As confidentially submitted to the Securities and Exchange Commission on January 26, 2021
This draft registration statement has not been filed publicly with the Securities and Exchange Commission, and all information herein remains strictly confidential.
Registration No. 333-

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

FORM S-1
REGISTRATION STATEMENT
Under
The Securities Act of 1933

RECURSION PHARMACEUTICALS, INC.
(Exact name of Registrant as specified in its charter)

Delaware (State or other jurisdiction of incorporation or organization)	**2836** (Primary Standard Industrial Classification Code Number)	**46-4099738** (I.R.S. Employer Identification No.)

41 S Rio Grande Street
Salt Lake City, UT 84101
(385) 269-0203

Christopher Gibson
Chief Executive Officer
Recursion Pharmaceuticals, Inc.
41 S Rio Grande Street
Salt Lake City, UT 84101
(385) 269-0203

Copies to:

Patrick J. Schultheis **Philip H. Oettinger** **Jeana S. Kim** **Wilson Sonsini Goodrich & Rosati** **Professional Corporation** **701 Fifth Avenue, Suite 5100** **Seattle, WA 98104** **(206) 883-2500**	**Louisa Daniels,** **Chief Legal Officer** **Nathan Hatfield,** **Associate General Counsel** **Recursion Pharmaceuticals, Inc.** **41 S Rio Grande Street** **Salt Lake City, UT 84101** **(385) 269-0203**	**Alan F. Denenberg** **Stephen Salmon** **Davis Polk & Wardwell LLP** **1600 El Camino Real** **Menlo Park, CA 94025**

Approximate date of commencement of proposed sale to the public: As soon as practicable after the effective date of this Registration Statement.

If any of the securities being registered on this form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box. ☐

If this form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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 7(a)(2)(B) of the Securities Act. ☐

CALCULATION OF REGISTRATION FEE

Common Stock $0.00001 par value	$	$

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the Registration Statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

EXPLANATORY NOTE

Pursuant to the applicable provisions of the Fixing America's Surface Transportation Act, we are omitting our consolidated financial statements as of and for the year ended December 31, 2018 and our unaudited financial statements as of and for the nine months ended September 30, 2019 and 2020 because they relate to historical periods that we believe will not be required to be included in the prospectus at the time of the contemplated offering. We intend to amend the registration statement to include all financial information required by Regulation S-X at the date of such amendment before distributing a preliminary prospectus to investors.

Table of Contents

The information in this preliminary prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell nor does it seek an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED , 2021

Preliminary prospectus

Shares

Common Stock

This is the initial public offering of shares of common stock of Recursion Pharmaceuticals, Inc. We are offering shares of our common stock. The initial public offering price is expected to be between $ and $ per share.

Prior to this offering, there has been no public market for our common stock. We intend to apply to list our common stock on the Nasdaq Global Select Market under the symbol "RXRX."

We are an "emerging growth company" as defined under the federal securities laws and, as such, have elected to comply with certain reduced reporting requirements.

	Per share	Total
Initial public offering price	$	$
Underwriting discounts and commissions(1)	$	$
Proceeds to Recursion Pharmaceuticals, Inc., before expenses	$	$

(1) See "Underwriting" for a description of the compensation payable to the underwriters.

We have granted the underwriters an option for a period of 30 days to purchase up to additional shares of common stock.

Investing in our common stock involves a high degree of risk. See "Risk Factors" beginning on page 22.

Neither the Securities and Exchange Commission nor any other state securities commission has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

The underwriters expect to deliver the shares against payment in New York, New York to purchasers on or about , 2021, through the book-entry facilities of the Depositary Trust Company.

Goldman Sachs & Co. LLC **J.P. Morgan**

BofA Securities **SVB Leerink** **Allen & Company LLC**

KeyBanc Capital Markets

Prospectus dated , 2021

Table of Contents

Table of Contents

We are a Biotechnology Company Scaling More Like a Technology Company

56M+

Experiments in human cells conducted in our own laboratories

Nearly

7PB

At nearly 7 petabytes, one of the largest proprietary biological and chemical datasets

13B+

Inferred relationships between human genes, chemical compounds and more using our Map of biology

35

Total internally developed programs

4

Clinical stage programs

200+

Recursionauts united in one mission...

Table of Contents

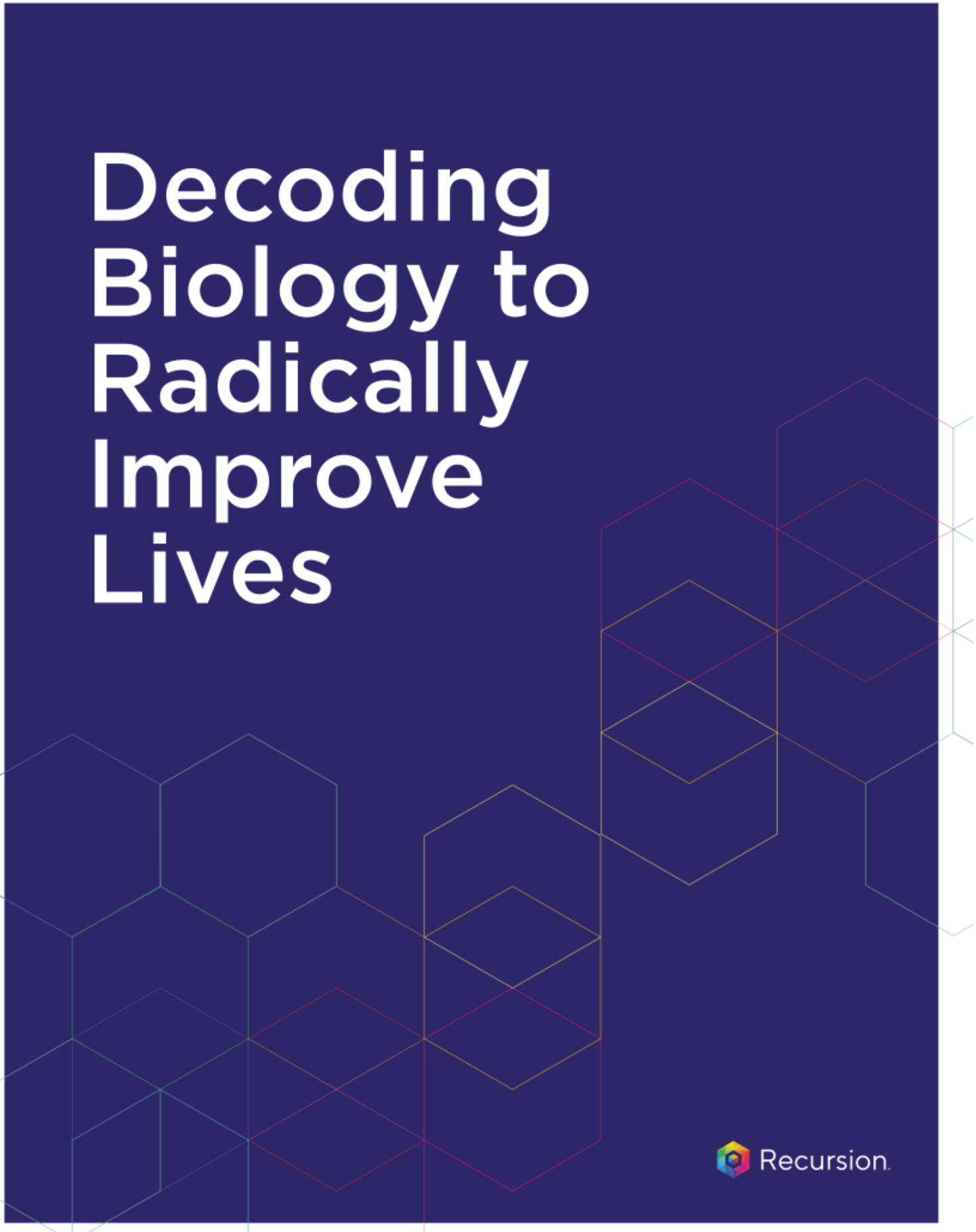


Table of Contents

A Letter from our Co-Founder and CEO

A LETTER FROM OUR CO-FOUNDER AND CEO

Dear Investor,

Our mission is to ***Decode Biology to Radically Improve Lives***. It is purposefully audacious, expansive and impactful. We are capitalizing on the once-in-a-lifetime near simultaneous convergence of exponential improvements in diverse areas of science and technology that will make this the century of biology.

The purpose of this letter is to share key ideas and principles with you that can be difficult to express, but that I believe are critical to the delivery of our mission. You should know what kind of company we are today and aim to become in the future as you consider joining our mission as a shareholder.

Biology Is Complex

Biology is enormously complex and highly networked. As a species, we so far only understand a tiny fraction of all there is to learn on the subject, despite millions of incredible scientists having dedicated their lives to uncover its truths. Further, much of biology may be too complex for any human to ever understand. Unraveling the complexity of biology is a path to better medicines.

In spite of the challenges, the accomplishments of the modern biopharmaceutical industry over the last 30 years are tremendous: antiviral compounds have transformed HIV/AIDS from a death sentence to a chronic condition and have cured more than one million patients with Hepatitis C; increasingly targeted chemotherapeutics and a new exciting generation of immune therapies have helped millions of cancer patients reach remission, see a child's wedding or enjoy a few more Thanksgiving meals with their family; antibody therapies like those targeting TNFa have meaningfully improved the quality of life for millions of patients; and today the world witnesses the roll-out of COVID-19 vaccines developed in record time. These examples are but a few of the hundreds of incredible new medicines made possible thanks to both basic and applied research, to the researchers who dedicate themselves passionately to science, and to the patients who continue to inspire us.

Despite these advances and the incredible work of scientists all over the world, an inconvenient truth remains: more than 90% of drugs that have advanced into clinical trials failed before they made it to the market. Even today, thousands of diseases affecting hundreds of millions of people have no effective treatment. Meaningfully accelerating the pace, broadening the scale and decreasing the cost of bringing effective, new medicines to the patients who need them is one of the greatest challenges and largest opportunities for humanity.

