13d-3 and 13d-5 under the Exchange Act), directly or indirectly, of more than 50% of the total voting power of the voting stock of the Company (a "Sale of Control") and, following such Sale of Control, the Acceptable Holders cease to have the right to designate a majority of the members of the Board of the Company; provided, however, notwithstanding anything to the contrary in this definition or any provision of the Exchange Act, including section 13(d)-3 or 13(d)-5 of the Exchange Act and Rules 13d-3 and 13d-5 under the Exchange Act, (A) if any such person or group includes one or more Acceptable Holders, the issued and outstanding Company Shares and Company Share Equivalents that are directly or indirectly owned by the Acceptable Holders that are part of such person or group shall not be treated as being beneficially owned by such person or group or any other member of such group for purposes of this definition, (B) such person or group shall not be deemed to beneficially own Company Shares and Company Share Equivalents to be acquired by such person or group pursuant to a stock or asset purchase agreement, merger agreement, option agreement, warrant agreement or similar agreement (or voting or option or similar agreement related thereto) until the consummation of the acquisition of Company Shares and Company Share Equivalents in connection with the transactions contemplated by such agreement and (C) such person or group will not be deemed to beneficially own Company Shares and Company Share Equivalents of another Person as a result of its ownership of capital stock or other securities of such other Person or such Person's parent (or related contractual rights) unless it owns 50% or more of the total voting power of the capital stock or other securities entitled to vote for the election of directors or similar governing body of such Person or such Person's parent.

"Company" means Certara, Inc., a Delaware corporation, and any successors and assigns thereof.

"Company Public Sale" means any offering of the Company's equity securities for its own account or for the account of any other Person(s).

"Company Share Equivalent" means securities exercisable, exchangeable or convertible into Company Shares.

"Company Shares" means the shares of voting common stock of the Company, any securities into which such shares of voting common stock shall have been changed, or any securities resulting from any reclassification, recapitalization or similar transactions.

"Demand Company Notice" has the meaning set forth in Section 2.01(c).

"Demand Notice" has the meaning set forth in Section 2.01(a).

"Demand Registration" has the meaning set forth in Section 2.01(a).

"Demand Registration Statement" has the meaning set forth in Section 2.01(a).

"Demand Suspension" has the meaning set forth in Section 2.01(d).

"Eligibility Notice" has the meaning set forth in Section 2.02(a)(i).

"EQT" means EQT Avatar Parent L.P., a Delaware limited partnership, and any successors and assigns thereof.

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and any successor thereto, and any rules and regulations promulgated thereunder, all as the same shall be in effect from time to time.

"Excluded Holder" means any Holder that is a former officer, director, employee or consultant of the Company or any of its Subsidiaries as of the applicable date of determination.

"FINRA" means the U.S. Financial Industry Regulatory Authority.

"Form S-1" means a registration statement on Form S-1 under the Securities Act, or any comparable or successor form or forms thereto.

"Form S-3" means a registration statement on Form S-3 under the Securities Act, or any comparable or successor form or forms thereto.

"Form S-4" means a registration statement on Form S-4 under the Securities Act, or any comparable or successor form or forms thereto.

"Form S-8" means a registration statement on Form S-8 under the Securities Act, or any comparable or successor form or forms thereto.

"Holder" means any holder of Registrable Securities that is a party hereto or that succeeds to rights hereunder pursuant to Section 3.07.

"Impacted Holder" has the meaning set forth in Section 3.06.

"Institutional Investors" means EQT and their respective Affiliates that are direct or indirect equity investors in the Company and any Permitted Assignee thereof that becomes a party hereto as an Institutional Investor, together with each of their respective successors.

"Investment Fund" means, collectively, (x) a private equity or other investment fund that (A) makes investments in multiple portfolio companies and was not formed primarily to invest in the Company or its Subsidiaries or (B) is an alternative investment vehicle for a fund described in clause (A) and (y) any Person directly or indirectly wholly-owned by any private equity or other investment fund (or group of Affiliated private equity or other investment funds) described in clause (x) and/or any general partner or managing member who is an Affiliate thereof.

"IPO" means (i) the first registered initial public offering in the United States or foreign jurisdiction of the equity securities of the Company or any entity into which the equity securities of the Company may be converted in connection with such offering, pursuant to an effective registration statement under the Securities Act (other than a registration statement on Forms S-4 or S-8 or any similar form) or pursuant to other applicable foreign laws or (ii) the date of effectiveness of a registration of a class of securities of the Company or any entity into which the securities of the Company may be converted in connection with such registration under the Exchange Act to be traded on a national securities exchange that has registered with the SEC under section 6 of the Exchange Act; provided, that, for the avoidance of doubt, the closing contemplated by a registration statement on Form S-1 publicly filed by the Company with the SEC shall constitute an IPO.

"Issuer Free Writing Prospectus" means an issuer free writing prospectus, as defined in Rule 433 under the Securities Act, relating to an offer of Registrable Securities.

"Long-Form Registration" has the meaning set forth in Section 2.01(a).

"Loss" or "Losses" has the meaning set forth in Section 2.09(a).

"Majority Impacted Holders" means the Impacted Holders holding a majority of the Registrable Securities held by all Impacted Holders as of the applicable date of determination.

"Marketed Underwritten Offering" means any Underwritten Offering (including a Marketed Underwritten Shelf Take-Down, but, for the avoidance of doubt, not including any Shelf Take-Down that is not a Marketed Underwritten Shelf Take-Down) that involves a customary "road show" (including an "electronic road show") or other substantial marketing effort by the Company and the underwriters over a period of at least 48 hours.

"Marketed Underwritten Shelf Take-Down" has the meaning set forth in Section 2.02(e)(iii).

"Marketed Underwritten Shelf Take-Down Notice" has the meaning set forth in Section 2.02(e)(iii).

"Participating Holder" means, with respect to any Registration, any Holder of Registrable Securities covered by the applicable Registration Statement.

"Partnership" means EQT Avatar Parent L.P., a Delaware limited partnership, and any successors and assigns thereof.

"Permitted Assignee" has the meaning set forth in Section 3.07(a).

"Person" means any individual, partnership, corporation, limited liability company, unincorporated organization, trust or joint venture, or a governmental agency or political subdivision thereof or any other entity.

"Piggyback Registration" has the meaning set forth in Section 2.03(a).

"Prospectus" means the prospectus included in any Registration Statement, all amendments and supplements to such prospectus, including pre- and post-effective amendments to such Registration Statement, and all other material incorporated by reference in such prospectus.

"Registrable Securities" means any Company Shares and any securities that may be issued or distributed or be issuable or distributable in respect of, or in substitution for, any Company Shares by way of conversion, exercise, dividend, stock split or other distribution, merger, consolidation, exchange, recapitalization or reclassification or similar transaction, in each case whether now owned or hereinafter acquired; provided, however, that any such Registrable Securities shall cease to be Registrable Securities to the extent (i) a Registration Statement with respect to the sale of such Registrable Securities has been declared effective under the Securities Act and such Registrable Securities have been disposed of in accordance with the plan of distribution set forth in such Registration Statement, (ii) such Registrable Securities have been distributed pursuant to Rule 144 or Rule 145 of the Securities Act (or any successor rule or other exemption from the registration requirements of the Securities Act), (iii) a Registration Statement on Form S-8 (or any successor form) covering the resale of such securities is effective, (iv) such security ceases to be outstanding or (v) when a Holder (other than the Institutional Investors or any of their respective Affiliates) is able to dispose of such Registrable Securities held by it pursuant to Rule 144 under the Securities Act without any limitation. For the avoidance of doubt, it is understood that, (i) with respect to any Registrable Securities that are subject to vesting conditions, all vesting conditions must be satisfied and such Registrable Securities vested prior to the exercise of any registration rights with respect to such Registrable Securities pursuant to this Agreement and/or sale of such Registrable Securities, (ii) with respect to any Registrable Securities for which a Holder holds vested but unexercised options or other Company Share Equivalents at such time exercisable for, convertible into or exchangeable for Company Shares, to the extent that such Registrable Securities are to be sold under a registration statement pursuant to this Agreement, such Holder must exercise the relevant option or exercise, convert or exchange such other relevant Company Share Equivalent and agree to transfer the underlying Registrable Securities (in each case, net of any amounts required to be withheld by the Company in connection with such exercise).

"Registration" means a registration with the SEC of the Company's securities for offer and sale to the public under a Registration Statement. The terms "Register" and "Registered" shall have correlative meanings.

"Registration Expenses" has the meaning set forth in Section 2.08.

"Registration Statement" means any registration statement of the Company that covers Registrable Securities pursuant to the provisions of this Agreement filed with, or to be filed with, the SEC under the rules and regulations promulgated under the Securities Act, including any related Prospectus, amendments and supplements to such registration statement, including pre- and post-effective amendments, and all exhibits and all material incorporated by reference in such registration statement.

"Representatives" means, with respect to any Person, any of such Person's officers, directors, employees, agents, attorneys, accountants, actuaries, consultants, equity financing partners or financial advisors or other Person associated with, or acting on behalf of, such Person.

"Rule 144" means Rule 144 (or any successor provisions) under the Securities Act.

"S-3 Eligibility Date" has the meaning set forth in Section 2.02(a)(i).

"S-3 Shelf Notice" has the meaning set forth in Section 2.02(a)(i).

"SEC" means the Securities and Exchange Commission.

"Securities Act" means the Securities Act of 1933, as amended, and any successor thereto, and any rules and regulations promulgated thereunder, all as the same shall be in effect from time to time.

"Shelf Holder" has the meaning set forth in Section 2.02(c).

"Shelf Notice" has the meaning set forth in Section 2.02(a)(ii).

"Shelf Period" has the meaning set forth in Section 2.02(b).

"Shelf Registration" means a Registration effected pursuant to Section 2.02.

"Shelf Registration Statement" means a Registration Statement of the Company filed with the SEC on either (i) Form S-3 (or any successor or similar short-form registration statement) or (ii) if the Company is not permitted to file a Registration Statement on Form S-3, a Registration Statement on Form S-1 (or any successor or similar registration statement), in each case for an offering to be made on a delayed or continuous basis pursuant to Rule 415 under the Securities Act (or any successor provision) covering all or any portion of the Registrable Securities, as applicable.

"Shelf Suspension" has the meaning set forth in Section 2.02(d).

"Shelf Take-Down" has the meaning set forth in Section 2.02(e)(i).

"Short-Form Registration" has the meaning set forth in Section 2.01(a).

"Special Registration" has the meaning set forth in Section 2.12.

"Stockholders Agreement" means the Stockholders Agreement of the Company, dated as of December 10, 2020, by and among the EQT Stockholders (as defined therein), the Arsenal Stockholders (as defined therein) and the additional parties thereto from time to time, as amended, restated, supplemented or otherwise modified from time to time.

"Subsidiary" means, with respect to any Person, any entity of which (i) a majority of the total voting power of shares of stock or equivalent ownership interests entitled (without regard to the occurrence of any contingency) to vote in the election of directors, managers, trustees or other members of the applicable governing body thereof is at the time owned or controlled, directly or indirectly, by that Person or one or more of the Subsidiaries of that Person or a combination thereof, or (ii) if no such governing body exists at such entity, a majority of the total voting power of shares of stock or equivalent ownership interests of the entity is at the time owned or controlled, directly or indirectly, by that Person or one or more Subsidiaries of that Person or a combination thereof. For purposes hereof, a Person or Persons shall be deemed to have a majority ownership interest in a limited liability company, company, association or other business entity if such Person or Persons shall be allocated a majority of limited liability company, company, association or other business entity gains or losses or is (or controls) the managing member or general partner of such limited liability company, company, association or other business entity.

"Underwritten Offering" means a Registration in which securities of the Company are sold to an underwriter or underwriters on a firm commitment basis for reoffering to the public.

"Underwritten Shelf Take-Down Notice" has the meaning set forth in Section 2.02(e)(ii).

SECTION 1.02. Other Interpretive Provisions. (a) In this Agreement, except as otherwise provided:

(i) A reference to an Article, Section, Schedule or Exhibit is a reference to an Article or Section of, or Schedule or Exhibit to, this Agreement, and references to this Agreement include any recital in or Schedule or Exhibit to this Agreement.

(ii) The Schedules and Exhibits form an integral part of and are hereby incorporated by reference into this Agreement.

(iii) Headings and the Table of Contents are inserted for convenience only and shall not affect the construction or interpretation of this Agreement.

(iv) Unless the context otherwise requires, words importing the singular include the plural and vice versa, words importing the masculine include the feminine and vice versa, and words importing persons include corporations, associations, partnerships, joint ventures and limited liability companies and vice versa.

(v) Unless the context otherwise requires, the words "hereof" and "herein", and words of similar meaning refer to this Agreement as a whole and not to any particular Article, Section or clause. The words "include", "includes" and "including" shall be deemed to be followed by the words "without limitation."

(vi) A reference to any legislation or to any provision of any legislation shall include any amendment, modification or re-enactment thereof and any legislative provision substituted therefor.

(vii) All determinations to be made by the Institutional Investors hereunder shall be made by the Institutional Investors in their sole discretion, and the Institutional Investors may determine, in their sole discretion, whether or not to take actions that are permitted, but not required, by this Agreement to be taken by the Institutional Investors, including the giving of consents required hereunder.

(b) The parties hereto have participated jointly in the negotiation and drafting of this Agreement. In the event an ambiguity or question of intention or interpretation arises, this Agreement shall be construed as if drafted jointly by the parties hereto, and no presumption or burden of proof shall arise favoring or disfavoring any party by virtue of the authorship of any provisions of this Agreement.

ARTICLE II

REGISTRATION RIGHTS

SECTION 2.01. Demand Registration.