Leveraging Technology for Scale and Complexity Is How We Find the Unexpected

Biological systems may be complex, but they are not fundamentally unsolvable. Over just the last five years we have witnessed exponential advancements in the toolsets used in diverse technical fields including i) increasing control over biology with tools such as CRISPR genome editing and synthetic biology; ii) rapidly advancing robotics enabling reliable automation of complex tasks at unprecedented scale, including biological experimentation; iii) new computational techniques leveraging new neural network architectures enabling iterative analysis of, and inference from, very large, complex and incomplete datasets; and iv) the increasing elasticity of high performance computation thanks to cloud solutions. The simultaneous convergence of rapid advancements and improvements in these fundamental areas has created the milieu for a revolution in the discovery and development of new medicines.

The core principle of our approach to improving the scale and efficiency of drug discovery is to automate and integrate the wet lab to create massive empirical datasets of biology and the dry lab where we leverage machine learning, or ML, to unravel the complex patterns within our datasets. No static dataset could likely contribute meaningfully to solving disease biology; the secret is the iterative approach where the learnings of prior data inform the generation of new data, and the secret to that approach is to generate our own data in-house. Our dataset, fit for the purpose of machine learning, grows by approximately 80 terabytes each week, and thus algorithms can be improved exponentially faster than if applied to a static dataset.

Further, our approach allows us to eschew human bias, which is often a major threat to the drug discovery process. As humans, we are limited in the size and scale of data we can interpret and we are prone to seeing the data that suits us and justifies our hypothesis. While today our ML processes lack all the intuition of a savvy drug-hunter, the algorithm cares not for the hypothesis.

Our People & Culture Are Our Foundation

What I underestimated most in the early days of Recursion was not biology or fundraising, but the challenges of hiring great people and turning them loose on difficult problems across so many varied technical fields. Thanks to incredible mentorship, brilliant co-founders, and some fantastic early hires, the importance of creating an *environment* of diversity, inclusion, curiosity, learning, integrity and boldness was emblazoned in us early. We have invested heavily in our people since the early days, for no amount of infrastructure or code will enable us to achieve our mission without them. More than seven years in, we now have a thriving community where data scientists, software engineers and automation engineers mingle with their colleagues in biology, chemistry and clinical development and where together we work on incredibly hard problems, united by our mission.

What We Can Learn from Other Industries

Over the past two decades, we have all watched the proliferation of technology across industry after industry. Established and entrenched companies with long and distinguished histories have been all but forgotten thanks to a new breed of approach.

By combining a reliable source of data at scale with systems, processes, and algorithmic approaches, an electronic bookseller took on traditional retail, a video-by-mail service became one of the most powerful forces in entertainment and a small electric car maker leapt a decade ahead of the rest of the auto industry. In each case, the company cornered a small niche of a market and then leveraged data and technical savvy to grow more quickly than most thought possible. Further, as they integrated new datasets at scale, network effects took hold and the power of their approach accelerated exponentially. By the time their competitors realized and reacted to what was happening, they were at a distinct disadvantage.

Similarly, we started small by focusing on quietly building one of the largest and fastest-growing biological image datasets on Earth, along with the systems, processes and algorithms to explore it in the context of a niche set of rare diseases. This initial approach has led to a pipeline of drug candidates far broader than that of traditional biopharmaceutical companies of a similar age and size.

In just the last year, we have started to take all that we have learned to begin to scale the creation of additional datasets, and to begin to focus on building the systems, processes and algorithms of integration and relation among and between them. As network effects take hold, the power of our approach will accelerate exponentially. And we won’t stop with discovery; we will leverage new technology and our ethos of creating virtuous cycles of learning around datasets to build a next generation, integrated, and verticalized biopharmaceutical company.

Many believe that the disruptive changes seen in other industries over the past two decades will not happen in biopharmaceuticals; the space is too complex and highly regulated. It is certainly not surprising that this is among the last industries to experience these changes, but it is not immune. In fact, the industry has endured such cycles of technological disruption before; in the 1980s new data and technology allowed us to dissect molecular pathways, and again in the late 1990s and 2000s as biologics began to flourish. This cycle has happened previously, and the stakes are high: there are few other industries where more than a dozen companies have market capitalization of over $100 billion, fewer industries still where their products fail 90% of the time during development and none with the same potential for impact. The cycle will happen again.

The Recursion Map of Human Cellular Biology Predicts Billions of Relationships

We have built a map of human cellular biology that enables us to predict relationships and interactions among and between various elements of biology and chemistry at scale and speed. Further, we have focused on controlling our own vertical; our predictions can be validated experimentally in our own labs, translated through animal models in our own vivarium, and developed through the clinic by our own team.

Over the coming decades we will continue to build at the intersection of the physical world and the digital world, creating virtuous cycles of data generation, analysis, and iteration across not only drug discovery, but clinical development and manufacturing, as well as across therapeutic modalities and indications. This approach has given rise to the creed of Recursion:

Build the Map
Follow the Map
Serve Patients

Those eight words serve as both the compass by which we navigate, and also for you, an investor, a pithy distillation of our strategy.

Our Pioneering Spirit and Underdog Mentality Remain

From our earliest days, our story was unlikely. We are a company started by two graduate students and a professor, headquartered in Salt Lake City, Utah. Like many early tech companies, we were first funded by cash advances on a credit card, savings and friends and family that believed in us. We bought used equipment from a defunct laboratory in San Diego, loaded it in a moving van, and drove through the night back to our ~~closet~~ lab to get started.

Our humble and unlikely beginnings are foundational to what we've built today. We were underdogs, and felt that way. Now we are leaders in this space, but we will stay hungry and focused. We will operate as underdogs each and every day, surprising those who underestimate us.

We Lead with Data and Demonstrables

Today, the principles of our approach remain largely unchanged from what we began with in 2013. In just over seven years we have built or demonstrated:

- One of the largest proprietary biological datasets on earth.
- One of the largest, broadest and deepest pipelines of any technology-enabled drug discovery company.

- A transformational partnership with Bayer where we seek to discover more than 10 new treatments for fibrosis in the next five years.
- An incredible team of over 200 Recursionauts, with world class talent, expertise and leadership, and with an incredible culture of caring, learning, delivery and acting boldly with integrity as *One Recursion.*

We are a biotechnology company scaling more like a technology company, and we are just getting started.

An Invitation to Join Us and Our Commitment to You

You can invest in many companies, and thankfully, many great technologists are turning their attention to advancing missions that matter for humanity. The future is bright.

In the pages that follow, you will read a great deal about the company our team has built. We have included a wide range of facts and figures because at Recursion we lead with data and demonstrables, always. You will read about how the Map we have built is demonstrating meaningful leading indicators of industrializing drug discovery and development. We hope that whether you are a technology investor, a healthcare investor or a generalist investor, you find elements of our story that speak to you and you are excited by our ambitious mission and progress over the past seven years.

But we also hope that you consider the kind of company we are trying to build and how we will swing for the fences to make a meaningful impact on millions of people; we will never become complacent with the pipeline we have built, the Map we have built, or with moderate successes. We will dare greatly.

There will undoubtedly be many bumps in the road and there will be failures; biology and chemistry are ***hard***. In the war to industrialize a process as complex and costly as the discovery and development of new drugs, inevitably we will lose battles, but we will always keep sight of the mission. Should you join us, expect to experience both our setbacks and our successes and know that we learn from both, and perhaps most from our failures.

Finally, know that our ambition is not limited just to the discovery of medicines, for we have proven to ourselves our ability to make a Map of human cellular biology, and as such, we would be foolish not to map other elements of biology. Ultimately there is not *one* Map, but many, and we are the company that can build them and consolidate them, extending our creed one day well beyond biopharmaceuticals:

Build The Atlas
Follow The Atlas
Serve Humanity

Our commitment to you is that our dedicated team will work boldly and with urgency to achieve our mission. We hope that through the words in these pages the spirit of Recursion comes through and that when you invest in us, you are investing as much in the impact this team and our mission can achieve as for the financial opportunity before us. Together, we can decode biology to radically improve lives.

Thank you,

Chris Gibson, Ph.D.

TABLE OF CONTENTS

Through and including , 2021 (the 25th day after the date of this prospectus), all dealers effecting transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to a dealer's obligation to deliver a prospectus when acting as an underwriter and with respect to an unsold allotment or subscription.

Neither we nor the underwriters have authorized anyone to provide you any information or make any representations other than those contained in this prospectus or in any free writing prospectus prepared by or on our behalf, or to which we have referred you. We and the underwriters take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We and the underwriters are not making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus is accurate only as of the date on the front cover of this prospectus. Our business, financial condition, results of operations and prospects may have changed since that date.

For investors outside of the United States: we have not, and the underwriters have not, done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than the United States. Persons outside of the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of common stock and the distribution of this prospectus outside of the United States.

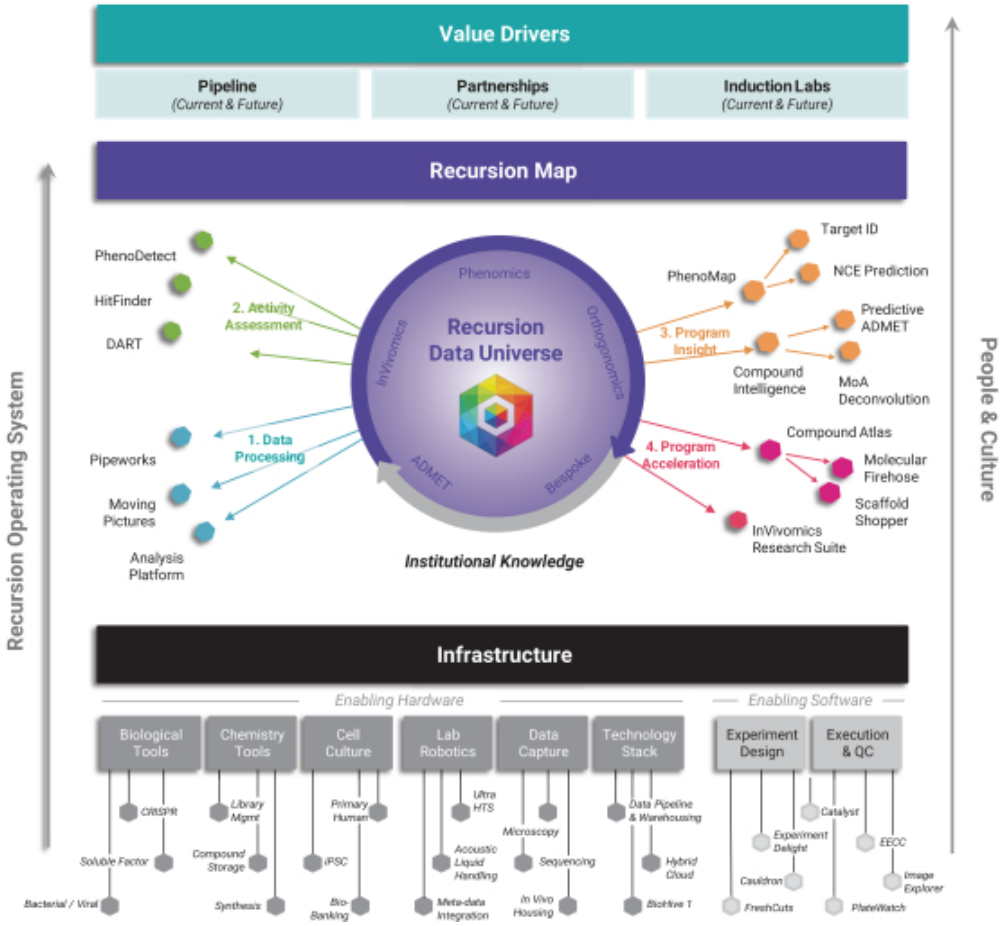
Prospectus Summary

PROSPECTUS SUMMARY

This summary highlights selected information contained elsewhere in this prospectus and is qualified in its entirety by the more detailed information and consolidated financial statements included elsewhere in this prospectus. This summary does not contain all of the information you should consider before investing in our common stock. You should carefully read this entire prospectus, including the information under the sections titled "Risk Factors," "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and related notes included elsewhere in this prospectus, before making an investment decision. Unless the context requires otherwise, references in this prospectus to "Recursion Pharmaceuticals," "Recursion," the "Company," "we," "us" and "our" refer to Recursion Pharmaceuticals, Inc.

Overview

We are a clinical-stage biotechnology company decoding biology by integrating technological innovations across biology, chemistry, automation, data science, and engineering to radically improve the lives of patients and industrialize drug discovery. Central to our mission is the Recursion Operating System, or Recursion OS, that combines an advanced infrastructure layer to generate what we believe is one of the world's largest and fastest-growing proprietary biological and chemical datasets and the Recursion Map, a suite of custom software, algorithmic, and machine learning tools that we use to explore foundational biology unconstrained by human bias, navigate to new biological insights, and rapidly accelerate programs. The combination of wet-lab biology and *in silico* tools in our closed-loop system accelerates our drug discovery process and differentiates us from others within the industry. Similarly, our balanced team of life scientists and computational and technical experts creates an environment where empirical data, statistical rigor, and creative thinking are brought to bear on every decision. Thus far, we have leveraged our Recursion OS to create three value drivers: i) a pipeline of 35 internally-developed programs focused on areas of significant unmet need, several of which have market opportunities in excess of $1 billion in annual sales, ii) strategic partnerships with leading biopharmaceutical companies, and iii) Induction Labs, a growth engine created to explore new extensions of the Recursion OS both within and beyond therapeutics. Our pipeline has doubled in size since 2019 and we expect to continue accelerating the pace of program additions in the future. As such, we are a biotechnology company scaling more like a technology company.

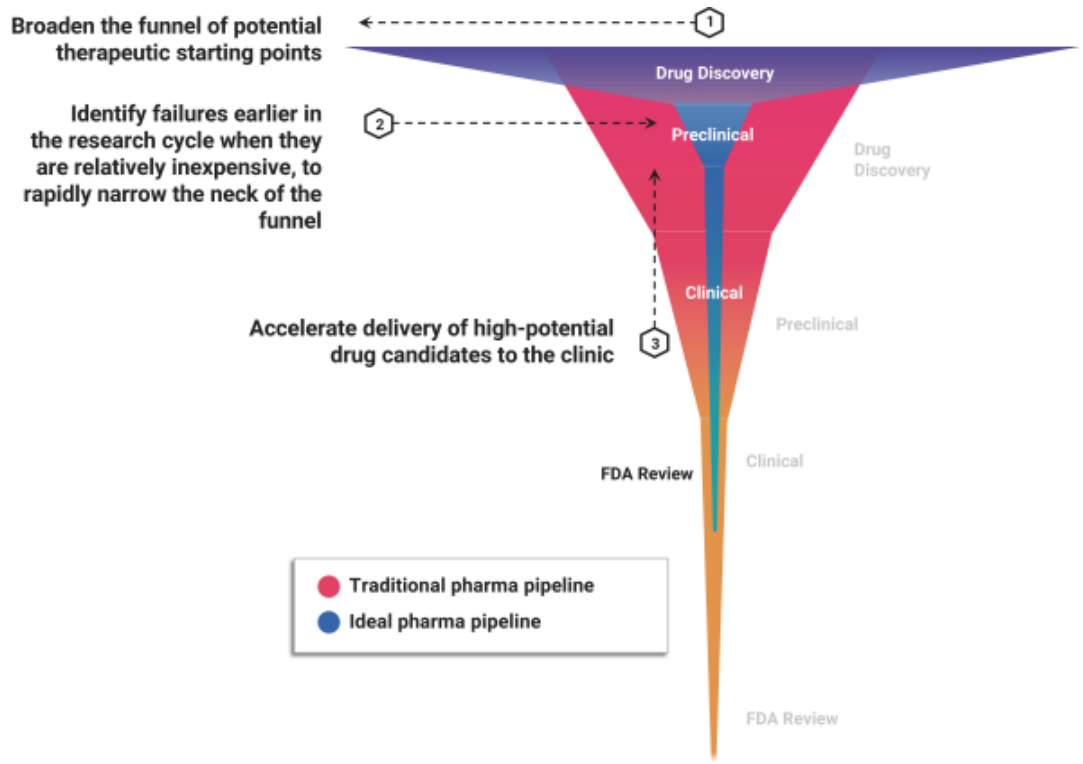


We believe we have demonstrated that our approach industrializes drug discovery, broadening the funnel of potential therapeutic starting points, identifying failures earlier in the research cycle when they are relatively inexpensive, and accelerating the delivery of high-potential drug candidates to the clinic while reducing cost. In mid-2020 we began transitioning from 'brute-force search' approaches, where we *physically test* every combination of disease model and drug candidate in our library using our automated wet-lab infrastructure, to a more efficient and even more powerful 'inferential search' approach. Under this new paradigm, we independently profile thousands of disease models and hundreds of thousands of drug candidates and then infer tens of billions of biological and chemical relationships *in silico*, prioritizing the most promising candidates for further validation. Ambitious explorations that would have taken us approximately 1,000 years to execute using our current throughput with brute-force search can now be *inferred* in a matter of months. This transition marks early progress towards realizing our founding vision – converging massive biological and chemical datasets and modern machine learning, or ML, algorithms to drive the unbiased discovery of novel therapeutics at a pace and scale beyond what could be studied or explored in the physical world.

Year	2017	2018	2019	2020
Total Phenomic Experiments (Millions)	2.2	7.6	23.9	55.6
Data (PB)	0.5	1.8	4.3	6.8
Cell Types	7	12	25	36
Unique Perturbations[1] (Millions)	0.02	0.1	0.5	1.3
Total Chemical Library (Thousands)	3	24	106	706
Inferential Relationships[2] (Billions)	NA	NA	NA	13
Clinical Assets	0	1	2	4
Cost Per Experiment[3] ($)	0.63	0.45	0.36	0.33

(1) 'Unique Perturbations' refers to the number of gene, soluble factor, cell, and/or compound combinations physically explored.
(2) 'Inferential Relationships' refers to the number of Unique Perturbations that have been predicted using our Recursion Map.
(3) 'Cost Per Experiment' refers to the average adjusted direct cost to perform one phenomic experiment (defined as one well per perturbation) and is inclusive of consumable, compound, and labor costs.

In its ideal state, a drug discovery funnel would be shaped like the letter 'T' where a broad universe of possible therapeutics could be narrowed immediately to the perfect candidate, which would advance through subsequent steps of the process quickly and with no attrition. Our goal is to leverage technology to reshape the typical drug discovery funnel towards its ideal state by broadening the funnel of potential therapeutic starting points, rapidly narrowing the funnel by identifying failures earlier in the research cycle when they are relatively inexpensive, and accelerating the development of high-potential drug candidates. Late-stage clinical failures are the primary driver of costs in today's pharmaceutical R&D model. Reducing the rate of costly, late-stage failures and accelerating the timeline from hit to clinical candidate would create a more sustainable R&D model.