(a) Demand by Institutional Investors. At any time, the Institutional Investors may, subject to Section 2.11, make a written request (a "Demand Notice") to the Company for Registration of all or part of the Registrable Securities held by the Institutional Investors (i) on Form S-1 (a "Long-Form Registration") or (ii) on Form S-3 (a "Short-Form Registration") if the Company qualifies to use such short form (any such requested Long-Form Registration or Short-Form Registration,

a "Demand Registration"). Each Demand Notice shall specify the aggregate amount of Registrable Securities of the Institutional Investors to be registered and the intended methods of disposition thereof. Subject to Section 2.11, after delivery of such Demand Notice, the Company (x) shall file promptly (and, in any event, within (i) ninety (90) days in the case of a request for a Long-Form Registration or (ii) thirty (30) days in the case of a request for a Short-Form Registration, in each case, following delivery of such Demand Notice) with the SEC a Registration Statement (which the Company shall designate as an automatically effective Registration Statement if the Company qualifies at such time to file such a Registration Statement) relating to such Demand Registration (a "Demand Registration Statement"), and (y) shall use its reasonable best efforts to cause such Demand Registration Statement to promptly be declared effective under (x) the Securities Act (if such Registration Statement is not automatically effective) and (y) the "Blue Sky" laws of such jurisdictions as any Participating Holder or any underwriter, if any, reasonably requests.

(b) Demand Withdrawal. The Institutional Investors may withdraw their Registrable Securities from a Demand Registration at any time prior to the effectiveness of the applicable Demand Registration Statement. Upon delivery of a notice by the Institutional Investors to such effect, the Company shall cease all efforts to secure effectiveness of the applicable Demand Registration Statement. For the avoidance of doubt, the Institutional Investors shall not have any liability or obligation to any other Holder following their determination to terminate, withdraw and/or delay any Demand Registration initiated by them under this Section 2.01.

(c) Demand Company Notice. Subject to Section 2.11, promptly upon delivery of any Demand Notice (but in no event more than five (5) Business Days following delivery of such Demand Notice), the Company shall deliver a written notice (a "Demand Company Notice") of any such Registration request to all Holders (other than the Institutional Investors), and the Company shall include in such Demand Registration all such Registrable Securities of such Holders which the Company has received written requests for inclusion therein within ten (10) Business Days after the date that such Demand Company Notice has been delivered. All requests made pursuant to this Section 2.01(c) shall specify the aggregate amount of Registrable Securities of such Holder to be registered.

(d) Delay in Filing; Suspension of Registration. If the Company shall furnish to the Participating Holders a certificate signed by the Chief Executive Officer or equivalent senior executive officer of the Company stating that the filing, effectiveness or continued use of a Demand Registration Statement would require the Company to make an Adverse Disclosure, then the Company may delay the filing (but not the preparation of) or initial effectiveness of, or suspend use of, the Demand Registration Statement (a "Demand Suspension"); provided, however, that the Company, unless otherwise approved in writing by the Institutional Investors, shall not be permitted to exercise aggregate Demand Suspensions and Shelf Suspensions more than twice, or for more than an aggregate of sixty (60) days, in each case, during any twelve (12) month period; provided, further, that in the event of a Demand Suspension, such Demand Suspension shall terminate at such earlier time as the Company would no longer be required to make any Adverse Disclosure. Each Participating Holder shall keep confidential the fact that a Demand Suspension is in effect, the certificate referred to above and its contents unless and until otherwise notified by the Company, except (A) for disclosure to such Participating Holder's employees, agents and professional advisers who reasonably need to know such information for purposes of assisting the Participating Holder with respect to its investment in the Company Shares and agree to keep it confidential, (B) for disclosures to the extent required in order to comply with reporting obligations to its limited partners or other direct or indirect investors who have agreed to keep such information confidential, (C) if and to the extent such matters are publicly disclosed by the Company or any of its Subsidiaries or any other Person that, to the actual knowledge of such Participating Holder, was not subject to an obligation or duty of confidentiality to the Company and its Subsidiaries, (D) as required by law, rule or regulation, (E) for disclosures to potential limited partners or investors of a Participating

Holder who have agreed to keep such information confidential and (F) for disclosures to potential transferees of a Holder's Registrable Securities who have agreed to keep such information confidential. In the case of a Demand Suspension, the Participating Holders agree to suspend use of the applicable Prospectus and any Issuer Free Writing Prospectus in connection with any sale or purchase of, or offer to sell or purchase, Registrable Securities, upon delivery of the notice referred to above. The Company shall immediately notify the Participating Holders upon the termination of any Demand Suspension, and (i) in the case of a Demand Registration Statement that has not been declared effective, shall promptly thereafter file the Demand Registration Statement and use its reasonable best efforts to have such Demand Registration Statement declared effective under the Securities Act and (ii) in the case of an effective Demand Registration Statement, shall amend or supplement the Prospectus and any Issuer Free Writing Prospectus, if necessary, so it does not contain any untrue statement or omission and furnish to the Participating Holders such numbers of copies of the Prospectus and any Issuer Free Writing Prospectus as so amended or supplemented as the Participating Holders may reasonably request. The Company agrees, if necessary, to supplement or make amendments to the Demand Registration Statement if required by the registration form used by the Company for the applicable Registration or by the instructions applicable to such registration form or by the Securities Act, or as may reasonably be requested by the Institutional Investors.

(e) Underwritten Offering. If the Institutional Investors so request, an offering of Registrable Securities pursuant to a Demand Registration shall be in the form of an Underwritten Offering, and the Institutional Investors shall have the right to select the managing underwriter or underwriters to administer the offering. If the Institutional Investors intend to sell the Registrable Securities covered by their demand by means of an Underwritten Offering, the Institutional Investors shall so advise the Company as part of its Demand Notice, and the Company shall include such information in the Demand Company Notice.

(f) Priority of Securities Registered Pursuant to Demand Registrations. If the managing underwriter or underwriters of a proposed Underwritten Offering of the Registrable Securities included in a Demand Registration advise the Board of Directors in writing (with a copy provided to the Institutional Investors requesting participation in such Demand Registration) that, in its or their opinion, the number of securities requested to be included in such Demand Registration exceeds the number which can be sold in such offering without being likely to have a significant adverse effect on the price, timing or distribution of the securities offered or the market for the securities offered, the securities to be included in such Demand Registration (i) first, shall be allocated pro rata among the Holders that have requested to participate in such Demand Registration based on the relative number of Registrable Securities then held by each such Holder (provided, that any securities thereby allocated to a Holder that exceed such Holder's request shall be reallocated among the remaining requesting Holders in like manner), (ii) second, and only if all the securities referred to in clause (i) have been included in such Registration, the number of securities that the Company proposes to include in such Registration that, in the opinion of the managing underwriter or underwriters, can be sold without having such adverse effect and (iii) third, and only if all of the securities referred to in clause (ii) have been included in such Registration, any other securities eligible for inclusion in such Registration that, in the opinion of the managing underwriter or underwriters, can be sold without having such adverse effect.

SECTION 2.02. Shelf Registration.

(a) Filing.

(i) Following the IPO, the Company shall use its reasonable best efforts to qualify for Registration on Form S-3 for secondary sales. Promptly following the date on which the Company becomes eligible to Register on Form S-3 (the "S-3 Eligibility Date"), the Company

shall notify, in writing, the Institutional Investors of such eligibility and its intention to file and maintain a Shelf Registration Statement on Form S-3 covering the Registrable Securities held by the Institutional Investors (the "Eligibility Notice"). Promptly following receipt of such Eligibility Notice (but in no event more than ten (10) days after receipt of such Eligibility Notice), the Institutional Investors shall deliver a written notice to the Company, which notice shall specify the aggregate amount of Registrable Securities held by the Institutional Investors to be covered by such Shelf Registration Statement and the intended methods of distribution thereof (the "S-3 Shelf Notice"). Following delivery of the S-3 Shelf Notice, the Company (x) shall file promptly (and, in any event, within the earlier of (i) thirty (30) days of receipt of the S-3 Shelf Notice and (ii) forty (40) days after delivery of the Eligibility Notice) with the SEC such Shelf Registration Statement (which shall be an automatic Shelf Registration Statement if the Company qualifies at such time to file such a Shelf Registration Statement) relating to the offer and sale of all Registrable Securities requested for inclusion therein by the Institutional Investors and, to the extent requested under Section 2.02(c), the other Holders from time to time in accordance with the methods of distribution elected by such Holders (to the extent permitted in this Section 2.02) and set forth in the Shelf Registration Statement and (y) shall use its reasonable best efforts to cause such Shelf Registration Statement to be promptly declared effective under the Securities Act (including upon the filing thereof if the Company qualifies to file an automatic Shelf Registration Statement); provided, however, that if the Institutional Investors reasonably believe that the Company will become S-3 eligible and delivers a S-3 Shelf Notice following the IPO but prior to the S-3 Eligibility Date, the Company shall not be obligated to file (but shall be obligated to prepare) such Shelf Registration Statement on Form S-3.

(ii) Subject to the right to deliver a Shelf Notice in the manner contemplated by the first proviso below, at any time following the first anniversary of the IPO, to the extent that the Company is not eligible to file or maintain a Shelf Registration Statement on Form S-3 as contemplated by Section 2.02(a)(i), the Institutional Investors may, subject to Section 2.11, make a written request to the Company to file a Shelf Registration Statement on Form S-1 (a "Shelf Notice"), which Shelf Notice shall specify the aggregate amount of Registrable Securities of the Institutional Investors to be registered therein and the intended methods of distribution thereof. Following the delivery of a Shelf Notice, the Company (x) shall file promptly (and, in any event, within ninety (90) days following delivery of such Shelf Notice) with the SEC such Shelf Registration Statement relating to the offer and sale of all Registrable Securities requested for inclusion therein by the Institutional Investors and, to the extent requested under Section 2.02(c), the other Holders from time to time in accordance with the methods of distribution elected by such Holders (to the extent permitted in this Section 2.02) and set forth in the Shelf Registration Statement (provided, however, that if a Shelf Notice is delivered prior to the first anniversary of the IPO, the Company shall not be obligated to file (but shall be obligated to prepare) such Shelf Registration Statement prior to the first anniversary of the IPO) and (y) shall use its reasonable best efforts to cause such Shelf Registration Statement to be promptly declared effective under the Securities Act. If, on the date of any such request (or, in the event of a request that is delivered prior to the first anniversary of the IPO, on the date following the first anniversary of the IPO), the Company does not qualify to file a Shelf Registration Statement under the Securities Act, the provisions of this Section 2.02 shall not apply, and the provisions of Section 2.01 shall apply instead.

(b) Continued Effectiveness. The Company shall use its reasonable best efforts to keep any Shelf Registration Statement filed pursuant to Section 2.02(a) continuously effective under the Securities Act in order to permit the Prospectus forming a part thereof to be usable by Shelf Holders until the earliest of (i) the date as of which all Registrable Securities have been sold pursuant to the Shelf Registration Statement or another Registration Statement filed under the Securities Act (but in no event

prior to the applicable period referred to in section 4(a)(3) of the Securities Act and Rule 174 thereunder), (ii) the date as of which each of the Shelf Holders is permitted to sell its Registrable Securities without Registration pursuant to Rule 144 without volume limitation or other restrictions on transfer thereunder and (iii) such shorter period as the Institutional Investors with respect to such Shelf Registration shall agree in writing (such period of effectiveness, the "Shelf Period"). Subject to Section 2.02(d), the Company shall not be deemed to have used its reasonable best efforts to keep the Shelf Registration Statement effective during the Shelf Period if the Company voluntarily takes any action or omits to take any action that would result in Shelf Holders not being able to offer and sell any Registrable Securities pursuant to such Shelf Registration Statement during the Shelf Period, unless such action or omission is (x) a Shelf Suspension permitted pursuant to Section 2.02(d) or (y) required by applicable law, rule or regulation.

(c) Company Notices. Promptly after delivery of a S-3 Shelf Notice or Shelf Notice pursuant to Section 2.02(a) (but in no event more than ten (10) Business Days after delivery of such S-3 Shelf Notice or the Shelf Notice, as applicable), the Company shall deliver a written notice of the S-3 Shelf Notice or the Shelf Notice, as applicable, to all Holders other than the Institutional Investors and the Company shall include in such Shelf Registration all Registrable Securities of such Holders which the Company has received written requests for inclusion therein within ten (10) Business Days after such written notice is delivered to such Holders (each such Holder delivering such a request, together with the Institutional Investors, if applicable, a "Shelf Holder"). If the Company is permitted by applicable law, rule or regulation to add selling stockholders to a Shelf Registration Statement without filing a post-effective amendment, a Holder may request the inclusion of any amount of such Holder's Registrable Securities in such Shelf Registration Statement at any time or from time to time after the filing of a Shelf Registration Statement, and the Company shall add such Registrable Securities to the Shelf Registration Statement as promptly as reasonably practicable, and such Holder shall be deemed a Shelf Holder.

(d) Delay in Filing; Suspension of Registration. If the Company shall furnish to the Shelf Holders a certificate signed by the Chief Executive Officer or equivalent senior executive officer of the Company stating that the filing, effectiveness or continued use of a Shelf Registration Statement filed pursuant to Section 2.02(a) would require the Company to make an Adverse Disclosure, then the Company may delay the filing (but not the preparation of) or initial effectiveness of, or suspend use of the Shelf Registration Statement (a "Shelf Suspension"); provided, however, that the Company, unless otherwise approved in writing by the Institutional Investors, shall not be permitted to exercise aggregate Demand Suspensions and Shelf Suspensions more than twice, or for more than an aggregate of sixty (60) days, in each case, during any 12-month period; provided, further, that in the event of a Shelf Suspension, such Shelf Suspension shall terminate at such earlier time as the Company would no longer be required to make any Adverse Disclosure. Each Shelf Holder shall keep confidential the fact that a Shelf Suspension is in effect, the certificate referred to above and its contents unless and until otherwise notified by the Company, except (A) for disclosure to such Shelf Holder's employees, agents and professional advisers who reasonably need to know such information for purposes of assisting the Holder with respect to its investment in the Company Shares and agree to keep it confidential, (B) for disclosures to the extent required in order to comply with reporting obligations to its limited partners or other direct or indirect investors who have agreed to keep such information confidential, (C) if and to the extent such matters are publicly disclosed by the Company or any of its Subsidiaries or any other Person that, to the actual knowledge of such Shelf Holder, was not subject to an obligation or duty of confidentiality to the Company and its Subsidiaries, (D) as required by law, rule or regulation, (E) for disclosures to potential limited partners or investors of a Participating Holder who have agreed to keep such information confidential and (F) for disclosures to potential transferees of a Holder's Registrable Securities who have agreed to keep such information confidential. In the case of a Shelf Suspension, the Holders agree to suspend use of the applicable Prospectus and any Issuer Free Writing Prospectus in connection with any

sale or purchase of, or offer to sell or purchase, Registrable Securities, upon delivery of the notice referred to above. The Company shall immediately notify the Shelf Holders upon the termination of any Shelf Suspension, and (i) in the case of a Shelf Registration Statement that has not been declared effective, shall promptly thereafter file the Shelf Registration Statement and use its reasonable best efforts to have such Shelf Registration Statement declared effective under the Securities Act and (ii) in the case of an effective Shelf Registration Statement, shall (x) amend or supplement the Prospectus and any Issuer Free Writing Prospectus, if necessary, so it does not contain any untrue statement or omission and furnish to the Shelf Holders such numbers of copies of the Prospectus and any Issuer Free Writing Prospectus as so amended or supplemented as the Shelf Holders may reasonably request and (y) if applicable, cause any post-effective amendment to the Shelf Registration Statement to become effective. The Company agrees, if necessary, to supplement or make amendments to the Shelf Registration Statement if required by the registration form used by the Company for the applicable Registration or by the instructions applicable to such registration form or by the Securities Act or the rules or regulations promulgated thereunder, or as may reasonably be requested by the Institutional Investors.

(e) Shelf Take-Downs.

(i) An offering or sale of Registrable Securities pursuant to a Shelf Registration Statement (each, a "Shelf Take-Down") may be initiated only by the Institutional Investors. Except as set forth in Section 2.02(e)(iii) with respect to Marketed Underwritten Shelf Take-Downs, the Company shall not be required to permit the offer and sale of Registrable Securities by other Shelf Holders in connection with any such Shelf Take-Down initiated by the Institutional Investors.

(ii) Subject to Section 2.11, if the Institutional Investors elect by written request to the Company, a Shelf Take-Down shall be in the form of an Underwritten Offering (an "Underwritten Shelf Take-Down Notice") and the Company shall amend or supplement the Shelf Registration Statement for such purpose as soon as practicable. The Institutional Investors shall have the right to select the managing underwriter or underwriters to administer such offering. The provisions of Section 2.01(f) shall apply to any Underwritten Offering pursuant to this Section 2.02(e).

(iii) If the plan of distribution set forth in any Underwritten Shelf Take-Down Notice includes a customary "road show" (including an "electronic road show") or other marketing effort, which may be conducted confidentially, by the Company and the underwriters over a period expected to exceed forty-eight (48) hours (a "Marketed Underwritten Shelf Take-Down"), promptly upon delivery of such Underwritten Shelf Take-Down Notice (but in no event more than three (3) Business Days thereafter), the Company shall promptly deliver a written notice (a "Marketed Underwritten Shelf Take-Down Notice") of such Marketed Underwritten Shelf Take-Down to all Shelf Holders (other than the Institutional Investors), and the Company shall include in such Marketed Underwritten Shelf Take-Down all such Registrable Securities of such Shelf Holders that are Registered on such Shelf Registration Statement for which the Company has received written requests, which requests must specify the aggregate amount of such Registrable Securities of such Holder to be offered and sold pursuant to such Marketed Underwritten Shelf Take-Down, for inclusion therein within three (3) Business Days after the date that such Marketed Underwritten Shelf Take-Down Notice has been delivered.

SECTION 2.03. Piggyback Registration.

(a) Participation. If the Company at any time proposes to file a Registration Statement with respect to any Company Public Sale (other than (i) a Registration Statement proposed to

be filed in connection with the IPO, (ii) a Registration under Section 2.01 or Section 2.02, it being understood that this clause (ii) does not limit the rights of Holders to make written requests pursuant to Sections 2.01 or 2.02 or otherwise limit the applicability thereof, (iii) a Registration Statement on Form S-4 or Form S-8, (iv) a registration of securities solely relating to an offering and sale to employees, directors or consultants of the Company or its Subsidiaries pursuant to any employee stock plan or other employee benefit plan arrangement, (v) a registration not otherwise covered by clause (iii) above pursuant to which the Company is offering to exchange its own securities for other securities, (vi) a Registration Statement relating solely to dividend reinvestment or similar plans or (vii) a Shelf Registration Statement pursuant to which only the initial purchasers and subsequent transferees of debt securities of the Company or any of its Subsidiaries that are convertible or exchangeable for Company Shares and that are initially issued pursuant to Rule 144A and/or Regulation S (or any successor provisions) of the Securities Act may resell such notes and sell the Company Shares into which such notes may be converted or exchanged), then, (A) as soon as practicable (but in no event less than thirty (30) days prior to the proposed date of filing of such Registration Statement), the Company shall give written notice of such proposed filing to the Institutional Investor, and such notice shall offer each Institutional Investor the opportunity to Register under such Registration Statement such number of Registrable Securities as such Institutional Investor may request in writing delivered to the Company within ten (10) days of delivery of such written notice by the Company, and (B) subject to Section 2.03(c), as soon as practicable after the expiration of such ten (10) -day period (but in no event less than fifteen (15) days prior to the proposed date of filing of such Registration Statement), the Company shall give written notice of such proposed filing to the Holders (other than the Institutional Investor), and such notice shall offer each such Holder the opportunity to Register under such Registration Statement such number of Registrable Securities as such Holder may request in writing within ten (10) days of delivery of such written notice by the Company. Subject to Sections 2.03(b) and (c), the Company shall include in such Registration Statement all such Registrable Securities that are requested by Holders to be included therein in compliance with the immediately foregoing sentence (a "Piggyback Registration"); provided, that, if at any time after giving written notice of its intention to Register any equity securities and prior to the effective date of the Registration Statement filed in connection with such Piggyback Registration, the Company shall determine for any reason not to Register or to delay Registration of the equity securities covered by such Piggyback Registration, the Company shall give written notice of such determination to each Holder that had requested to Register its, his or her Registrable Securities in such Registration Statement and, thereupon, (1) in the case of a determination not to Register, shall be relieved of its obligation to Register any Registrable Securities in connection with such Registration (but not from its obligation to pay the Registration Expenses in connection therewith, to the extent payable), without prejudice, however, to the rights of the Institutional Investors to request that such Registration be effected as a Demand Registration under Section 2.01, and (2) in the case of a determination to delay Registering, in the absence of a request by the Institutional Investors to request that such Registration be effected as a Demand Registration under Section 2.01, shall be permitted to delay Registering any Registrable Securities, for the same period as the delay in Registering the other equity securities covered by such Piggyback Registration. If the offering pursuant to such Registration Statement is to be underwritten, the Company shall so advise the Holders as a part of the written notice given pursuant this Section 2.03(a), and each Holder making a request for a Piggyback Registration pursuant to this Section 2.03(a) must, and the Company shall make such arrangements with the managing underwriter or underwriters so that each such Holder may, participate in such Underwritten Offering, subject to the conditions of Section 2.03(b) and (c). If the offering pursuant to such Registration Statement is to be on any other basis, the Company shall so advise the Holders as part of the written notice given pursuant to this Section 2.03(a), and each Holder making a request for a Piggyback Registration pursuant to this Section 2.03(a) must, and the Company shall make such arrangements so that each such Holder may, participate in such offering on such basis, subject to the conditions of Section 2.03(b) and (c). Each Holder shall be permitted to withdraw all or part of its Registrable Securities from a Piggyback Registration at any time prior to the effectiveness of such Registration Statement.

(b) Priority of Piggyback Registration. If the managing underwriter or underwriters of any proposed Underwritten Offering of Registrable Securities included in a Piggyback Registration informs the Company and the Holders that have requested to participate in such Piggyback Registration in writing that, in its or their opinion, the number of securities which such Holders and any other Persons intend to include in such offering exceeds the number which can be sold in such offering without being likely to have a significant adverse effect on the price, timing or distribution of the securities offered or the market for the securities offered, then the securities to be included in such Registration shall be (i) first, 100% of the securities that the Company or (subject to Section 2.07) any Person (other than a Holder) exercising a contractual right to demand Registration, as the case may be, proposes to sell, (ii) second, and only if all the securities referred to in clause (i) have been included, the number of Registrable Securities that, in the opinion of such managing underwriter or underwriters, can be sold without having such adverse effect in such Registration, which such number shall be allocated pro rata among the Holders that have requested to participate in such Registration based on the relative number of Registrable Securities then held by each such Holder (provided, that any securities thereby allocated to a Holder that exceed such Holder's request shall be reallocated among the remaining requesting Holders in like manner), and (iii) third, and only if all of the Registrable Securities referred to in clause (ii) have been included in such Registration, any other securities eligible for inclusion in such Registration that, in the opinion of the managing underwriter or underwriters, can be sold without having such adverse effect in such Registration.

(c) Restrictions on Non-Institutional Investor Holders. Notwithstanding any provisions contained herein, Holders other than the Institutional Investors shall not be able to exercise the right to a Piggyback Registration unless at least one Institutional Investor exercises its rights with respect to such Piggyback Registration.

(d) No Effect on Demand Registrations. No Registration of Registrable Securities effected pursuant to a request under this Section 2.03 shall be deemed to have been effected pursuant to Section 2.01 or Section 2.02 or shall relieve the Company of its obligations under Section 2.01 or Section 2.02.

SECTION 2.04. Black-out Periods.

(a) Black-out Periods for Holders. In the event of a Company Public Sale of the Company's equity securities in an Underwritten Offering, each of the Holders agrees, if requested by the managing underwriter or underwriters in such Underwritten Offering (and, with respect to a Company Public Sale other than the IPO, if and only if the Institutional Investors also agree to such request), not to (1) offer for sale, sell, pledge, or otherwise dispose of (or enter into any transaction or device that is designed to, or could be expected to, result in the disposition by any Person at any time in the future of) any Company Shares (including Company Shares that may be deemed to be beneficially owned by the undersigned in accordance with the rules and regulations of the SEC and Company Shares that may be issued upon exercise of any options or warrants) or Company Share Equivalents or any other securities of the Company, (2) enter into any swap or other derivatives transaction that transfers to another, in whole or in part, any of the economic benefits or risks of ownership of Company Shares, Company Share Equivalents or any other securities of the Company, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of Company Shares or other securities, in cash or otherwise, (3) make any demand for or exercise any right or cause to be filed a Registration Statement, including any amendments thereto, with respect to the registration of any Company Shares or Company Share Equivalents or any other securities of the Company or (4) publicly disclose the intention to do any of the foregoing without the prior written consent of the Company, in each case, during the period commencing on the date of such offering and continuing for not more than one hundred eighty (180) days (in the event of the IPO) or ninety (90) days (in the event of any other Company Public Sale) after the date of the

underwriting agreement entered into in connection with such IPO or Company Public Sale, to the extent timely notified in writing by the Company or the managing underwriter or underwriters; provided, that no Holder shall be subject to any such black-out period of longer duration than that applicable to any Institutional Investor and such restrictions shall be subject to customary exceptions typically included in underwriter lock-up agreements, to the extent acceptable to the managing underwriter or underwriters. If requested by the managing underwriter or underwriters of any such Company Public Sale (and, with respect to any such Company Public Sale other than the IPO, if and only if the Institutional Investors agree to such request and enters into such separate agreement), the Holders shall execute a separate agreement to the foregoing effect. The Company may impose stop-transfer instructions with respect to the Company Shares or Company Share Equivalents (or other securities) subject to the foregoing restriction until the end of the period referenced above.

(b) Black-out Period for the Company and Others. In the case of an offering of Registrable Securities pursuant to Section 2.01 or 2.02 that is a Marketed Underwritten Offering, the Company and each of the Holders agree, if requested by the managing underwriter or underwriters with respect to such Marketed Underwritten Offering and only to the extent the Institutional Investors also agree, not to (1) offer for sale, sell, pledge, or otherwise dispose of (or enter into any transaction or device that is designed to, or could be expected to, result in the disposition by any Person at any time in the future of) any Company Shares (including Company Shares that may be deemed to be beneficially owned by the undersigned in accordance with the rules and regulations of the SEC and Company Shares that may be issued upon exercise of any options or warrants) or Company Share Equivalents or any other securities of the Company, (2) enter into any swap or other derivatives transaction that transfers to another, in whole or in part, any of the economic benefits or risks of ownership of Company Shares, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of Company Shares or other securities, in cash or otherwise, (3) make any demand for or exercise any right or cause to be filed a Registration Statement, including any amendments thereto, with respect to the registration of any Company Shares or Company Share Equivalents or any other securities of the Company or (4) publicly disclose the intention to do any of the foregoing without the prior written consent of the Company, in each case, during the period commencing on the date of such offering and continuing for not more than ninety (90) days (or such lesser period as may be agreed by the managing underwriter or underwriters) after the date of the underwriting agreement entered into in connection with such Marketed Underwritten Offering, to the extent timely notified in writing by an Institutional Investor or the managing underwriter or underwriters, as the case may be; provided, that no Holder shall be subject to any such black-out period of longer duration than that applicable to any Institutional Investor and such restrictions shall be subject to customary exceptions typically included in underwriter lock-up agreements, to the extent acceptable to the managing underwriter or underwriters. Notwithstanding the foregoing, the Company may effect a public sale or distribution of securities of the type described above and during the periods described above if such sale or distribution is made pursuant to Registrations on Form S-4 or Form S-8 or as part of any Registration of securities for offering and sale to employees, directors or consultants of the Company and its Subsidiaries pursuant to any employee stock plan or other employee benefit plan arrangement. The Company agrees to use its reasonable best efforts to obtain from each of its directors and officers and each other holder of restricted securities of the Company which securities are the same as or similar to the Registrable Securities being Registered, or any restricted securities convertible into or exchangeable or exercisable for any of such securities, an agreement not to effect any public sale or distribution of such securities during any such period referred to in this paragraph, except as part of any such Registration, if permitted. Without limiting the foregoing (but subject to Section 2.07), if after the date hereof the Company or any of its Subsidiaries grants any Person (other than a Holder) any rights to demand or participate in a Registration, the Company shall, and shall cause its Subsidiaries to, provide that the agreement with respect thereto shall include such Person's agreement to comply with any black-out period required by this Section 2.04(b) as if it were a Holder hereunder. If requested by the managing underwriter or underwriters of any such Marketed Underwritten

Offering (and if and only if the Institutional Investors agree to such request and enters into such separate agreement), the Holders shall execute a separate agreement to the foregoing effect. Subject to the provisions of this Agreement, the Company shall be responsible for negotiating all lock-up agreements with the managing underwriters and the Holders agree to execute the form so negotiated in accordance with the terms of this Agreement. The Company may impose stop-transfer instructions with respect to the Company Shares (or other securities) subject to the foregoing restriction until the end of the period referenced above.