We believe we have made progress in reshaping the traditional drug discovery funnel in the following ways:

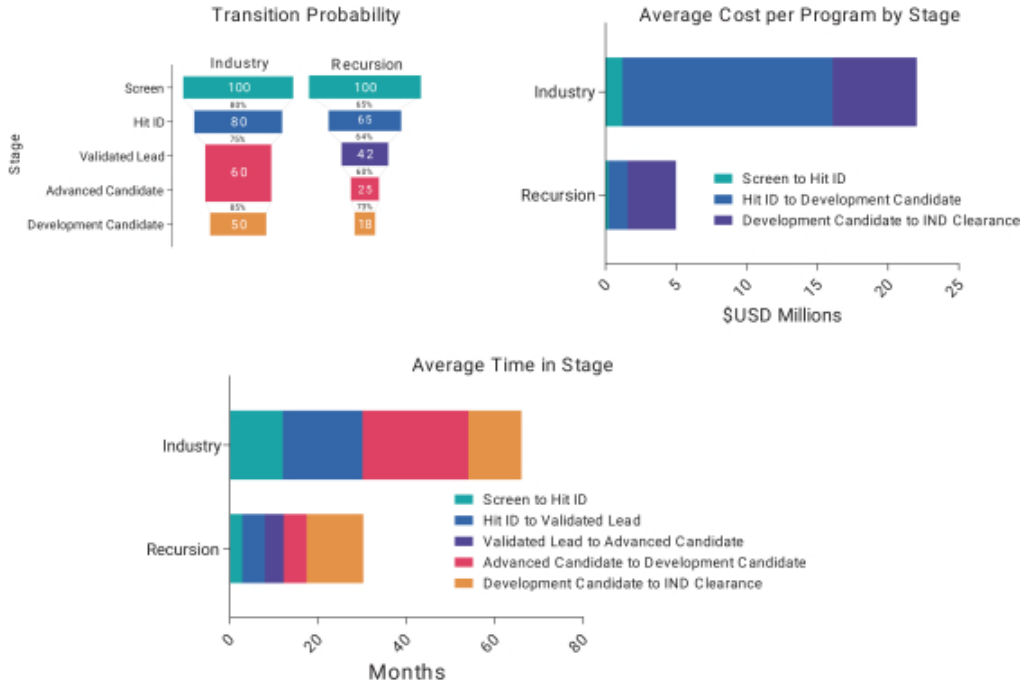
1. *Broaden the funnel of therapeutic starting points*. Our flexible and scalable infrastructure and our ability to use our *inference-based* Recursion Map to predict tens of billions of relationships between disease models and therapeutic candidates 'widens the neck' of the discovery funnel beyond hypothesized and human-biased targets.

2. *Identify failures earlier in the research cycle when they are relatively inexpensive, to rapidly narrow the neck of the funnel.* The Recursion Map combines massive biological and chemical datasets and computational tools that enable us to both i) select more highly translatable therapeutic starting points, and ii) predict select absorption, distribution, metabolism, excretion and toxicology, or ADMET, liabilities for drug candidates, rapidly prioritizing those programs with a higher likelihood of downstream success. Notably, this strategy not only results in an increase in early stage attrition, but we expect will also result in an overall lower cost of drug development.

3. *Accelerate delivery of high-potential drug candidates to the clinic*. The Recursion Map contains a suite of digital chemistry tools that enable highly efficient exploration of chemical space, including 3D virtual screening as well as translational tools that improve the robustness and utility of *in vivo* studies.

We have leveraged our evolving Recursion OS to explore many disease programs to a depth sufficient to quantify improvements in the time, cost, and anticipated likelihoods of program success by stage, compared to the traditional drug discovery paradigm. These metrics are leading indicators that, using our approach, we can industrialize drug discovery. We believe that future iterations of the

Recursion OS will enable even greater improvements. Ultimately, we look to minimize the total dollar-weighted failure while maximizing the likelihood of success in the clinic.



The Recursion OS

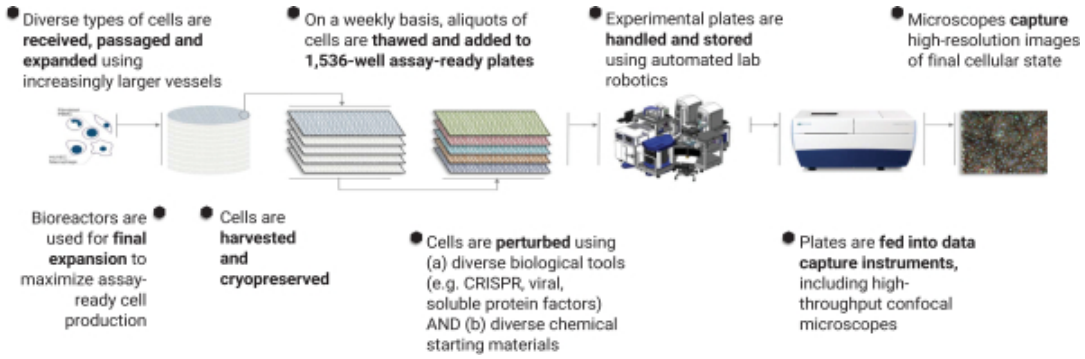
The Recursion OS is an integrated, multi-layer system for generating, analyzing, and deriving insights from biological and chemical datasets. It consists of three parts:

- *Infrastructure Layer:* A synchronized network of highly scalable enabling hardware and software used to design and execute diverse biological experiments and subsequently store our ever-growing datasets.
- *The Recursion Data Universe:* As of December 31, 2020, our Recursion Data Universe contained approximately seven petabytes of highly relatable biological and chemical data spanning multiple different data modalities. The size of the Recursion Data Universe has grown more than threefold since 2018 and has continued to grow at an accelerating rate. For context, our dataset already requires more storage capacity than all of the feature-length films in human history in high-definition, combined.
- *The Recursion Map:* A suite of in-house software tools, algorithms, and machine learning approaches designed to process and translate data from the Recursion Data Universe into actionable insights for our research and development teams.

The combination of wet-lab biology used to generate our proprietary dataset and *in silico* tools in our closed-loop system sets us apart in the field of tech-enabled drug discovery. Many companies in this space: i) leverage disparate, noisy and often irreproducible third-party datasets, which are poorly suited for ML, or ii) build tools “as a service” for others, which may limit their upside and impact over time. More importantly, our repetition of wet-lab validation and *in silico* predictions creates a flywheel effect, where

data generation and learning accelerate side-by-side and further strengthen our drug discovery platform. While emerging competitors and large well-resourced incumbents may pursue a similar strategy, we have two advantages as a first mover: i) no amount of resources can compress the time it takes to observe naturally occurring biological processes, and ii) the ever-growing Recursion Data Universe creates compounding network effects that may make it difficult to close the competitive gap.

While the Recursion Data Universe is composed of a variety of proprietary datasets, the core dataset is based on billions of labeled images of human cells generated across millions of unique perturbations using diverse biological tools generated in our own wet laboratories. Our expertise in developing this dataset serves as a foundation upon which we are building additional complementary scaled biological and chemical datasets.



Our People and Culture

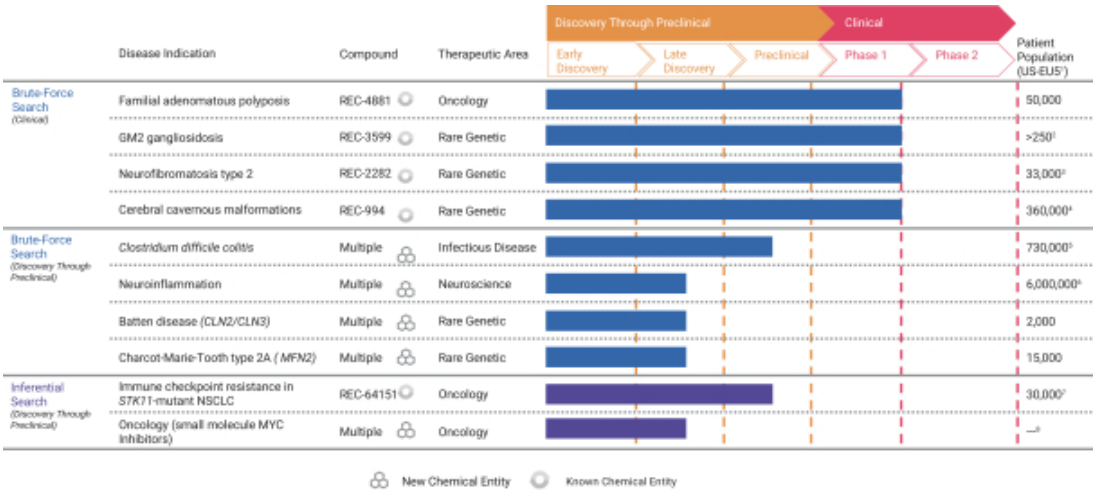
We operate at the intersection and cutting edge of science and technology. Unlike traditional biotechnology companies, our rapidly growing team of more than 200 'Recursionauts' is balanced between life scientists (approximately 40% of employees) and computational and technical experts (approximately 35% of employees), creating an environment where empirical data, statistical rigor, and creative thinking are brought to bear on the problems we address. While we are united in a common mission, *Decoding Biology to Radically Improve Lives*, our greatest strength lies in our differences: expertise, gender, race, disciplines, experience, and perspectives. Deliberately building and cultivating this culture is critical to achieving our audacious goals.

Our Value Drivers

We have used the Recursion OS to build three value drivers thus far: i) a pipeline of 35 internally-developed programs focused on areas of significant unmet need, several of which have market opportunities in excess of $1 billion in annual sales, ii) strategic partnerships with leading biopharmaceutical companies, and iii) Induction Labs, a growth engine created to explore new extensions of the Recursion OS both within and beyond therapeutics.

Our Pipeline

Every program at Recursion is a product of our Recursion OS. While we have 35 programs in our pipeline, we highlight ten 'Notable Programs' that are key, near-term value drivers given their individual market opportunities and the validation they provide for each generation of the Recursion OS.



(1) EU5 is defined as France, Germany, Italy, Spain and the United Kingdom. All numbers are prevalence unless otherwise noted.
(2) Worldwide prevalence.
(3) Annual US-EU5 incidence for all NF2-driver meningiomas.
(4) Hereditary and sporadic symptomatic population.
(5) 730,000 annual incidence in US-EU5. Initial clinical studies will focus on subsets of the total population with high rates of recurrent infection.
(6) Our program has the potential to address a number of indications within Neuroinflammation, including multiple neurodegenerative diseases totaling at least 6 million patients in the US. We intend to pursue a select subset of these indications in the future.
(7) Annual US-EU5 incidence.
(8) Our program has the potential to address a number of indications driven by *MYC* alterations. At this time, we have not finalized a target product profile for a specific indication.