(c) Notwithstanding anything contained to the contrary, nothing contained in this Section 2.04 shall apply to any Excluded Holder, except in connection with an IPO.

SECTION 2.05. Registration Procedures.

(a) In connection with the Company's Registration obligations under Sections 2.01, 2.02, and 2.03 and subject to the applicable terms and conditions set forth therein, the Company shall use its reasonable best efforts to effect such Registration to permit the sale of such Registrable Securities in accordance with the intended method or methods of distribution thereof as expeditiously as reasonably practicable, and in connection therewith the Company shall:

(i) prepare the required Registration Statement including all exhibits and financial statements required under the Securities Act to be filed therewith, and before filing a Registration Statement, Prospectus or any Issuer Free Writing Prospectus, or any amendments or supplements thereto, (x) furnish to the underwriters, if any, and the Institutional Investors, if applicable, copies of all documents prepared to be filed, which documents shall be subject to the review of such underwriters and the Institutional Investors and their respective counsel and (y) except in the case of a Registration under Section 2.03, not file any Registration Statement or Prospectus or amendments or supplements thereto to which the Institutional Investors or the underwriters, if any, shall reasonably object;

(ii) as promptly as practicable and in accordance with the other provisions of this Agreement, file with the SEC a Registration Statement relating to the Registrable Securities including all exhibits and financial statements required by the SEC to be filed therewith, and use its reasonable best efforts to cause such Registration Statement to become effective under the Securities Act as soon as practicable;

(iii) prepare and file with the SEC such pre- and post-effective amendments to such Registration Statement, supplements to the Prospectus and such amendments or supplements to any Issuer Free Writing Prospectus as may be (x) reasonably requested by the Institutional Investors, (y) reasonably requested by any other Participating Holder (to the extent such request relates to information relating to such Participating Holder), or (z) necessary to keep such Registration effective for the period of time required by this Agreement, and comply with provisions of the applicable securities laws with respect to the sale or other disposition of all securities covered by such Registration Statement during such period in accordance with the intended method or methods of disposition by the sellers thereof set forth in such Registration Statement;

(iv) promptly notify the Participating Holders and the managing underwriter or underwriters, if any, and (if requested) confirm such advice in writing and provide copies of the relevant documents, as soon as reasonably practicable after notice thereof is received by the Company (A) when the applicable Registration Statement or any amendment thereto has been filed or becomes effective, and when the applicable Prospectus or Issuer Free Writing Prospectus

or any amendment or supplement thereto has been filed, (B) of any written comments by the SEC or any request by the SEC or any other federal or state governmental authority for amendments or supplements to such Registration Statement, Prospectus or Issuer Free Writing Prospectus or for additional information, (C) of the issuance by the SEC of any stop order suspending the effectiveness of such Registration Statement or any order by the SEC or any other regulatory authority preventing or suspending the use of any preliminary or final Prospectus or any Issuer Free Writing Prospectus or the initiation or threatening of any proceedings for such purposes, (D) if, at any time, the representations and warranties of the Company in any applicable underwriting agreement cease to be true and correct in all material respects, (E) of the receipt by the Company of any notification with respect to the suspension of the qualification of the Registrable Securities for offering or sale in any jurisdiction and (F) of the receipt by the Company of any notification with respect to the initiation or threatening of any proceeding for the suspension of the qualification of the Registrable Securities for offering or sale in any jurisdiction;

(v) promptly notify the Participating Holders and the managing underwriter or underwriters, if any, when the Company becomes aware of the happening of any event as a result of which the applicable Registration Statement, the Prospectus included in such Registration Statement (as then in effect) or any Issuer Free Writing Prospectus contains any untrue statement of a material fact or omits to state a material fact necessary to make the statements therein (in the case of such Prospectus, any preliminary Prospectus or any Issuer Free Writing Prospectus, in light of the circumstances under which they were made) not misleading, when any Issuer Free Writing Prospectus includes information that may conflict with the information contained in the Registration Statement, or, if for any other reason it shall be necessary during such time period to amend or supplement such Registration Statement, Prospectus or Issuer Free Writing Prospectus in order to comply with the Securities Act and, in either case as promptly as reasonably practicable thereafter, prepare and file with the SEC, and furnish without charge to the Participating Holders and the managing underwriter or underwriters, if any, an amendment or supplement to such Registration Statement, Prospectus or Issuer Free Writing Prospectus which shall correct such misstatement or omission or effect such compliance;

(vi) use its reasonable best efforts to prevent, or obtain the withdrawal of, any stop order or other order suspending the use of any preliminary or final Prospectus or any Issuer Free Writing Prospectus;

(vii) promptly incorporate in a Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment to the applicable Registration Statement such information as the managing underwriter or underwriters and the Institutional Investors (to the extent the Institutional Investors are participating in such Registration) agree should be included therein relating to the plan of distribution with respect to such Registrable Securities, and make all required filings of such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment as soon as reasonably practicable after being notified of the matters to be incorporated in such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment;

(viii) furnish to each Participating Holder and each underwriter, if any, without charge, as many conformed copies as such Participating Holder or underwriter may reasonably request of the applicable Registration Statement and any amendment or post-effective amendment thereto, including financial statements and schedules, all documents incorporated therein by reference and all exhibits (including those incorporated by reference);

(ix) deliver to each Participating Holder and each underwriter, if any, without charge, as many copies of the applicable Prospectus (including each preliminary Prospectus), any Issuer Free Writing Prospectus and any amendment or supplement thereto as such Participating Holder or underwriter may reasonably request (it being understood that the Company consents to the use of such Prospectus, any Issuer Free Writing Prospectus and any amendment or supplement thereto by such Participating Holder and the underwriters, if any, in connection with the offering and sale of the Registrable Securities thereby) and such other documents as such Participating Holder or underwriter may reasonably request in order to facilitate the disposition of the Registrable Securities by such Participating Holder or underwriter;

(x) on or prior to the date on which the applicable Registration Statement is declared effective, use its reasonable best efforts to register or qualify, and cooperate with the Participating Holders, the managing underwriter or underwriters, if any, and their respective counsel, in connection with the registration or qualification of such Registrable Securities for offer and sale under the securities or "Blue Sky" laws of each state and other jurisdiction of the United States as any Participating Holder or managing underwriter or underwriters, if any, or their respective counsel reasonably request in writing and do any and all other acts or things reasonably necessary or advisable to keep such registration or qualification in effect for such period as required by Section 2.02(b), provided, that the Company shall not be required to qualify generally to do business in any jurisdiction where it is not then so qualified or to take any action which would subject it to taxation or general service of process in any such jurisdiction where it is not then so subject;

(xi) cooperate with the Participating Holders and the managing underwriter or underwriters, if any, to facilitate the timely preparation and delivery of certificates representing Registrable Securities to be sold and not bearing any restrictive legends, and enable such Registrable Securities to be in such denominations and registered in such names as the managing underwriters may request at least two (2) Business Days prior to any sale of Registrable Securities to the underwriters;

(xii) use its reasonable best efforts to cause the Registrable Securities covered by the applicable Registration Statement to be registered with or approved by such other governmental agencies or authorities as may be necessary to enable the seller or sellers thereof or the underwriter or underwriters, if any, to consummate the disposition of such Registrable Securities;

(xiii) not later than the effective date of the applicable Registration Statement, provide a CUSIP number for all Registrable Securities and provide the applicable transfer agent with printed certificates for the Registrable Securities which are in a form eligible for deposit with The Depository Trust Company or any other required depository;

(xiv) make such representations and warranties to the Participating Holders and the underwriters or agents, if any, in form, substance and scope as are customarily made by issuers in secondary underwritten public offerings;

(xv) enter into such customary agreements (including underwriting and indemnification agreements) and take all such other actions as the Institutional Investors or the managing underwriter or underwriters, if any, reasonably request in order to expedite or facilitate the registration and disposition of such Registrable Securities;

(xvi) obtain for delivery to the Participating Holders and to the underwriter or underwriters, if any, an opinion or opinions from counsel for the Company dated the effective

date of the Registration Statement or, in the event of an Underwritten Offering, the date of the closing under the underwriting agreement, in customary form, scope and substance, which opinions shall be reasonably satisfactory to such Participating Holders or underwriters, as the case may be, and their respective counsel;

(xvii) in the case of an Underwritten Offering, obtain for delivery to the Company and the managing underwriter or underwriters, with copies to the Participating Holders, a cold comfort letter from the Company's independent certified public accountants in customary form and covering such matters of the type customarily covered by cold comfort letters as the managing underwriter or underwriters reasonably request, dated the date of execution of the underwriting agreement and brought down to the closing under the underwriting agreement;

(xviii) cooperate with each Participating Holder and each underwriter, if any, participating in the disposition of such Registrable Securities and their respective counsel in connection with any filings required to be made with the FINRA;

(xix) use its reasonable best efforts to comply with all applicable securities laws and make available to its security holders, as soon as reasonably practicable, an earnings statement satisfying the provisions of section 11(a) of the Securities Act and the rules and regulations promulgated thereunder;

(xx) provide and cause to be maintained a transfer agent and registrar for all Registrable Securities covered by the applicable Registration Statement from and after a date not later than the effective date of such Registration Statement;

(xxi) use its reasonable best efforts to cause all Registrable Securities covered by the applicable Registration Statement to be listed on each securities exchange on which any of the Company Shares are then listed or quoted and on each inter-dealer quotation system on which any of the Company Shares are then quoted;

(xxii) make available upon reasonable notice at reasonable times and for reasonable periods for inspection by the Institutional Investors, by any underwriter participating in any disposition to be effected pursuant to such Registration Statement and by any attorney, accountant or other agent retained by such Institutional Investors or any such underwriter, all pertinent financial and other records, pertinent corporate documents and properties of the Company, and cause all of the Company's officers, directors and employees and the independent public accountants who have certified its financial statements to make themselves available to discuss the business of the Company and to supply all information reasonably requested by any such Person in connection with such Registration Statement as shall be necessary to enable them to exercise their due diligence responsibility; provided, that any such Person gaining access to information regarding the Company pursuant to this Section 2.05(a)(xii) shall agree to hold in strict confidence and shall not make any disclosure or use any information regarding the Company that the Company determines in good faith to be confidential, and of which determination such Person is notified, unless (w) the release of such information is requested or required by law or by deposition, interrogatory, requests for information or documents by a governmental entity, subpoena or similar process, (x) such information is or becomes publicly known other than through a breach of this or any other agreement of which such Person has actual knowledge, (y) such information is or becomes available to such Person on a non-confidential basis from a source other than the Company or (z) such information is independently developed by such Person;

(xxiii) in the case of an Underwritten Offering, cause the senior executive officers of the Company to participate in the customary "road show" presentations that may be reasonably requested by the managing underwriter or underwriters in any such Underwritten Offering and otherwise to facilitate, cooperate with, and participate in each proposed offering contemplated herein and customary selling efforts related thereto; and

(xxiv) otherwise comply in all material respects with all applicable rules and regulations of the SEC in connection with any Registration Statement and the disposition of all Registrable Securities covered by such Registration Statement.

(b) The Company may require each Participating Holder to furnish to the Company such information regarding the distribution of such securities and such other information relating to such Participating Holder and its ownership of Registrable Securities as the Company may from time to time reasonably request in writing. Each Participating Holder agrees to furnish such information to the Company and to cooperate with the Company as reasonably necessary to enable the Company to comply with the provisions of this Agreement.

(c) Each Participating Holder agrees that, upon delivery of any notice by the Company of the happening of any event of the kind described in Section 2.05(a)(iv)(C), (D), or (E) or Section 2.05(a)(v), such Participating Holder will forthwith discontinue disposition of Registrable Securities pursuant to such Registration Statement until (i) such Participating Holder's receipt of the copies of the supplemented or amended Prospectus or Issuer Free Writing Prospectus contemplated by Section 2.05(a)(v), (ii) such Participating Holder is advised in writing by the Company that the use of the Prospectus or Issuer Free Writing Prospectus, as the case may be, may be resumed, (iii) such Participating Holder is advised in writing by the Company of the termination, expiration or cessation of such order or suspension referenced in Section 2.05(a)(iv)(C) or (E) or (iv) such Participating Holder is advised in writing by the Company that the representations and warranties of the Company in such applicable underwriting agreement are true and correct in all material respects. If so directed by the Company, such Participating Holder shall deliver to the Company (at the Company's expense) all copies, other than permanent file copies then in such Participating Holder's possession, of the Prospectus or any Issuer Free Writing Prospectus covering such Registrable Securities current at the time of delivery of such notice. In the event the Company shall give any such notice, the period during which the applicable Registration Statement is required to be maintained effective shall be extended by the number of days during the period from and including the date of the giving of such notice to and including the date when each seller of Registrable Securities covered by such Registration Statement either receives the copies of the supplemented or amended Prospectus or Issuer Free Writing Prospectus contemplated by Section 2.05(a)(v) or is advised in writing by the Company that the use of the Prospectus or Issuer Free Writing Prospectus may be resumed.

SECTION 2.06. Underwritten Offerings.

(a) Demand and Shelf Registrations. If requested by the underwriters for any Underwritten Offering requested by the Institutional Investors pursuant to a Registration under Section 2.01 or Section 2.02, as applicable, the Company shall enter into an underwriting agreement with such underwriters for such offering, such agreement to be reasonably satisfactory in substance and form to the Company, the Institutional Investors and the underwriters, and to contain such representations and warranties by the Company and such other terms as are generally prevailing in agreements of that type, including indemnities no less favorable to the recipient thereof than those provided in Section 2.09. The Institutional Investors shall cooperate with the Company in the negotiation of such underwriting agreement and shall give consideration to the reasonable suggestions of the Company regarding the form thereof. The Participating Holders shall be parties to such underwriting agreement, which underwriting

agreement shall (i) contain such representations and warranties by, and the other agreements on the part of, the Company to and for the benefit of such Participating Holders as are customarily made by issuers to selling stockholders in secondary underwritten public offerings and (ii) provide that any or all of the conditions precedent to the obligations of such underwriters under such underwriting agreement also shall be conditions precedent to the obligations of such Participating Holders. Any such Participating Holder shall not be required to make any representations or warranties to or agreements with the Company or the underwriters in connection with such underwriting agreement other than representations, warranties or agreements regarding such Participating Holder, such Participating Holder's title to the Registrable Securities, such Participating Holder's authority to sell the Registrable Securities, such Participating Holder's intended method of distribution, absence of liens with respect to the Registrable Securities, enforceability of the applicable underwriting agreement as against such Participating Holder, receipt of all consents and approvals with respect to the entry into such underwriting agreement and the sale of such Registrable Securities and any other representations required to be made by such Participating Holder under applicable law, rule or regulation, and the aggregate amount of the liability of such Participating Holder in connection with such underwriting agreement shall not exceed such Participating Holder's net proceeds from such Underwritten Offering.

(b) Piggyback Registrations. If the Company proposes to register any of its securities under the Securities Act as contemplated by Section 2.03 and such securities are to be distributed in an Underwritten Offering through one or more underwriters, the Company shall, if requested by any Holder pursuant to Section 2.03 and subject to the provisions of Section 2.03(b) and (c), use its reasonable best efforts to arrange for such underwriters to include on the same terms and conditions that apply to the other sellers in such Registration all the Registrable Securities to be offered and sold by such Holder among the securities of the Company to be distributed by such underwriters in such Registration. The Participating Holders shall be parties to the underwriting agreement between the Company and such underwriters, which underwriting agreement shall (i) contain such representations and warranties by, and the other agreements on the part of, the Company to and for the benefit of such Participating Holders as are customarily made by issuers to selling stockholders in secondary underwritten public offerings and (ii) provide that any or all of the conditions precedent to the obligations of such underwriters under such underwriting agreement also shall be conditions precedent to the obligations of such Participating Holders. Any such Participating Holder shall not be required to make any representations or warranties to, or agreements with the Company or the underwriters in connection with such underwriting agreement other than representations, warranties or agreements regarding such Participating Holder, such Participating Holder's title to the Registrable Securities, such Participating Holder's authority to sell the Registrable Securities, such Holder's intended method of distribution, absence of liens with respect to the Registrable Securities, enforceability of the applicable underwriting agreement as against such Participating Holder, receipt of all consents and approvals with respect to the entry into such underwriting agreement and the sale of such Registrable Securities or any other representations required to be made by such Participating Holder under applicable law, rule or regulation, and the aggregate amount of the liability of such Participating Holder in connection with such underwriting agreement shall not exceed such Participating Holder's net proceeds from such Underwritten Offering.

(c) Participation in Underwritten Registrations. Subject to the provisions of Sections 2.06(a) and 2.06(b) above, no Person may participate in any Underwritten Offering hereunder unless such Person (i) agrees to sell such Person's securities on the basis provided in any underwriting arrangements approved by the Persons entitled to approve such arrangements and (ii) completes and executes all questionnaires, powers of attorney, indemnities, underwriting agreements and other documents required under the terms of such underwriting arrangements.

(d) Price and Underwriting Discounts. In the case of an Underwritten Offering under Section 2.01 or Section 2.02, the price, underwriting discount and other financial terms for the Registrable Securities shall be determined by the Institutional Investors so long as all Registrable Securities are subject to the same financial terms.

SECTION 2.07. No Inconsistent Agreements; Additional Rights. The Company is not currently a party to, and shall not hereafter enter into without the prior written consent of the Institutional Investors, any agreement with respect to its securities that is inconsistent with the rights granted to the Holders by this Agreement, including allowing any other holder or prospective holder of any securities of the Company (a) registration rights in the nature or substantially in the nature of those set forth in Section 2.01, Section 2.02 or Section 2.03 that would have priority over the Registrable Securities with respect to the inclusion of such securities in any Registration (except to the extent such registration rights are solely related to registrations of the type contemplated by Section 2.03(a)(iii) and (iv)) or (b) demand registration rights in the nature or substantially in the nature of those set forth in Section 2.01 or Section 2.02 that are exercisable prior to such time as the Institutional Investors and the Holders can first exercise their rights under Section 2.01 or Section 2.02, as applicable.

SECTION 2.08. Registration Expenses. All expenses incident to the Company's performance of or compliance with this Agreement shall be paid by the Company, including (i) all registration and filing fees, and any other fees and expenses associated with filings required to be made with the SEC, FINRA and if applicable, the fees and expenses of any "qualified independent underwriter," as such term is defined in FINRA Rule 5121 (or any successor provision), and of its counsel, (ii) all fees and expenses in connection with compliance with any securities or "Blue Sky" laws (including fees and disbursements of counsel for the underwriters in connection with "Blue Sky" qualifications of the Registrable Securities), (iii) all printing, duplicating, word processing, messenger, telephone, facsimile and delivery expenses (including expenses of printing certificates for the Registrable Securities in a form eligible for deposit with The Depository Trust Company or any other required depositories and of printing Prospectuses and Issuer Free Writing Prospectuses), (iv) all fees and disbursements of counsel for the Company and of all independent certified public accountants of the Company (including the expenses of any special audit and cold comfort letters required by or incident to such performance), (v) Securities Act liability insurance or similar insurance if the Company so desires or the underwriters so require in accordance with then-customary underwriting practice, (vi) all fees and expenses incurred in connection with the listing of Registrable Securities on any securities exchange or quotation of the Registrable Securities on any inter-dealer quotation system, (vii) all applicable rating agency fees with respect to the Registrable Securities, (viii) all reasonable fees and disbursements of one legal counsel and one accounting firm as selected by the holders of a majority of the Registrable Securities included in such Registration, (ix) any reasonable fees and disbursements of underwriters customarily paid by issuers or sellers of securities, (x) all fees and expenses of any special experts or other Persons retained by the Company in connection with any Registration, (xi) all of the Company's internal expenses (including all salaries and expenses of its officers and employees performing legal or accounting duties), (xii) all expenses related to the "road-show" for any Underwritten Offering, including all travel, meals and lodging and (xiii) any other fees and disbursements customarily paid by the issuers of securities. All such expenses are referred to herein as "Registration Expenses." The Company shall not be required to pay any underwriting discounts and commissions and transfer taxes, if any, attributable to the sale of Registrable Securities. In connection with each Registration or offering made pursuant to this Agreement, the Company shall pay (i) the reasonable fees and expenses of the Institutional Investors' counsel and (ii) the reasonable fees and expenses of one counsel to the other Holders (not including the Institutional Investors), which counsel shall be designated by other Holders holding a majority of the Registrable Securities included in such Registration and may (but is not required to) be the same counsel for the Institutional Investors.

SECTION 2.09. Indemnification.

(a) Indemnification by the Company. The Company agrees to indemnify and hold harmless, to the full extent permitted by law, each of the Holders, each of their respective direct or indirect partners, members, managers or shareholders and each of such partner's, member's or shareholder's partners, members, managers or shareholders and, with respect to all of the foregoing Persons, each of their respective Affiliates, employees, directors, officers, trustees or agents and each Person who controls (within the meaning of the Securities Act or the Exchange Act) such Persons and each of their respective Representatives from and against any and all losses, penalties, judgments, suits, costs, claims, damages, liabilities and expenses, joint or several (including reasonable costs of preparation and investigation and legal expenses) (each, a "Loss" and collectively, "Losses") arising out of or based upon (i) any untrue statement or alleged untrue statement of a material fact contained in any Registration Statement under which such Registrable Securities were Registered under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment or supplement thereto or any documents incorporated by reference therein), any Issuer Free Writing Prospectus or amendment or supplement thereto, or any other disclosure document produced by or on behalf of the Company or any of its Subsidiaries including reports and other documents filed under the Exchange Act, (ii) any omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus, preliminary Prospectus or Issuer Free Writing Prospectus, in light of the circumstances under which they were made) not misleading, (iii) any violation or alleged violation by the Company of any federal, state or common law rule or regulation applicable to the Company or any of its Subsidiaries in connection with any such registration, qualification, compliance or sale of Registrable Securities, (iv) any failure to register or qualify Registrable Securities in any state where the Company or its agents have affirmatively undertaken or agreed in writing that the Company (the undertaking of any underwriter being attributed to the Company) will undertake such registration or qualification on behalf of the Holders of such Registrable Securities (provided, that, in such instance, the Company shall not be so liable if it has undertaken its reasonable best efforts to so register or qualify such Registrable Securities) or (v) any actions or inactions or proceedings in respect of the foregoing whether or not such indemnified party is a party thereto, and the Company will reimburse, as incurred, each such Holder and each of their respective direct or indirect partners, members or shareholders and each of such partner's, member's or shareholder's partners members or shareholders and, with respect to all of the foregoing Persons, each of their respective Affiliates, employees, directors, officers, trustees or agents and controlling Persons and each of their respective Representatives, for any legal and any other expenses reasonably incurred in connection with investigating or defending any such claim, loss, damage, liability or action; provided, that the Company shall not be liable to any particular indemnified party to the extent that any such Loss arises out of or is based upon (A) an untrue statement or alleged untrue statement or omission or alleged omission made in any such Registration Statement or other document in reliance upon and in conformity with written information furnished to the Company by such indemnified party expressly for use in the preparation thereof or (B) an untrue statement or omission in a preliminary Prospectus relating to Registrable Securities, if a Prospectus (as then amended or supplemented) that would have cured the defect was furnished to the indemnified party from whom the Person asserting the claim giving rise to such Loss purchased Registrable Securities at least five (5) days prior to the written confirmation of the sale of the Registrable Securities to such Person and a copy of such Prospectus (as amended and supplemented) was not sent or given by or on behalf of such indemnified party to such Person at or prior to the written confirmation of the sale of the Registrable Securities to such Person. This indemnity shall be in addition to any liability the Company may otherwise have. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of such Holder or any indemnified party and shall survive the transfer of such securities by such Holder. The Company shall also indemnify underwriters, selling brokers, dealer managers and similar securities industry professionals participating in the distribution, their officers and directors and each Person who controls such Persons

(within the meaning of the Securities Act and the Exchange Act) to the same extent as provided above with respect to the indemnification of the indemnified parties.

(b) Indemnification by the Participating Holders. Each Participating Holder agrees (severally and not jointly) to indemnify and hold harmless, to the fullest extent permitted by law, the Company, its directors and officers and each Person who controls the Company (within the meaning of the Securities Act or the Exchange Act), and each other Holder, each of such other Holder's respective direct or indirect partners, members, managers or shareholders and each of such partner's, member's or shareholder's partners, members, managers or shareholders and, with respect to all of the foregoing Persons, each of their respective Affiliates, employees, directors, officers, trustees or agents and each Person who controls (within the meaning of the Securities Act or the Exchange Act) such Persons and each of their respective Representatives from and against any Losses resulting from (i) any untrue statement or alleged untrue statement of a material fact in any Registration Statement under which such Registrable Securities were Registered under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment or supplement thereto or any documents incorporated by reference therein) or any Issuer Free Writing Prospectus or amendment or supplement thereto, or (ii) any omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus, preliminary Prospectus or Issuer Free Writing Prospectus, in light of the circumstances under which they were made) not misleading, in each case to the extent, but only to the extent, that such untrue statement (or alleged untrue statement) or omission (or alleged omission) is contained in any information furnished in writing by such Holder to the Company specifically for inclusion in such Registration Statement and has not been corrected in a subsequent writing prior to or concurrently with the sale of the Registrable Securities to the Person asserting the claim, in each case to the extent, but only to the extent, that such untrue statement (or alleged untrue statement) or omission (or alleged omission) was made in such Registration Statement, Prospectus, offering circular, Issuer Free Writing Prospectus or other document, in reliance upon and in conformity with written information furnished to the Company by such Holder expressly for use therein. In no event shall the liability of such Holder hereunder be greater in amount than the dollar amount of the net proceeds received by such Holder under the sale of Registrable Securities giving rise to such indemnification obligation.

(c) Conduct of Indemnification Proceedings. Any Person entitled to indemnification under this Section 2.09 shall (i) give prompt written notice to the indemnifying party of any claim with respect to which it seeks indemnification (provided, that any delay or failure to so notify the indemnifying party shall relieve the indemnifying party of its obligations hereunder only to the extent, if at all, that it is actually and materially prejudiced by reason of such delay or failure) and (ii) permit such indemnifying party to assume the defense of such claim with counsel reasonably satisfactory to the indemnified party; provided, that any Person entitled to indemnification hereunder shall have the right to select and employ separate counsel and to participate in the defense of such claim, but the fees and expenses of such counsel shall be at the expense of such Person unless (A) the indemnifying party has agreed in writing to pay such fees or expenses, (B) the indemnifying party shall have failed to assume the defense of such claim within a reasonable time after delivery of notice of such claim from the Person entitled to indemnification hereunder and employ counsel reasonably satisfactory to such Person, (C) the indemnified party has reasonably concluded (based upon advice of its counsel) that there may be legal defenses available to it or other indemnified parties that are different from or in addition to those available to the indemnifying party, or (D) in the reasonable judgment of any such Person (based upon advice of its counsel) a conflict of interest may exist between such Person and the indemnifying party with respect to such claims (in which case, if the Person notifies the indemnifying party in writing that such Person elects to employ separate counsel at the expense of the indemnifying party, the indemnifying party shall not have the right to assume the defense of such claim on behalf of such Person). If the indemnifying party assumes the defense, the indemnifying party shall not have the right to settle such action, consent to entry of any

judgment or enter into any settlement, in each case without the prior written consent of the indemnified party, unless the entry of such judgment or settlement (i) includes as an unconditional term thereof the giving by the claimant or plaintiff to such indemnified party of an unconditional release from all liability in respect to such claim or litigation and (ii) does not include a statement as to or an admission of fault, culpability or a failure to act by or on behalf of such indemnified party, and provided, that any sums payable in connection with such settlement are paid in full by the indemnifying party. If such defense is not assumed by the indemnifying party, the indemnifying party will not be subject to any liability for any settlement made without its prior written consent, but such consent may not be unreasonably withheld. It is understood that the indemnifying party or parties shall not, except as specifically set forth in this Section 2.09(c), in connection with any proceeding or related proceedings in the same jurisdiction, be liable for the reasonable fees, disbursements or other charges of more than one separate firm admitted to practice in such jurisdiction at any one time unless (x) the employment of more than one counsel has been authorized in writing by the indemnifying party or parties, (y) an indemnified party has reasonably concluded (based on the advice of counsel) that there may be legal defenses available to it that are different from or in addition to those available to the other indemnified parties, or (z) a conflict or potential conflict exists or may exist (based upon advice of counsel to an indemnified party) between such indemnified party and the other indemnified parties, in each of which cases the indemnifying party shall be obligated to pay the reasonable fees and expenses of such additional counsel or counsels.