Brute-Force Search Programs

Eight of our Notable Programs were identified using our brute-force search approach. Four of these programs are new uses of existing known chemical entities, or KCEs, that we have advanced to clinical development and for which we have obtained key enabling licenses. Another four of these programs are new chemical entities, or NCEs, that have been discovered and advanced in-house.

- **REC-4881 for the Treatment of FAP.** REC-4881 is an orally bioavailable, non-ATP-competitive allosteric small molecule inhibitor of MEK1 and MEK2 being developed to reduce tumor size in familial adenomatous polyposis, or FAP, patients and patients with somatic *APC*-mutant tumors. REC-4881 appears to be well tolerated, consistent with the intended use and a gut-localized PK profile in humans that is highly advantageous for FAP and potentially other tumors of the gastrointestinal tract. We expect to enroll the first patient in a Phase 2, double-blind, randomized, placebo controlled trial in .
- **REC-3599 for the Treatment of GM2 Gangliosidosis**. REC-3599 is an orally bioavailable, selective, potent small molecule inhibitor of protein kinase C, or PKC, and glycogen synthase kinase 3 beta, or GSK3ß, being developed for the treatment of GM2 Gangliosidosis. This molecule has demonstrated strong rescue of pathogenic biomarkers GM2 and lipofuscin levels in

cells derived from patients with multiple different mutations in either *HEXA* or *HEXB,* referred to as Tay-Sachs or Sandhoff Disease, respectively. We are currently generating additional pharmacodynamic data in a HEXB-mutant animal model of GM2 at the request of the FDA in anticipation of enrolling the first patient in an open-label Phase 2 trial in .

- **REC-2282 for the Treatment of NF2**. REC-2282 is a CNS-penetrant, orally bioavailable, small molecule histone deacetylase, or HDAC, inhibitor being developed for the treatment of *NF2*-driven meningioma and neurofibromatosis type 2. This molecule appears to be well tolerated, including in patients dosed for multiple years, and potentially has reduced cardiac toxicity that would differentiate it from other HDAC inhibitors. In contrast to approved HDAC inhibitors, REC-2282 is both CNS-penetrant and orally bioavailable. We expect to enroll the first patient in a Phase 2, double-blind, randomized, placebo-controlled study in .
- **REC-994 for the Treatment of CCM**. REC-994 is an orally bioavailable superoxide scavenger small molecule being developed for the treatment of cerebral cavernous malformations, or CCM. In Phase 1 single-ascending dose, or SAD, and multiple-ascending dose, or MAD, trials in healthy volunteers that we conducted, REC-994 demonstrated tolerability and suitability for chronic dosing. CCM is among the largest rare disease opportunities with approximately 360,000 symptomatic patients in the United States and EU5, and no approved therapies. We expect to enroll the first patient in a Phase 2, double-blind, placebo-controlled, safety, tolerability and exploratory efficacy study in .
- **Lead Molecules for the Treatment of C. difficile Colitis**. We have identified three lead NCEs (REC-163964, REC-164014, and REC-164067) with the potential to be orally active, gut-biased, small molecule *C. difficile* toxin inhibitors, which we have shown to be inhibitors of glucosyl transferase. These molecules have the potential to prevent recurrent disease and be used as secondary prophylaxis therapy in high risk patients with *C. difficile* infections, the leading cause of antibiotic-associated diarrhea and a major cause of morbidity and mortality. We are currently completing exploratory non-clinical safety studies to enable potential selection of a development candidate.
- **Lead Molecules for the Treatment of Neuroinflammation**. We have identified three lead NCEs (REC-648455, REC-648597, and REC-648677) with the potential to be first-in-disease, orally bioavailable, safe, CNS-penetrant, small molecule modulators of microglial activation. Microglial activation and neuroinflammation are hallmarks of neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease, and CNS inflammatory diseases such as multiple sclerosis. Small molecule modulators of microglial activation have the potential to reduce neuronal death associated with proinflammatory processes in neurodegenerative diseases and inflammatory diseases of the CNS. The project is in lead optimization.
- **Lead Molecules for the Treatment of Batten Disease**. We have identified three lead NCEs (REC-648190, REC-259618, and REC-648647) with the potential to be orally bioavailable, CNS-penetrant, disease modifying therapeutics for multiple subtypes of Batten disease. Batten disease is an autosomal recessive, neurodegenerative disease resulting from mutations in one of fourteen *CLN* genes. While rare, these disorders collectively represent the most prevalent pediatric neurodegenerative disease and demonstrate significant unmet need. This project is currently in lead optimization.
- **Lead Molecules for the Treatment of CMT2A**. We have identified four lead molecules (REC-64810, REC-648458, REC-1262, and REC-150357) with the potential to be first-in-disease, orally bioavailable, disease modifying molecules to slow or reverse the progression of the mitochondrial disease Charcot-Marie-Tooth type 2A, or CMT2A. CMT2A is a rare, autosomal dominant, peripheral nerve degenerative disease caused by mutations in the *MFN2* gene which leads to progressive muscle atrophy in the lower legs and hands. There are

no approved disease modifying therapies for CMT2A. This project is currently in lead optimization.

Inferential Search Programs

Two of our Notable Programs were identified since mid-2020 using our new inferential search approach. One of these programs is a new use of an existing KCE while the other is an NCE discovered and advanced in-house.

- **REC-64151 for the Treatment of Immune Checkpoint Resistance in *STK11*-mutant NSCLC.** We have identified a novel potential use for a clinical-stage, orally bioavailable small molecule to restore and improve sensitivity to immune checkpoint inhibitors in tumors harboring mutations in the tumor suppressor gene *STK11*. There are approximately 30,000 cases of *STK11*-mutant metastatic non-small cell lung cancer, or NSCLC, a year in the US and EU5, and these mutations have been shown to predict poor prognosis and resistance to immune checkpoint inhibitors, or ICI, specifically anti-PD-(L)1 therapies. There are currently no approved therapies developed to specifically modulate tumor response in *STK11*-mutant cancers. This program is currently in the dose-optimization phase.
- **MYC-Inhibitory Molecules for the Treatment of Solid and Hematological Malignancies.** We have identified multiple hit series using our inferential-search approach that have subsequently shown concentration-dependent activity in suppressing transcriptional activity downstream of MYC. Increased expression of MYC transcriptional target genes presents across oncology and up to 50% of cancers harbor alterations in MYC. Novel small molecules with the potential to suppress MYC-dependent activity could improve treatment of diverse tumors, especially those harboring mutations in genes directly implicated in MYC activation. There are currently no approved molecules that target MYC specifically. This program is currently in the hit-to-lead phase.

In addition to the Notable Programs highlighted above, we are actively exploring 25 additional programs which may prove to be drivers of our future growth. Using our inferential search approach, we have discovered and validated 16 of these programs since July 2020. Moving forward, we expect the vast majority of new additions to our pipeline will be discovered using our inferential search approach.

Our Partnerships

We are not alone in our mission to industrialize drug discovery and improve patient lives. Using our Recursion OS, we will continue to collaborate with leading biopharmaceutical companies who have the resources and experience to help us broadly explore diverse disease domains (e.g., fibrosis, neuroscience, oncology, immunology, and inflammation) and rapidly identify first-in-class or best-in-class therapeutic candidates.

In August 2020, we announced a multi-year, strategic partnership with Bayer in the area of fibrosis. Under the partnership, the parties agreed to initiate more than 10 discovery projects over a five-year period to identify novel therapeutics for devastating and complex fibrotic diseases across multiple organ systems including lung, liver, and heart. Bayer contributed approximately 500,000 compounds from its proprietary library and will provide deep scientific expertise throughout the partnership.

While our partnerships to date have focused on small molecule research, future partnerships may extend into large molecules and novel therapeutic modalities including gene therapies and cell therapies.

Our Strategy for Value Creation

We are a biotechnology company scaling more like a technology company. The near to medium-term elements of our business strategy align with our three key value drivers. We intend to:

- *Develop the Current Pipeline of Assets While Delivering Super-Linear Pipeline Growth.*
- *Execute on Strategic Partnerships to Maximize the Potential Value of Our Platform*.
- *Explore New Extensions and Business Opportunities Arising from the Recursion Map Through Induction Labs*.

If we are successful in our pursuit to industrialize drug discovery, we may have the opportunity to pioneer how and where value is allocated within the biopharmaceutical industry by: i) commanding more value while partnering programs much earlier in the discovery and development process, ii) addressing disease areas of high unmet need that are otherwise considered too small or unprofitable for traditional drug development, and iii) competing on innovation *and* speed-to-market in major therapeutic areas, securing a leadership position. We believe that success in these endeavors may lead to a lasting, positive, and transformative impact on patients' lives and the biopharmaceutical industry as a whole.

Risks Associated with Our Business

Our business is subject to numerous risks and uncertainties that you should consider before investing in our company. These risks are described more fully in the section titled "Risk Factors" in this prospectus. These risks include, but are not limited to, the following:

- We are a clinical-stage biotechnology company with a limited operating history.
- We have incurred significant operating losses since our inception and anticipate that we will incur continued losses for the foreseeable future.
- Even if we consummate this offering, our mission is broad and expensive to achieve and we will need to raise substantial additional funding.
- We have no products approved for commercial sale and have not generated any revenue from product sales.
- We or our current and future collaborators may never successfully develop and commercialize drug products, which would negatively affect our results of operation and our ability to continue our business operations.
- Our quarterly and annual operating results may fluctuate significantly in the future due to a variety of factors, many of which are outside of our control and may be difficult to predict.
- Our approach to drug discovery is unique and may not lead to successful drug products.
- Our drug candidates are in preclinical or clinical development, which are lengthy and expensive processes with uncertain outcomes and the potential for substantial delays.
- Although we intend to explore other therapeutic opportunities, in addition to the drug candidates that we are currently developing, we may fail to identify viable new drug candidates for clinical development for a number of reasons. If we fail to identify additional viable potential drug candidates, our business could be materially harmed.
- Our business and operations would suffer in the event of computer system failures, cyber-attacks, or deficiencies in our cybersecurity or the cybersecurity of third parties, suppliers, or service providers.