(d) Contribution. If for any reason the indemnification provided for in paragraphs (a) and (b) of this Section 2.09 is unavailable to an indemnified party or insufficient in respect of any Losses referred to therein, then the indemnifying party shall contribute to the amount paid or payable by the indemnified party as a result of such Loss in such proportion as is appropriate to reflect the relative fault of the indemnifying party on the one hand and the indemnified party or parties on the other hand in connection with the acts, statements or omissions that resulted in such losses, as well as any other relevant equitable considerations. In connection with any Registration Statement filed with the SEC by the Company, the relative fault of the indemnifying party on the one hand and the indemnified party on the other hand shall be determined by reference to, among other things, whether any untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The parties hereto agree that it would not be just or equitable if contribution pursuant to this Section 2.09(d) were determined by pro rata allocation or by any other method of allocation that does not take account of the equitable considerations referred to in this Section 2.09(d). No Person guilty of fraudulent misrepresentation (within the meaning of section 11(f) of the Securities Act) shall be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation. The amount paid or payable by an indemnified party as a result of the Losses referred to in Sections 2.09(a) and 2.09(b) shall be deemed to include, subject to the limitations set forth above, any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any such action or claim. Notwithstanding the provisions of this Section 2.09(d), in connection with any Registration Statement filed by the Company, a Participating Holder shall not be required to contribute any amount in excess of the dollar amount of the net proceeds received by such Holder under the sale of Registrable Securities giving rise to such contribution obligation less any amount paid by such Holders pursuant to Section 2.09(b). If indemnification is available under this Section 2.09, the indemnifying parties shall indemnify each indemnified party to the full extent provided in Sections 2.09(a) and 2.09(b) hereof without regard to the provisions of this Section 2.09(d).

(e) No Exclusivity. The remedies provided for in this Section 2.09 are not exclusive and shall not limit any rights or remedies which may be available to any indemnified party at law or in equity or pursuant to any other agreement.

(f) Conflicts. Notwithstanding the foregoing, to the extent that the provisions on indemnification and contribution contained in the underwriting agreement entered into in connection with the underwritten public offering are in conflict with the foregoing provisions in this Section 2.09, the provisions in the underwriting agreement shall control.

(g) Survival. The indemnities provided in this Section 2.09 shall survive the transfer of any Registrable Securities by such Holder.

SECTION 2.10. Rules 144 and 144A and Regulation S. The Company covenants that it will file the reports required to be filed by it under the Securities Act and the Exchange Act and the rules and regulations adopted by the SEC thereunder (or, if the Company is not required to file such reports, it will, upon the reasonable request of the Institutional Investors, make publicly available such necessary information for so long as necessary to permit sales pursuant to Rules 144, 144A or Regulation S under the Securities Act), and it will take such further action as the Institutional Investors may reasonably request, all to the extent required from time to time to enable the Holders, following the IPO, to sell Registrable Securities without Registration under the Securities Act within the limitation of the exemptions provided by (i) Rules 144, 144A or Regulation S under the Securities Act, as such Rules may be amended from time to time, or (ii) any similar rule or regulation hereafter adopted by the SEC. Upon the reasonable request of a Holder, the Company will deliver to such Holder a written statement as to whether it has complied with such requirements and, if not, the specifics thereof.

SECTION 2.11. Limitation on Registrations and Underwritten Offerings. Notwithstanding the rights and obligations set forth in Sections 2.01 and 2.02, in no event shall the Company be obligated to take any action to (i) effect more than one Marketed Underwritten Offering in any consecutive 90-day period or (ii) effect any Underwritten Offering unless the Institutional Investors initiating such Underwritten Offering propose to sell Registrable Securities in such Underwritten Offering having a reasonably anticipated gross aggregate price (before deduction of underwriter commissions and offering expenses) of at least $10,000,000.

SECTION 2.12. Clear Market. With respect to any Underwritten Offerings of Registrable Securities by the Institutional Investors pursuant to this Agreement, the Company agrees not to effect (other than pursuant to the Registration applicable to such Underwritten Offering or pursuant to a Special Registration) any public sale or distribution, or to file any Registration Statement (other than pursuant to the Registration applicable to such Underwritten Offering or pursuant to a Special Registration) covering any of its equity securities or any securities convertible into or exchangeable or exercisable for such securities, during the period not to exceed ten (10) days prior and sixty (60) days following the effective date of such offering or such longer period up to ninety (90) days as may be requested by the managing underwriter for such Underwritten Offering. "Special Registration" means the registration of (A) equity securities and/or options or other rights in respect thereof solely registered on Form S-4 or Form S-8 or (B) shares of equity securities and/or options or other rights in respect thereof to be offered to directors, employees, consultants, customers, lenders or vendors of the Company or its Subsidiaries or in connection with dividend reinvestment plans.

SECTION 2.13. In-Kind Distributions. If any Institutional Investor, as an Investment Fund or an Affiliate of an Investment Fund, seeks to effectuate an in-kind distribution of all or part of its Company Shares to its direct or indirect equityholders, the Company will reasonably cooperate with and assist such Institutional Investor, such equityholders and the Company's transfer agent to facilitate such in-kind distribution in the manner reasonably requested by such Institutional Investor (including the delivery of instruction letters by the Company or its counsel to the Company's transfer agent, the delivery of customary legal opinions by counsel to the Company and the delivery of Company Shares without restrictive legends, to the extent no longer applicable) and any such equityholder shall,

with its consent and with the consent of such Institutional Investor, be treated as an Institutional Investor and/or Holder (as determined by such Institutional Investor) for all purposes of this Agreement, with the same rights, benefits and obligations hereunder as an Institutional Investor and/or Holder, as applicable.

ARTICLE III

MISCELLANEOUS

SECTION 3.01. Term.

(a) This Agreement shall terminate with respect to any Holder (i) with the prior written consent of the Institutional Investors in connection with the consummation of a Change of Control, (ii) for those Holders (other than the Institutional Investors) that beneficially own less than five percent (5%) of the Company's outstanding Company Shares, if all of the Registrable Securities then owned by such Holder could be sold in any ninety (90)-day period pursuant to Rule 144, (iii) as to any Holder, if all of the Registrable Securities held by such Holder have been sold or otherwise transferred in a Registration pursuant to the Securities Act or pursuant to an exemption therefrom, or (iv) with respect to any Holder that is an officer, director, employee or consultant of the Company or any of its Subsidiaries on the date that is ninety (90) days after the date on which such Holder ceases to be an employee, director or consultant (as applicable) of the Company and its Subsidiaries.

(b) Notwithstanding the foregoing, the provisions of Sections 2.09, 2.10 and 2.13 and all of this Article III shall survive any such termination. Upon the written request of the Company, each Holder agrees to promptly deliver a certificate to the Company setting forth the number of Registrable Securities then beneficially owned by such Holder.

SECTION 3.02. Injunctive Relief. It is hereby agreed and acknowledged that it will be impossible to measure in money the damage that would be suffered if the parties fail to comply with any of the obligations herein imposed on them and that in the event of any such failure, an aggrieved Person will be irreparably damaged and will not have an adequate remedy at law. Any such Person shall, therefore, be entitled (in addition to any other remedy to which it may be entitled in law or in equity) to injunctive relief, including specific performance, to enforce such obligations, and if any action should be brought in equity to enforce any of the provisions of this Agreement, none of the parties hereto shall raise the defense that there is an adequate remedy at law.

SECTION 3.03. Attorneys' Fees. In any action or proceeding brought to enforce any provision of this Agreement or where any provision hereof is validly asserted as a defense, the successful party shall, to the extent permitted by applicable law, be entitled to recover reasonable attorneys' fees in addition to any other available remedy.

SECTION 3.04. Notices. Unless otherwise specified herein, all notices, consents, approvals, reports, designations, requests, waivers, elections and other communications authorized or required to be given pursuant to this Agreement shall be in writing and shall be deemed to have been given (a) when personally delivered, (b) when transmitted via facsimile to the number set out below or on Schedule A or Schedule B, as applicable, if the sender receives confirmation of delivery or if the sender on the same or following Business Day sends a confirming copy of such notice by a recognized delivery service (charges prepaid), (c) the day following the day (except if not a Business Day then the next Business Day) on which the same has been delivered prepaid to a reputable national air courier service, (d) when transmitted via email (including via attached pdf document) to the email address set out below or on Schedule A or Schedule B, as applicable, as applicable, if the sender on the same day sends a confirming copy of such notice by a recognized delivery service (charges prepaid) or (e) the third

Business Day following the day on which the same is sent by certified or registered mail, postage prepaid, in each case, to the respective parties, as applicable, at the address, facsimile number or email address set forth below or on Schedule A or Schedule B hereto, as applicable (or such other address, facsimile number or email address as any Holder may specify by notice to the Company in accordance with this Section 3.04):

EQT Avatar Parent L.P.
c/o EQT Partners Inc.
1114 Avenue of the Americas, 45th Floor
New York, NY 10036
Fax: [ ]
Attention: Eric Liu
Email: [ ]
with a copy (which shall not constitute actual or constructive notice) to:

Simpson Thacher & Bartlett LLP
2475 Hanover Street
Palo Alto, CA 94304
Fax: [ ]
Attention: William Brentani
Email: [ ]

SECTION 3.05. Publicity and Confidentiality. Each of the parties hereto shall keep confidential this Agreement and the transactions contemplated hereby, and any nonpublic information received pursuant hereto, and shall not disclose, issue any press release or otherwise make any public statement relating hereto or thereto without the prior written consent of the Company and the Institutional Investors unless so required by applicable law or any governmental authority; provided, that no such written consent shall be required (and each party shall be free to release such information) for disclosures (a) to each party's partners, members, advisors, employees, agents, accountants, trustee, attorneys, Affiliates and investment vehicles managed or advised by such party or the partners, members, advisors, employees, agents, accountants, trustee or attorneys of such Affiliates or managed or advised investment vehicles, in each case so long as such Persons agree to keep such information confidential, (b) to the extent required by law, rule or regulation or (c) expressly permitted by this Agreement.

SECTION 3.06. Amendment. The terms and provisions of this Agreement may only be amended, modified or waived at any time and from time to time by a writing executed by the Company and the Institutional Investors; provided, however, that any modification, amendment or waiver of this Agreement that would subject any Holder (other than the Institutional Investors and any Excluded Holder) to materially adverse disproportionate treatment relative to the other Holders (other than the Institutional Investors and any Excluded Holder) taking into account and considering the rights of such Holder prior to such amendment, modification or waiver (each such Holder, an "Impacted Holder") shall require the agreement of the Majority Impacted Holders; provided, further, that any modification, amendment or waiver of Section 2.02(c), Section 2.02(e), Section 2.03, Section 2.04 or Section 3.06 of this Agreement (or to any defined term used in any such Section of this Agreement) that would materially and adversely affect the rights of any Holder (other than the Institutional Investors) or any other modification, amendment or waiver of this Agreement that would impose upon any Holder (other than the Institutional Investors) any additional material obligation or would materially and adversely affect the rights of any Holder (other than the Institutional Investors) under Section 2.09 of this Agreement shall require the agreement of the adversely affected Holders (other than the Institutional Investors) holding a majority of the Registrable Securities held by all such adversely affected Holders (other than the

Institutional Investors) as of the applicable date of determination; provided, further, that notwithstanding the foregoing proviso, the Institutional Investors may waive Section 2.04(a) or Section 2.04(b) without the consent of any other Holder, provided, further, that, in the event the Institutional Investors no longer hold any Company Shares, this Agreement may be amended, modified, supplemented, restated, waived or terminated with the written consent of (a) the Company and (b) the Holders holding a majority of the Company Shares held by the Holders. No waiver by any party of any of the provisions hereof will be effective unless explicitly set forth in writing and executed by the party so waiving. Except as provided in the preceding sentence, no action taken pursuant to this Agreement, including without limitation, any investigation by or on behalf of any party, will be deemed to constitute a waiver by the party taking such action of compliance with any covenants or agreements contained herein. The waiver by any party hereto of a breach of any provision of this Agreement will not operate or be construed as a waiver of any subsequent breach.

SECTION 3.07. Successors, Assigns and Transferees.

(a) The rights and obligations of each party hereto may not be assigned, in whole or in part, without the written consent of (i) the Company and (ii) the Institutional Investors; provided, however, that notwithstanding the foregoing, the rights and obligations set forth herein may be assigned, in whole or in part, by any Institutional Investor to any transferee of Registrable Securities that holds (after giving effect to such transfer) in excess of one percent (1%) of the then-outstanding Registrable Securities, and such transferee shall, with the consent of the Institutional Investors, be treated as an Institutional Investor and/or Holder (as determined by the Institutional Investors) for all purposes under this Agreement (each Person to whom the rights and obligations are assigned in compliance with this Section 3.07 is a "Permitted Assignee" and all such Persons, collectively, are "Permitted Assignees"); provided, further, that such transferee shall only be admitted as a party hereunder upon its, his or her execution and delivery of a joinder agreement, in form and substance acceptable to the Institutional Investors, agreeing to be bound by the terms and conditions of this Agreement as if such Person were a party hereto (together with any other documents the Institutional Investors determine are necessary to make such Person a party hereto), whereupon such Person will be treated as an Institutional Investor and/or Holder, as applicable, for all purposes of this Agreement, with the same rights, benefits and obligations hereunder as an Institutional Investor and/or Holder, as applicable, with respect to the transferred Registrable Securities (except that if the transferee was a Holder prior to such transfer, such transferee shall have the same rights, benefits and obligations with respect to such transferred Registrable Securities as were applicable to Registrable Securities held by such transferee prior to such transfer).