- If we are not able to develop new solutions and enhancements to our platform that keep pace with technological developments, our business and results of operations would be harmed.
- Defects or disruptions in our platform could result in diminishing our value and prospects.
- A pandemic, epidemic, or outbreak of an infectious disease, such as COVID-19, or other force majeure events, may materially and adversely affect our business and our financial results and could cause a disruption to the development of our drug candidates.
- If we fail to sufficiently manage and improve our technical hardware infrastructure we may experience errors, delays and other performance problems.
- We are subject to regulatory and operational risks associated with the physical and digital infrastructure at both our internal facilities and those of our external service providers and suppliers.
- We may seek to establish additional collaborations for clinical development or commercialization of our drug candidates, and, if we are not able to establish them on commercially reasonable terms, or at all, we may have to alter our development and commercialization plans.
- If we are unable to adequately protect and enforce our intellectual property and proprietary technology or obtain and maintain patent protection for our technology and products, or if the scope of the patent protection obtained is not sufficiently broad, our competitors could develop and commercialize technology and products similar or identical to ours, and our ability to successfully commercialize our technology and products may be impaired.
- If we are unable to protect the confidentiality of our trade secrets and know-how, our business and competitive position may be harmed.
- If we fail to comply with our obligations in the agreements under which we collaborate with or license intellectual property rights from third parties, or otherwise experience disruptions to our business relationships with our collaborators or licensors, we could lose rights that are important to our business.

Corporate Information

We were formed in Delaware as a limited liability company in November 2013 under the name Recursion Pharmaceuticals, LLC. In September 2016, we converted to a Delaware corporation and subsequently changed our name to Recursion Pharmaceuticals, Inc. Our principal executive offices are located at 41 S Rio Grande Street, Salt Lake City, UT 84101. Our telephone number is (385) 269-0203. Our website address is www.recursion.com. Information contained on the website is not incorporated by reference into this prospectus and should not be considered part of this prospectus.

We use the Recursion logo and other marks as trademarks in the United States and other countries. This prospectus contains references to our trademarks and service marks and to those belonging to other entities. Solely for convenience, trademarks and trade names referred to in this prospectus, including logos, artwork, and other visual displays, may appear without the TM symbol, but such references are not intended to indicate in any way that we will not assert, to the fullest extent possible under applicable law, our rights or the rights of the applicable licensor to these trademarks and trade names. We do not intend our use or display of other entities' trade names, trademarks, or service marks to imply a relationship with, or endorsement or sponsorship of us by, any other entity.

Implications of Being an Emerging Growth Company

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, as amended, or JOBS Act. We will remain an emerging growth company until the earliest to occur of: i) the last day of the fiscal year in which we have more than $1.07 billion in annual revenue; ii) the date we qualify as a "large accelerated filer," with at least $700 million of equity securities held by non-affiliates; iii) the date on which we have issued more than $1 billion in non-convertible debt securities during the prior three-year period; and iv) the last day of the fiscal year ending after the fifth anniversary of our initial public offering.

An emerging growth company may take advantage of relief from certain reporting requirements and other burdens that are otherwise applicable generally to public companies. These provisions include:

- presenting only two years of audited financial statements and only two years of selected financial data;
- an exemption from compliance with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act;
- reduced disclosure about our executive compensation arrangements in our periodic reports, proxy statements, and registration statements; and
- exemptions from the requirements of holding non-binding advisory votes on executive compensation or golden parachute arrangements.

As a result of this status, we have taken advantage of reduced reporting requirements in this prospectus and may elect to take advantage of other reduced reporting requirements in our future filings with the U.S. Securities and Exchange Commission. In particular, in this prospectus, we have provided only two years of audited financial statements and have not included all of the executive compensation-related information that would be required if we were not an emerging growth company.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards, delaying the adoption of these accounting standards until they would apply to private companies. We have elected to avail ourselves of this exemption from new or revised accounting standards, and, therefore, we will not be subject to the same new or revised accounting standards at the same time as other public companies that are not emerging growth companies or those that have opted out of using such extended transition period, which may make comparison of our financial statements with such other public companies more difficult. We may take advantage of these reporting exemptions until we no longer qualify as an emerging growth company, or, with respect to adoption of certain new or revised accounting standards, until we irrevocably elect to opt out of using the extended transition period. As a result, our financial statements may not be comparable to companies that comply with new or revised accounting standards as of public company effective dates.

THE OFFERING	
Common stock offered by us	shares.
Option to purchase additional shares	We have granted the underwriters an option for a period of 30 days to purchase up to additional shares of our common stock.
Common stock to be outstanding immediately after this offering	shares (or shares if the underwriters exercise their option to purchase additional shares in full).
Use of proceeds	We estimate that the net proceeds from this offering will be approximately $ million, or $ million if the underwriters exercise in full their option to purchase additional shares of common stock, assuming an initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. We currently intend to use the net proceeds from this offering, together with our existing cash and cash equivalents, as follows: to fund research and development activities including but not limited to the operation of our platform, drug discovery and research programs, and continued development of the programs in our pipeline, including designing and conducting preclinical studies and clinical trials, as well as funding infrastructure to support our pipeline; to fund the paydown of debt; and the remaining amounts to fund working capital, other general corporate purposes and strategic investments, including through Induction Labs. However, we do not have agreements or commitments for any investments at this time. See the section titled “Use of Proceeds” for more information.
Risk factors	See the section titled “Risk Factors” for a discussion of factors you should carefully consider before deciding to invest in shares of our common stock.
Proposed Nasdaq trading symbol	“RXRX”

The number of shares of our common stock to be outstanding after this offering is based on shares of our common stock outstanding as of December 31, 2020, and excludes:

- shares of common stock issuable upon the exercise of options outstanding as of December 31, 2020 with a weighted-average exercise price of $ per share;
- shares of common stock issuable upon the exercise of options granted after December 31, 2020 with a weighted-average exercise price of $ per share;
- shares of common stock issuable upon the exercise of warrants to purchase shares as of December 31, 2020;
- shares of common stock reserved for future issuance under our 2016 Equity Incentive Plan, as amended, as of December 31, 2020, which shares will be added to the shares to be reserved for future issuance under our 2021 Equity Incentive Plan, or 2021 Plan;
- shares of common stock reserved for future issuance under our 2021 Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of common stock reserved for future issuance under this plan; and
- shares of common stock reserved for future issuance under our 2021 Employee Stock Purchase Plan, or 2021 ESPP, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of common stock reserved for future issuance under this plan.

Unless otherwise indicated, this prospectus assumes or gives effect to the following:

- no exercise of outstanding options;
- no exercise by the underwriters of their option to purchase additional shares of common stock from us in this offering;
- the automatic conversion of all outstanding shares of our convertible preferred stock as of December 31, 2020, into an aggregate of shares of our common stock immediately prior to the completion of this offering; and
- the filing and effectiveness of our amended and restated certificate of incorporation and the adoption of our amended and restated bylaws, each of which will occur immediately prior to the completion of this offering.

SUMMARY CONSOLIDATED FINANCIAL DATA

The following tables set forth our summary consolidated financial data for the periods indicated. We have derived the consolidated statements of operations data for the years ended December 31, 2019 and 2020, and the consolidated balance sheet data as of December 31, 2020, from our audited consolidated financial statements included elsewhere in this prospectus. Our historical results are not necessarily indicative of the results that should be expected for any future period. You should read the following summary consolidated financial data together with the more detailed information contained in "Selected Consolidated Financial Data," "Management's Discussion and Analysis of Financial Condition and Results of Operations," and our consolidated financial statements and the related notes included elsewhere in this prospectus.

	Year Ended December 31,	
	2019	2020
	(in thousands, except share and per share data)	
Consolidated Statement of Operations Data:		
Revenue:		
Grant revenue	$ 608	$
Operating revenue	1,711	
Total revenue	2,319	
Operating expenses:		
Research and development expenses	45,809	
General and administrative	18,951	
Total operating expenses	64,760	
Loss from operations	(62,441)	
Other income, net	562	
Net loss and comprehensive loss	$ (61,879)	$
Net loss per share, basic and diluted(1)	$ (4.30)	$
Weighted average shares of common stock, basic and diluted	14,380,177	
Pro forma net loss per share, basic and diluted (unaudited)(2)	$ (0.96)	$
Pro forma weighted-average shares outstanding used in computing pro forma net loss per share, basic and diluted (unaudited)	64,746,144	

(1) See Note 11 to our consolidated financial statements appearing at the end of this prospectus for details on the calculation of basic and diluted net loss per share.
(2) Unaudited pro forma basic and diluted net loss per share were computed to give effect to the automatic conversion of all outstanding shares of convertible preferred stock into shares of common stock in connection with a qualified initial public offering, using the as-converted method as though the conversion had occurred as of the beginning of the period presented or the date of issuance, if later.

	As of December 31, 2020		
	Actual	Pro Forma(1)	Pro Forma As Adjusted(2)(3)
		(unaudited) (in thousands)	
Consolidated Balance Sheet Data:			
Cash and cash equivalents	$	$	$
Working capital(4)			
Total assets			
Total liabilities			
Convertible preferred stock			
Total stockholders' deficit			

(1) The pro forma balance sheet data gives effect to the automatic conversion of all outstanding shares of our convertible preferred stock into an aggregate of shares of our common stock which will occur immediately prior to the completion of this offering, resulting in an aggregate of outstanding shares of our common stock.