(b) Nothing herein shall operate to permit a transfer of Registrable Securities otherwise restricted by the Stockholders Agreement or any other agreement to which any Holder may be a party.

SECTION 3.08. Binding Effect. Except as otherwise provided in this Agreement, the terms and provisions of this Agreement shall be binding on and inure to the benefit of each of the parties hereto and their respective successors.

SECTION 3.09. Third Party Beneficiaries. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon any Person not a party hereto (other than those Persons entitled to indemnity or contribution under Section 2.09, each of whom shall be a third party beneficiary thereof) any right, remedy or claim under or by virtue of this Agreement.

SECTION 3.10. Governing Law; Jurisdiction. THIS AGREEMENT SHALL BE GOVERNED AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF DELAWARE, WITHOUT REGARD TO THE CONFLICTS OF LAW PRINCIPLES THEREOF. ANY

ACTION OR PROCEEDING AGAINST THE PARTIES RELATING IN ANY WAY TO THIS AGREEMENT MAY BE BROUGHT AND ENFORCED EXCLUSIVELY IN THE COURTS OF THE STATE OF DELAWARE OR (TO THE EXTENT SUBJECT MATTER JURISDICTION EXISTS THEREFOR) THE U.S. DISTRICT COURT FOR THE DISTRICT OF DELAWARE, AND THE PARTIES IRREVOCABLY SUBMIT TO THE JURISDICTION OF BOTH SUCH COURTS IN RESPECT OF ANY SUCH ACTION OR PROCEEDING.

SECTION 3.11. Waiver of Jury Trial. EACH OF THE PARTIES HERETO HEREBY WAIVES TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY WITH RESPECT TO ANY LITIGATION DIRECTLY OR INDIRECTLY ARISING OUT OF, UNDER OR IN CONNECTION WITH THIS AGREEMENT OR ANY OF THE TRANSACTIONS CONTEMPLATED HEREBY. EACH OF THE PARTIES HEREBY (A) CERTIFIES THAT NO REPRESENTATIVE, AGENT OR ATTORNEY OF THE OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER AND (B) ACKNOWLEDGES THAT IT HAS BEEN INDUCED TO ENTER INTO THIS AGREEMENT AND THE TRANSACTIONS CONTEMPLATED BY THIS AGREEMENT, AS APPLICABLE, BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS AND CERTIFICATIONS IN THIS SECTION 3.11.

SECTION 3.12. Severability. If any provision of this Agreement shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

SECTION 3.13. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, and all of which shall constitute one and the same agreement.

SECTION 3.14. Headings. The heading references herein and in the table of contents hereto are for convenience purposes only, do not constitute a part of this Agreement and shall not be deemed to limit or affect any of the provisions hereof.

SECTION 3.15. Joinder. Any Person that holds Company Shares may, with the prior written consent of the Institutional Investors, be admitted as a party to this Agreement upon its execution and delivery of a joinder agreement, in form and substance acceptable to the Institutional Investors, agreeing to be bound by the terms and conditions of this Agreement as if such Person were a party hereto (together with any other documents the Institutional Investors determine are necessary to make such Person a party hereto), whereupon such Person will be treated as a Holder for all purposes of this Agreement.

SECTION 3.16. Effectiveness. This Agreement shall become effective on the day immediately preceding the date on which a registration statement on Form 8-A, or any successor form thereto, with respect to the Company Shares first becomes effective under the Exchange Act. Until such time as this Agreement becomes effective, the Original Registration Rights Agreement shall remain in full force and effect. This Agreement shall automatically terminate if the Underwriting Agreement is terminated for any reason prior to the completion of the IPO or the IPO contemplated by the Underwriting Agreement is not consummated on or before the tenth (10^{th}) Business Day following the date of this Agreement, provided, that Section 3.17 shall survive any such termination.

SECTION 3.17. Reinstatement of Original Registration Rights Agreement. The parties hereto hereby agree that in the event this Agreement becomes effective but is subsequently

terminated pursuant to Section 3.16, the parties shall either reinstate the Original Registration Rights Agreement or execute a registration rights agreement with terms that are substantially equivalent (to the extent practicable) to, *mutatis mutandis*, the terms of the Original Registration Rights Agreement.

[*Remainder of Page Intentionally Blank*]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

CERTARA, INC.

By: /s/ William F. Feehery
Name: William F. Feehery
Title: Chief Executive Officer

[Signature Page to Amended and Restated Registration Rights Agreement]

INSTITUTIONAL INVESTORS:

EQT AVATAR PARENT L.P.

By: EQT Avatar Parent GP LLC, its general partner

By: /s/ Ethan Waxman
Name: Ethan Waxman
Title: Vice President

[Signature Page to Amended and Restated Registration Rights Agreement]

Schedule A

INSTITUTIONAL INVESTOR	FOR PURPOSES OF SECTION 3.04, WITH A COPY (WHICH SHALL NOT CONSTITUTE NOTICE) TO:
EQT Avatar Parent L.P. c/o EQT Partners Inc. 1114 Avenue of the Americas, 45th Floor New York, NY 10036 Fax: [ ] Attention: Eric Liu Email: [ ]	Simpson Thacher & Bartlett LLP 2475 Hanover Street Palo Alto, CA 94304 Fax: [ ] Attention: William Brentani Email: [ ]

Schedule B

HOLDER	FOR PURPOSES OF SECTION 3.04, WITH A COPY (WHICH SHALL NOT CONSTITUTE NOTICE) TO:
Arsenal Capital Partners III LP c/o Arsenal Capital Management LP 100 Park Avenue, 31st Floor New York, New York 10017 Attention: Gene Gorbach Fax: [ ] Email: [ ]	DLA Piper LLP (US) 1251 Avenue of the Americas 27th Floor New York, New York 10020 Fax: [ ] Attention: Daniel J. Eisner Email: [ ]
Arsenal Capital Partners III-B LP c/o Arsenal Capital Management LP 100 Park Avenue, 31st Floor New York, New York 10017 Attention: Gene Gorbach Fax: [ ] Email: [ ]	DLA Piper LLP (US) 1251 Avenue of the Americas 27th Floor New York, New York 10020 Fax: [ ] Attention: Daniel J. Eisner Email: [ ]
Sampension Private Equity K/S Tuborg Havnevej 14 2900 Hellerup Denmark	
Howard Hughes Medical Institute 4000 Jones Bridge Road Chevy Chase, MD 20815-6789 Tel: [ ] Fax: [ ] Attention: Mark Sproles, Director Private Placements Email: [ ] [ ]	
Santo Holding (Deutschland) GmbH c/o ATHOS KG Bergfeldstrasse 9 83607 Holzkirchen Germany Attention: Stephan Sperber Email: [ ]	honert + partner mbB Theatinerstr. 14 (Fünf Höfe) 80333 Munich Germany Fax: [ ] Attention: Sven Fritsche Email: [ ]

HOLDER	FOR PURPOSES OF SECTION 3.04, WITH A COPY (WHICH SHALL NOT CONSTITUTE NOTICE) TO:
Monte Rosa Opportunities, SICAV-SIF, in relation to its segregated compartment Monte Rosa Co-Investments III c/o FundPartner Solutions (Europe) SA 15, Avenue J.F. Kennedy L-1855 Luxembourg Email addresses to be copied for each notice sent to Monte Rosa Opportunities, SICAV-SIF, in relation to its segregated compartment Monte Rosa Co-Investments III: [ ] [ ] [ ] [ ] [ ] [ ]	
Pictet Private Equity Investors SA, as nominee on behalf of clients MMG Tower, 23rd Floor Ave. Paseo del Mar, Costa del Este Panama City, Republic of Panama For correspondence purposes: c/o Banque Pictet & Cie SA 60, route des Acacias 1227 Carouge, 1211 Geneva 73 Switzerland Attention: PAS Private Equity Funds Operations Email addresses to be copied for each notice sent to Pictet Private Equity Investors SA, as nominee on behalf of clients: [ ] [ ] [ ] [ ] [ ]	
Kirkbi Invest A/S Koldingvej 2 DK-7190 Billund Denmark	

26th September 2018.

Dr Robert Aspbury,
Low House Farm,
Timble,
Otley.
North Yorkshire.
LS21 2NN

Dear Rob,

Further to recent discussions, we would like to confirm our offer of employment with regard to a position with Certara UK Ltd - Simcyp Division (The "Company") and the details below set out the particulars of your employment that are required to be given to you under the Employment Rights Act 1996. Please sign, date and return this letter to confirm your agreement to the terms below.

Role

Your job title is Chief Operating Officer. ·You will be reporting to Dr Stephen Toon, President/Managing Director, or such other person as you shall be notified of from time to time. The main duties and responsibilities of your position are set out below. We may require you to perform other duties to meet the needs of the business.

Principal Duties include:

- Responsible for assuring execution of the business plans developed and owned by the business units
- Develops, establishes, and executes operating policies and procedures. consistent with the President's broad policies and objectives
- Collaborate with the executive team to develop and implement plans for the operational infrastructure of systems, processes, and personnel designed to accommodate the rapid growth objectives of the organization
- Advise executive team on key operational plans and make recommendations on critical business decisions
- Direct quality assurance program for internal operations
- Implement process improvement through business process reengineering initiatives
- Responsible for the measurement and effectiveness of all processes internal and external. Provide timely, accurate and complete reports on the operating condition of the company and establish performance monitoring systems.
- Ensure all business units are fully informed and adopt operational objectives
- Facilitate resolution of issues between Business Units and Functions·

Starting Date and Period of Continuous Employment

15th April 2019. No employment with a previous employer counts towards your continuous service.

Probationary Period and Performance Reviews

The first 6 months of your employment will be on a trial basis and the Company reserves the right to extend the trial period if it considers it appropriate to do so. You will be notified in writing if your probationary period has been satisfactorily completed.

Performance reviews are undertaken at least annually, and may be more frequent as requested by either the employee or their manager.

Salary
Your remuneration is £200,000 subject to deductions for tax and national insurance contributions payable by bank transfer, which will be paid monthly in arrears, normally on or about the last working day of the month.

Bonus
You will be entitled to participate in the Company's bonus scheme with a maximum bonus entitlement of 40% salary.

Signing-on/Retention Bonus
On successful completion of your 6-month probationary period you will receive a £75,000 signing on bonus and then on the anniversary date of that payment you will receive a £30,000 retention payment and a final payment of £24,000 twelve months following thatpayment date.

Equity
Effective upon the Start Date, Executive is hereby granted profits interests equal to such number of Class B Profits Interest Units of the equity of EQT Avatar Parent L.P., an indirect parent company of the Company ("Parent") and on the terms of the equity compensation plan of Parent, as may be in effect at the time of such option grant (the "Plan"), and a grant agreement ("Grant Agreement") on such terms as provided to other senior level executives of the Company, as more fully set forth in such Grant Agreement as has been provided. under separate. cover.

Pension (auto-enrolled)
The Company operates a stakeholder pension scheme that you will be automatically enrolled in to. Further details of the scheme are set out in a separate document available from the Human Resources Manager. At present, the Company contributes equivalent to 8% of your salary into the scheme. However, such payment is entirely at the Company's discretion and the Company reserves the right to amend or vary any such scheme at any time.

Private Medical Insurance Scheme (auto-enrolled)
The Company wants to ensure that you are able to receive prompt medical referrals and fast access to any medical treatment or assistance that you may require in the future and therefore provide a private medical insurance scheme via Vitality. Vitality also provide a range of rewards and discounts by engaging with their Vitality programme helping you to monitor your health and increase your welfare. Membership of the scheme is taxable, so an addition to your salary is made on a monthly basis and then a post-tax and NI deduction is made and paid over to Vitality. Failure to join the scheme or cessation of it for whatever reason does not entitle you to additional monies in lieu of this benefit. Further information can be gained from the Human Resources Manager.

Life Assurance Scheme (auto-enrolled)
As an employee of Certara, should you die before you retire, and whilst still employed by the company, your nominated beneficiaries will receive a Tax Free Lump sum of 2 x your plan earnings. Plan earnings are defined as your basic salary. The cover is provided by Lutine Assurance who are a well-known provider of insured group benefits and are of the

highest reputation. You will need to nominate your beneficiaries when you join the scheme.

Income Protection Scheme (auto-enrolled)
Sickness absence, particularly if prolonged, poses a serious financial problem for you and those who depend- upon you, as well as for the company. If your sickness absence exceeds that covered by the payments included in the sickness policy stated in your Offer Letter and the Staff Handbook, our policy with Zurich will help us to ensure you continue to receive a percentage of your income if you are unable to work because of illness or injury. This will help to support you during your absence and ease your return to work at the appropriate time. Payments are made in the same way you get your salary, so they will be subject to the same tax and National Insurance contributions.

Health Cash Plan (optional)
It is your option whether you join this scheme or not. Further details of the scheme are set out in a separate document available from the Human Resources Manager. At present the Company pays for the employee's entry into Level 2 of the Westfield Chamber Health plan. However, such payment is entirely at the Company's discretion and the Company reserves the right to discontinue, amend or vary any such scheme at any time and will not be liable to provide any replacement benefit of the same or similar kind or compensation in lieu of such benefit. As this is seen (in tax purposes) as a benefit in kind, the payment to the scheme is made via an enhancement of a staff member's monthly pay by the relevant amount, which is then taxed before a deduction is made from the staff member's monthly salary. It is possible to increase the level of cover under the scheme, but any increase is to be paid for by the member of staff directly and should such payments be required you must authorize such deductions to be made from your salary.

Direct Payments to Childcare Providers Scheme (optional)
Certara is a supporter of family friendly working methods. As such, it is your option whether you join the scheme. Direct Payments to Childcare Providers is a Government initiative designed to support working parents with their childcare costs. This is done via the Busy Bees Childcare Voucher Scheme. This gives an employee a cost saving. Further details can be obtained from the Human Resources Manager.

Ride to Work Scheme (optional)
The company has a partnership with Evans Cycles to enable employees to purchase a bicycle and/or equipment to enable them to cycle to work. The scheme offers substantial tax and NI savings of up to 42% on a bike, cycle clothing and equipment, with repayments via a monthly salary sacrifice arrangement.