(2) The pro forma as adjusted column in the balance sheet data table above gives effect to i) the pro forma adjustments described in footnote (1) above and ii) the issuance and sale of shares of common stock in this offering at the initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us.

(3) Each $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease, as applicable, the pro forma as adjusted amount of each of our cash and cash equivalents, working capital, total assets and stockholders' deficit by $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase or decrease of 1.0 million shares in the number of shares offered by us at the assumed initial public offering price would increase or decrease, as applicable, each of our cash and cash equivalents, working capital, total assets, and stockholders' deficit by $ million. The pro forma as adjusted information set forth above is illustrative only and will depend on the actual initial public offering price and other terms of this offering determined at pricing.

(4) Working capital is defined as current assets less current liabilities. See our financial statements appearing elsewhere in this prospectus for further details regarding our current assets and current liabilities.

GLOSSARY

A Summary of Key Terms Used in this Prospectus

Biological Tools. Methods and physical reagents by which scientists can perturb biological states, especially to model disease. Examples in the Recursion Data Universe include: CRISPR-mediated gene editing, soluble factors (e.g., proteins, metabolites, and toxins), live viruses, and more.

Brute-Force Search. A process by which potential therapeutic agents are discovered through direct experimentation to evaluate large numbers of reagent/perturbation combinations (e.g., high-throughput screening of a million small molecules against ten cellular disease models, requiring 10,000,000 experiments). See the definition of Inferential Search for contrast.

Chemical Entity, Known and New (KCE, NCE). Classes of drug discovery programs evaluating candidate therapeutic agents that have either been previously investigated (Known Chemical Entity) in human preclinical and/or clinical trials, or not been previously investigated (New Chemical Entity) in human clinical trials. Known Chemical Entity programs evaluate candidate therapeutic agents for a different application than their original study and may provide a faster route to treatments. New Chemical Entities often represent a more robust opportunity for intellectual property protections such as composition of matter patents.

Chemistry Tools. The set of chemical therapeutic agents, including existing known chemical entities and *chemical starting points* for new chemical entity programs, to be applied in brute-force or inferential search; the infrastructure to store, synthesize, and analyze such small molecules and their derivatives; and the know-how and software, including digital chemistry and predictive ADMET, to progress such small molecules towards clinical candidacy.

Digital Chemistry. The use of computational methods to solve chemical problems in drug discovery. It includes using methods such as large-scale structural searches, protein target simulations, small molecule property calculations, and machine learning-based predictions to make decisions.

Drug Discovery Funnel. The process by which the large universe of potential therapeutic agents is sequentially filtered down to a small number of candidates with increasing likelihood to be clinically beneficial and have an acceptable safety and tolerability profile for patients. It includes various sequential stages of therapeutic advancement, including early and late discovery, preclinical research, and clinical development.

Discovery, Early and Late. Stages in the drug discovery funnel that are initiated once a potential therapeutic agent has demonstrated early experimental success or prediction in the case of inference (Early Discovery), or subsequent orthogonal experimental validation (Late Discovery).

Functional Readout. Refers to a type of experimental readout, in this case a complex physiological endpoint (e.g. cell viability, neuronal outgrowth, mitochondrial respiration, etc.). We utilize functional readouts, measured in our -omics and bespoke assays, to validate potential therapeutic agents.

High-Dimensional. A dataset or data source is considered high-dimensional if many independent numerical measurements are taken simultaneously that provide a largely holistic view of the underlying activity and state of a biological system. High-dimensional contrasts with low-dimensional, in which small numbers of numerical measurements are taken, providing a highly limited view of biological or chemical activity and state.

High-Throughput Screening. An approach to running drug discovery experiments at the scale of millions of chemical and biological perturbations. It is enabled by deploying tools such as robotics, automated monitoring systems, liquid handling devices, and integrated analysis pipelines.

Highly Relatable. A dataset is highly relatable if data is reproducible and comparable (through the application of proprietary control and reference strategies) across independent experiments, extended durations of time (months and years), and diverse biological or chemical tools (e.g. CRISPR to soluble factors to small molecules).

Industrialization. In the context of drug discovery, refers to super-linear growth through standardization of biological and chemical experimentation systems and technological analyses to create a pipeline with higher likelihoods of clinical success, lower cost, and faster timelines.

Inferential Search. A process by which potential therapeutic perturbations are discovered through ML-enabled predictions of future results based on prior experiments, for example relationships between therapeutic and disease perturbations. The number of experiments to be conducted is proportional to the sum of the sizes of the therapeutic and disease perturbation libraries (e.g., 1,000,010 for a million small molecules against ten cellular disease models). See the definition of Brute-Force Search for contrast.

Laboratory, Wet and Dry. A research environment set up to run scientific experiments. In a wet lab, physical tests are run using chemistry tools, biology tools and other experimental reagents. In a dry lab, inferences are drawn *in silico,* through computational programs, models or simulations (e.g., predictive ADMET).

Large Molecule. Refers to natural polymers comprising large numbers of small building blocks (e.g., RNA, protein, and antibody therapeutics and certain natural products).

Mechanism of Action. The specific biological interaction through which a therapeutic agent, such as a small molecule, exerts its beneficial effect. A target hypothesis attempts to select a mechanism at the beginning of discovery, whereas unbiased approaches may be able to discover novel, unexpected mechanisms.

Meta-Data. Data regarding the technical execution of an experiment rather than the result of the experiment itself, for example, physical conditions and reagent lots. Tracking meta-data is critical for generating highly relatable data and for the proper interpretation of high-throughput screening.

Omics. Various data capture and analysis methods whereby one can analyze biological signals with universal or very broad coverage (e.g., whole genome). Omics includes: phenomics (cell morphology), transcriptomics (levels of RNA), proteomics (protein expression patterns), and InVivomics (digitization of complex animal behavior). Given the central role of phenomics at Recursion, “orthogonomics” refers to -omics data that is orthogonal, or independent of phenomics.

Perturbation. The application of biological or chemistry tools to change the state of a biological system such as a cell type in culture, for example to model and generate biological states.

Petabyte. A quantity of data: 10^{15} bytes, 1,000 terabytes, or 1,000,000 gigabytes. Equivalent to approximately 500 billion pages of standard typed text or 125 million microscopy images.

Preclinical. A stage in the drug discovery funnel prior to clinical development. For KCE programs, those programs with human PK/PD and safety profiles supporting in-licensing and for which we are seeking a license. For NCE programs, programs executing toxicology and efficacy studies in pursuit of an IND in the desired indication.

Predictive ADMET. ADMET, or Absorption, Distribution, Metabolism, Excretion, and Toxicity, is an abbreviation for a set of assessments aimed at understanding drug liabilities, particularly focusing on implications for whole systems, organs, and organisms. Predictive ADMET are computational dry lab approaches for detecting and avoiding risk related to such liabilities.

Recursion Data Universe. Our collection of highly-relatable, proprietary, and high-dimensional datasets of biology and chemistry upon which the Recursion Map operates.

Recursion Infrastructure. Our synchronized network of highly scalable enabling hardware and enabling software to design, execute, aggregate, and store our massive biological and chemical datasets.

Recursion Map. Our software tools and algorithms that use our data to obtain insights more efficiently than testing everything in the lab, in order to drive actionable insights for our research and development teams.

Recursion Operating System, or Recursion OS. Our integrated, multi-faceted system for generating, analyzing, and deriving insight from massive biological and chemical datasets. It consists of the Infrastructure Layer, the Recursion Data Universe, and the Recursion Map, which collectively enable our industrialization of drug discovery.

Small Molecule. In contrast to large molecules, therapeutic agents not comprising polymers of repeated building blocks: typically under 900 Daltons in molecular mass. Most approved drugs fall into this category.

Super-Linear Growth. Growth with a rate that increases over time (e.g., doubling count every year, exponential growth). In drug discovery, it is a goal of industrialization. Contrast this with linear growth, which has a constant growth rate (e.g., increasing total number of programs by 2-fold per year).

Unbiased. Collections of data and analyses that reduce the amount of expected prior understanding of biology relevant to a given disease indication or biological question, such as the pursuit of new therapeutics. Unbiased contrasts with biased, in which human interpretation and expectations drive the data collected and analyses performed.

Validation. A process by which discoveries are confirmed to have efficacious potential in secondary and additional, independent, experimental approaches that are highly relevant to the specific disease indication of interest (see omics and in particular, orthogonomics).

Table of Contents

Risk Factors

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the risks described below, as well as the other information in this prospectus, including our consolidated financial statements and the related notes and "Management's Discussion and Analysis of Financial Condition and Results of Operations," before deciding whether to invest in our common stock. The occurrence of any of the events or developments described below could harm our business, financial condition, results of operations and growth prospects. In such an event, the market price of our common stock could decline, and you may lose all or part of your investment. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations.

Risks Related to Our Financial Position and Need for Additional Capital

We are a clinical-stage biotechnology company with a limited operating history.

We are a clinical-stage biotechnology company with a limited operating history. Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of risk. Since our inception in November 2013, we have focused substantially all of our efforts and financial resources on developing our drug discovery platform and initial drug candidates. We have no products approved for commercial sale and therefore have never generated any revenue from drug product sales, and we do not expect to generate any revenue from drug product sales in the foreseeable future. We have not obtained regulatory approvals to market any of our drug candidates and there is no assurance that we will obtain regulatory approvals to market and sell drug products in the future.

We have incurred significant operating losses since our inception and anticipate that we will incur continued losses for the foreseeable future.