Gymnasium/Sport Club Membership (optional)
You will be eligible to join the Gymnasium/Sport Club Membership scheme. Certara will contribute up to £20 (pre-tax / NI) per month for you to join any gymnasium or sport clubin your local area. Details will be provided by the Human Resources Manager during induction.

Hours of Work
Normal working hours are 35 hours per week, plus an hour for lunch, together with such additional time as is reasonably necessary for the proper performance of your duties.

Place of Work

Will be split between Simcyp's offices at Acero, 1 Concourse Way, Sheffield S1 2BJ and your home. Expenses for travel to Certara's other offices (including overnight accommodation if required) will be fully reimbursed.

Holiday Entitlement

The holiday year runs from 1st January to 31st December. The annual holiday entitlement is 25 days per calendar year based on a full time position, accruing at the rate of 1/12th of the total holiday entitlement, including service days but excluding. bank and statutory holidays, for each completed calendar month rounded to the nearest full day, excluding public and statutory bank holidays. Your entitlement will be pro-rated in the year of joining and leaving.

You must take your holidays at times convenient to the Company; hence dates must be agreed in advance with your Line Manager. No more than 2 weeks holiday can be taken together unless your Line Manager gives permission. Only a maximum of 5 days can be carried. over in to the following holiday year and must be taken by 30th June of the following holiday year, failing which they shall be forfeited.

You will be required to take any accrued holiday during any period of notice. If it is not possible, due to business requirements, for you to take the holiday in this period, you will be entitled to a payment in lieu of any accrued but untaken holiday on the termination of your employment. If at such time, you have taken holidays in excess of your entitlement we may deduct from your final salary an amount that is equal to the gross basic salary paid to you in respect of such holidays and you expressly consent to any such deductions pursuant to Part II of the Employment Rights Act 1996.

Sickness and Injury

If you are absent from work due to sickness or injury or other reason, you (or someone on your behalf) must inform your Line Manager and/or the Human Resources Manager of the reason for and likely duration of your absence no later than 10.00 am on the first day of absence. If your sickness absence lasts 7 calendar days or less, you must complete a self-certification form on your return to work. For absences lasting more than 7 calendar days, you must produce a medical certificate from your doctor stating the reason for your absence. Further medical certificates are required for each further period of sickness absence. We may require you to undergo a medical examination and the results of any such examination may be disclosed to us (to which you consent). Any unauthorised absence will be regarded as a disciplinary matter.

Subject to providing medical certificates, sick pay will be paid for a maximum of up to 130 days in any rolling period of 12 months. Any further payments will be made at the discretion of the directors. Sick pay entitlement is shown below:

Employment Period	Allowable Pay
Less than 1 year	up to 20 working days pay in any rolling 12 month period
1 - 4 years	up to 60 working days pay in any rolling 12 month period
4 or more	up to 130 working days pay in any rolling 12 month period

Notice

If you commit an act of gross misconduct you may be dismissed without notice. In other cases, if you wish to terminate your employment, you must give 6 calendar month's notice in

writing. If we wish to terminate your employment, you will be given 6 calendar month's notice.

Discipline and Grievance
The disciplinary and grievance rules applicable to you are set out in the Staff Handbook[1] as amended from time to time.

Disciplinary Procedure
If you are dissatisfied with any disciplinary decision taken in relation to you, you should appeal in writing within 5 working days of the decision to the person who made the decision or such other person as set out in the decision letter.

Grievance Procedure
If you have a grievance regarding your employment you should apply in writing to your manager in accordance with the grievance procedure set out in the Staff Handbook. If you are dissatisfied with the decision taken you should apply in writing within 5 working days of receiving their decision to the manager who dealt with the grievance or such other person as is set out in the decision letter.

Collective Agreements
There are no collective agreements which affect the terms and conditions of your employment.

Deductions
The Company may deduct from your salary any amount you owe to us and .you expressly consent to any such deductions pursuant to Part II Employment Rights Act 1996.

Prior Agreements
This letter forms the statement of particulars of your employment. It is in substitution for any previous contract of employment or other arrangements relating to your employment with the Company which are deemed to have been terminated by mutual consent with effect from the date of this letter.

Variations
It may be necessary from time to time to vary your terms of employment to which you consent on reasonable advance notice.

Intellectual Property Rights (IPR) and Restrictive Covenant
A separate document named 'Deed of Confidentiality' details both the confidential nature of our IP and the ownership rights, and is to be signed separately by you.

You may not during or after the termination of your employment disclose to anyone other than in the proper course of your employment any information of a confidential nature relating to the Company or its business or customers. Breach of this clause may lead to dismissal without notice.

You may not without the prior written consent of the Company engage in any form of business or employment other than employment with the Company whether inside or outside your normal hours of work. In the event that permission is granted for you to engage fn alternative employment you must notify us of the hours worked each week.

You consent to the covenants contained in the schedule attached to this letter and insigning the letter you agree to abide by them.

I hope the above is acceptable to you but of course you may contact me should you have any questions. Would you please sign and return to me 1 copy of both this letter and the Deed of Confidentiality as acknowledgement of, and agreement to, their respective terms and conditions and confirmation that you agree to abide by the provisions of the Staff Handbook and any updates to it.

Yours faithfully
For Certara UK Limited.

/s/ Dr. Stephen Toon — 16th October 2018.
Dr. Stephen Toon
President/Managing Director

I accept the above terms and conditions

/s/ Dr. Robert Aspbury — 10th October 2018
Dr. Robert Aspbury

CERTARA

Schedule of Restrictive Covenants

1. In this clause:

   1.1 "Restricted Business" means the business of the Company at the time of the termination of the employment with which you were involved to a material extent at any time within the period of 6 months ending on the date of the termination of your employment.

   1.2 "Restricted Customer" means any firm, Company or other person who at any time within the period of 6 months ending on the date of the termination of your employment was a customer of the Company and with whom you had contact in the course of your employment.

   1.3 "Restricted Employee" means any person whom at the date of the termination of your employment was employed by the Company.

   1.4 "Prospective Customer" means any firm, Company or other person who at any time within the period of 6 months ending on the date of the termination of your employment had expressed an interest in working with the Company and with whom you had knowledge of,

   1.5 "Termination" means the lawful termination by the Company of your employment and the termination .for whatever reason by you of your employment.

2. You will not, without first applying in writing to the Company for permission to do so and obtaining the Company's written consent, for a period of 12 months after the termination of your employment:

   2.1 Solicit or endeavour to entice away from the Company the business or custom of a Restricted Customer or Prospective Customer with a view to providing services to that Restricted Customer or Prospective Customer in competition with the Restrictive Business.

   2.2 Provide services to or otherwise have any business dealings with any Restricted Customer or Prospective Customer in the course of any business concern that is in competition with the Restricted Business.

   2.3 In the course of any business concern which is in competition with a Restricted Business offer employment to or otherwise endeavour to entice away from the Company any Restricted Employee.

   2.4 Carry on business in competition with the Restricted Business wholly or partly in association, whether as a partner, an employer, employee, joint-venture or co• director or otherwise, with any Restricted Employee.

3. The obligations imposed on you by this clause extend to you acting not only on your own account, but also on behalf of any other firm, Company or other person and shall apply whether acting directly or indirectly.

4. For the purpose of this letter the following shall (without limitation) be considered as confidential information whether or not (in the case of documents) they are marked as confidential:

   4.1 lists and particulars of the Company's suppliers and customers;

   4.2 addresses and other details of the Company's employees;

   4.3 any document or other information which is marked as being confidential or is so described by the person giving it to you;

   4.4 any document or other information which you regard as being confidential or which a reasonable person knowing the matters which you know would regard as being confidential; other than any which is or comes into the public domain other thanthrough your default.

5. You likewise shall refrain from using and shall keep secret any secret or confidential information relating to or to the business of persons having dealings with the Company coming to your knowledge or the knowledge of the Company under conditions of secrecy or confidence.

6. The restrictions contained in this Schedule:

   6.1 are considered by the Company and you to be reasonable in terms of time and subject matter in order to protect the Company's developments, trade secrets, inventions, discoveries and business secrets but if any such restriction is subsequently held to be invalid or ineffective but would be valid or effective if some part or parts of it were deleted or amended by changing any specified period or service then such restriction shall be so amended and effective accordingly;

   6.2 are to be in addition to and not to derogate from or be in substitution for any duty or obligation that you may at any time have by virtue of any statute, rule of commonlaw or equity.

7. You covenant with the Company that before you agree to provide services to or accept employment an appointment or engagement from any third party you will notify the third party of the restrictions set out in this clause.

8. You covenant with the Company that you will perform and observe the covenants set out in this schedule so far as applicable and this clause shall be construed and is enforceable as separate covenants.

CERTARA | SIMCYP

20th December 2019

Dr Robert Aspbury,
Low House Farm,
Timble,
Otley.
North Yorkshire.
LS21 2NN

Dear Rob,
Further to recent discussions, we are pleased to confirm the associated changes to your employment terms as follows:
Base: Remains the same at £200,000
Bonus: 40% of Base Target and will be moved to the President bonus split mix for alignment {25% Total Company EBITDA and 75% BU EBITDA (Simcyp})
Equity: additional 1% approved in November 2019

Job Title
President, Simcyp

Reports to (title)
CEO of Certara

Responsibilities

- Perform as Managing Director of Simcyp;
- Help develop worldwide sales and marketing strategies for Simcyp;
- Lead the Simcyp consultancy practice;
- Provide strategic scientific support for the Simcyp products and services;
- Provide scientific support and strategic direction for sales and marketing personnel, applicationscientists and software support staff; and
- Lead the Simcyp Division/product lines management team;
- Responsibility for the line management of one or more members of the department

Effective Date
1st January 2020

Please sign and return one copy of this letter to Michele West as acknowledgement of, and agreement to,the respective terms and conditions. Please also retain a copy for your own files.

On behalf of Certara

/s/ Jodi Dickinson
Jodi Dickinson

I accept the above terms and conditions

/s/ Robert Aspbury
Rob Aspbury

Certara UK Limited, Simcyp, Division, Level 2-Acero, 1 Concourse Way, Sheffield, S1 2BJ
t +44 (0) 114 460 0200 I f: +44(0) 114 478 5600
Certara UK Limited. Registered In England & Wales: Company no, 4217235, Registered office:
One London Wall, 6th Floor, London, EC2Y 5EB, UK

Subsidiaries of the Registrant

Name of Subsidiary	Jurisdiction of Incorporation or Organization
Analytica LA-SER International, Inc.	Delaware
Certara Canada Corporation	Canada
Certara Germany GmbH	Germany
Certara Holdco, Inc.	Delaware
Certara G.K.	Japan
Certara, L.P. - Sucursal em Portugal	Portugal
Certara Netherlands B.V.	Netherlands
Certara S.a.r.l.	Luxembourg
Certara UK Limited	United Kingdom
Certara USA, Inc.	Delaware
Synchrogenix Information Strategies LLC	Delaware
Synchrogenix Philippines, Inc.	Philippines

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statement on Form S-8 (No. 333-251368) of Certara, Inc. and Subsidiaries of our reports dated March 1, 2022, with respect to the consolidated balance sheets of Certara, Inc. and Subsidiaries (the "Company") as of December 31, 2021 and 2020, and the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes (collectively, the "consolidated financial statements"), and the effectiveness of internal control over financial reporting as of December 31, 2021, which reports appear in the December 31, 2021 Annual Report on Form 10-K of Certara, Inc. and Subsidiaries.

Our report dated March 1, 2022, on the consolidated financial statements, refers to the Company's change in its method of accounting for leases effective January 1, 2021, due to the adoption of Financial Accounting Standards Board Accounting Standards Codification Topic 842, *Leases*.

Our report dated March 1, 2022, on the effectiveness of internal control over financial reporting as of December 31, 2021, expresses our opinion that the Company did not maintain effective internal control over financial reporting as of December 31, 2021 because of the effect of a material weakness on the achievement of the objectives of the control criteria and contains an explanatory paragraph that states that a material weakness has been identified and included in management's assessment related to information technology general controls ("ITGCs") were not designed and implemented over a cloud-based software system that supports the Company's project set-up and time submissions for services provided to the Company's customers. As a result, certain business process automated and manual controls were also considered ineffective because they relied on data and reports accumulated in such software system. These control deficiencies were a result of: information technology processes lacking adequate reviews and documentation to maintain effective controls related to access management, change management and complementary user-organization controls to those implemented at the Service Organization that hosts the software system.

/s/ CohnReznick LLP

Tysons, Virginia
March 1, 2022

Exhibit 31.1

RULE 13a-14(a) CERTIFICATION
CERTARA, INC.

CERTIFICATION OF CHIEF EXECUTIVE OFFICER (Principal Executive Officer)

I, William F. Feehery, certify that:

1. I have reviewed this annual report on Form 10-K of Certara, Inc.;

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

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

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

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

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

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

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

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's Board of Directors:

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

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

Date: March 01, 2022

/s/ William F. Feehery
William F. Feehery
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

RULE 13a-14(a) CERTIFICATION
CERTARA, INC.

CERTIFICATION OF CHIEF FINANCIAL OFFICER (Principal Financial Officer)

I, M. Andrew Schemick, certify that:

1. I have reviewed this annual report on Form 10-K of Certara, Inc.;

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

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

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

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

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

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

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

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's Board of Directors:

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

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

Date: March 01, 2022

/s/ M. Andrew Schemick
M. Andrew Schemick
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

STATEMENT PURSUANT TO
18 U.S.C. SECTION 1350
AS REQUIRED BY
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Certara, Inc. (the "Company") on Form 10-K for the year ended December 31, 2021, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, the undersigned, hereby certify that to the best of my knowledge:

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

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

March 01, 2022 /s/ William Feehery
William Feehery
Chief Executive Officer
(Principal Executive Officer)

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 32.2

STATEMENT PURSUANT TO
18 U.S.C. SECTION 1350
AS REQUIRED BY
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Certara, Inc. (the "Company") on Form 10-K for the year ended December 31, 2021, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, the undersigned, hereby certify that to the best of my knowledge:

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

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

March 01, 2022 /s/ M. Andrew Schemick
M. Andrew Schemick
Chief Financial Officer
(Principal Financial Officer)

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.