We have incurred net losses in each year since our inception. Our net losses were $61.9 million and $ million for the years ended December 31, 2019 and 2020, respectively. We had an accumulated deficit of $ million as of December 31, 2020. Substantially all of our operating losses have resulted from costs incurred in connection with research and development efforts, including clinical studies, and from general and administrative costs associated with our operations. We expect our operating expenses to significantly increase as we continue to invest in research and development efforts and the commencement and continuation of clinical trials of our existing and future drug candidates. In addition, if we obtain marketing approval for any drug candidates, we will incur significant sales, marketing, and outsourced-manufacturing expenses. Once we are a public company, we will incur additional costs associated with operating as a public company. As a result, we expect to continue to incur significant and increasing operating losses for the foreseeable future. Our prior losses, combined with expected future losses, have had and will continue to have an adverse effect on our stockholders' deficit and working capital. Because of the numerous risks and uncertainties associated with developing pharmaceutical products and new technologies, we are unable to predict the extent of any future losses or when we will become profitable, if at all. Even if we do become profitable, we may not be able to sustain or increase our profitability on a quarterly or annual basis.

Even if we consummate this offering, our mission is broad and expensive to achieve and we will need to raise substantial additional funding. If we are unable to raise capital when needed, we would be forced to delay, reduce, or eliminate at least some of our product development programs, business development plans, strategic investments, or potential commercialization efforts.

We have ambitious plans to decode biology and deliver new drugs to the patients that need them. Our mission is broad, expensive to achieve and will require additional capital in the future. In addition,

the development of pharmaceutical products is capital-intensive. We have four clinical stage programs and 31 additional programs in various stages of preclinical development. We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the research and development of, initiate clinical trials of, and potentially seek marketing approval for, our drug candidates, and add to our pipeline what we believe will be an accelerating number of additional programs. In addition, depending on the status of potential regulatory approval, or if we obtain marketing approval for any current or future drug candidates, we could expect to incur significant expenses related to product sales, marketing, manufacturing and distribution. We may also need to raise additional funds sooner if we choose to pursue additional indications and/or geographies for our drug candidates or otherwise expand more rapidly than we presently anticipate. Furthermore, upon the closing of this offering, we expect to incur additional costs associated with operating as a public company. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we would be forced to delay, reduce, or eliminate certain of our research and development programs or potential future commercialization efforts.

We expect that the net proceeds from this offering, together with our existing cash and cash equivalents, borrowings available to us and short-term investments as of the date of this prospectus, will be sufficient to fund our operating expenses and capital expenditures for at least the next months. Our future capital requirements will depend on and could increase significantly as a result of many factors, including:

- the impact of any business interruptions to our operations, including the timing and enrollment of participants in our planned clinical trials, or to operations of our manufacturers, suppliers, or other vendors resulting from the COVID-19 pandemic or a similar public health crisis or other force majeure event;
- the scope, progress, results and costs of our current and future clinical trials and additional preclinical research for our programs;
- the number of future drug candidates that we pursue and their development requirements;
- the costs, timing, and outcome of regulatory review of our drug candidates;
- our ability to establish and maintain collaborations on favorable terms, if at all;
- the success of any collaborations that we may enter into with third parties;
- the extent to which we acquire or invest in businesses, products, and technologies, including entering into licensing or collaboration arrangements for drug candidates;
- the costs of preparing, filing, and prosecuting patent applications, maintaining, protecting, and enforcing our intellectual property rights and defending intellectual property-related claims;
- our headcount growth and associated costs as we expand our business operations and our research and development activities; and
- the costs of operating as a public company.

Identifying potential drug candidates and conducting preclinical development testing and clinical trials is a time-consuming, expensive, and uncertain process that takes years to complete, and we may never generate the necessary data or results required to obtain marketing approval and achieve product sales. In addition, our drug candidates, if approved, may not achieve commercial success. We anticipate that our commercial revenues, if any, will be derived from sales of products that we do not expect to be commercially available for many years, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives.

Any additional fundraising efforts may divert our management from day-to-day activities, which may adversely affect our ability to develop and commercialize our drug candidates and technologies, and we can provide no assurance that such funding will be available on terms that are acceptable to us, or at all.

Until such time, if ever, as we can generate substantial revenues, we expect to finance our cash needs through a combination of private and public equity offerings, debt financings, strategic collaborations, strategic alliances, and licensing arrangements. We do not have any committed external source of funds. Disruptions in the financial markets in general and more recently due to the COVID-19 pandemic may make equity and debt financing more difficult to obtain and may have a material adverse effect on our ability to meet our fundraising needs. We cannot guarantee that future financing will be available in sufficient amounts or on terms acceptable to us, if at all. Moreover, the terms of any financing may adversely affect the holdings or the rights of our stockholders and the issuance of additional securities, whether equity or debt, by us, or the possibility of such issuance, may cause the market price of our shares to decline. To the extent that we raise additional capital through the sale of common stock or securities convertible or exchangeable into common stock, your ownership interest will be diluted, and the terms of those securities may include liquidation or other preferences that materially adversely affect your rights as a common stockholder. The incurrence of indebtedness would result in increased fixed payment obligations and we may be required to agree to certain restrictive covenants, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell or license intellectual property rights and other operating restrictions that could adversely impact our ability to make capital expenditures, declare dividends, or otherwise conduct our business. We could also be required to seek funds through arrangements with collaborators or otherwise at an earlier stage than otherwise would be desirable and we may be required to relinquish rights to some of our technologies or drug candidates, future revenue streams, or research programs or otherwise agree to terms unfavorable to us. If we are unable to obtain funding on a timely basis, we may be required to significantly curtail, delay or discontinue one or more of our research or development programs or the commercialization of any drug candidate or be unable to expand our operations or otherwise capitalize on our business opportunities, as desired, which could materially affect our business, financial condition, and results of operations.

We have no products approved for commercial sale and have not generated any revenue from product sales.

Our ability to become profitable depends upon our ability to generate substantial revenue in an amount necessary to offset our expenses. To date, we have not generated any revenue from our drug candidates or technologies, other than limited grant revenues, milestone payments from Takeda Pharmaceutical Company Limited and a technology access fee from Bayer, and we do not expect to generate any revenue from the sale of products in the near future. We do not expect to generate significant revenue unless and until we progress our drug candidates through clinical trials and obtain marketing approval of, and begin to sell one or more of our drug candidates, or otherwise receive substantial licensing or other payments. Our ability to generate revenue depends on a number of factors, including, but not limited to, our ability to:

- successfully complete preclinical studies;
- have Investigational New Drug, or IND, applications approved by the U.S. Food Drug Administration, or FDA, allowing us to commence clinical trials;
- successfully enroll subjects in, and complete, clinical trials;
- receive regulatory approvals from applicable regulatory authorities;
- initiate and successfully complete all safety and other studies required to obtain U.S. and foreign marketing approval for our drug candidates;

- establish commercial manufacturing capabilities or make arrangements with third-party manufacturers for clinical supply and commercial manufacturing;
- obtain and maintain patent and trade secret protection or regulatory exclusivity for our drug candidates;
- launch commercial sales of our drug candidates, if and when approved, whether alone or in collaboration with others;
- obtain and maintain acceptance of the drug candidates, if and when approved, by patients, the medical community, and third-party payors;
- effectively compete with other therapies;
- obtain and maintain healthcare coverage and adequate reimbursement;
- protect and enforce our intellectual property rights and defend against intellectual property claims;
- take temporary precautionary measures to help minimize the impact of the COVID-19 pandemic or other force majeure event on our business; and
- maintain a continued acceptable safety profile of the drug candidates following approval.

If we do not achieve one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize our drug candidates, which would materially harm our business. If we do not receive regulatory approvals for our drug candidates, we may not be able to continue our operations.

We or our current and future collaborators may never successfully develop and commercialize drug products, which would negatively affect our results of operation and our ability to continue our business operations.

We may not succeed in producing drug candidates that can be commercialized. To achieve success with our drug candidates, we or our current or future collaborators must develop, and eventually commercialize, a drug product or drug products that generate significant revenue. We currently generate revenues primarily from our collaboration relationships and expect to continue to derive most of our revenue from these relationships until such time as our or our collaborators' drug development and commercialization efforts are successful, if ever.

Achieving success in drug development will require us or our current or future collaborators to be effective in a range of challenging activities, including completing preclinical testing and clinical trials of drug candidates, obtaining regulatory approval for these drug candidates, and manufacturing, marketing, and selling any products for which we or they may obtain regulatory approval. We and our current drug discovery collaborators are only in the preliminary stages of most of these activities. We and they may never succeed in these activities and, even if we do, we may never generate revenues that are significant enough to achieve profitability, or even if our collaborators do, we may not receive option fees, milestone payments, or royalties from them that are significant enough for us to achieve profitability. Because of the intense competition in the market for our data solutions and the numerous risks and uncertainties associated with biopharmaceutical product development, we are unable to accurately predict when, or if, we will be able to achieve or sustain profitability.

Even if we achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable would eventually depress the value of our company and could impair our ability to raise capital, expand our business, maintain our research and development efforts, develop a pipeline of drug candidates, enter into collaborations, or even continue our operations. A decline in the value of our company could also cause you to lose all or part of your investment.

Our quarterly and annual operating results may fluctuate significantly in the future due to a variety of factors, many of which are outside of our control and may be difficult to predict.

The amount of our future losses is uncertain and our quarterly and annual operating results may fluctuate significantly or may fall below the expectations of investors or securities analysts, each of which may cause our stock price to fluctuate or decline. The reasons our quarterly and annual operating results may fluctuate include the following:

- the cost to continue to maintain, develop, and integrate technological advancements;
- the timing, quality, regulatory compliance, and success or failure of clinical trials for our drug candidates or competing drug candidates, or any other change in the competitive landscape of our industry, including consolidation among our competitors or partners;
- our ability to successfully recruit and retain subjects, sites, and staff for clinical trials, and any delays caused by difficulties in such efforts;
- our ability to obtain marketing approval for our drug candidates, and the timing and scope of any such approvals we may receive;
- the timing and cost of, and level of investment in, research and development activities relating to our drug candidates, which may change from time to time;
- the timing, complexity, and cost of manufacturing our drug candidates, which may vary depending on the quantity of production and the terms of our agreements with manufacturers;
- our ability to attract, hire, and retain qualified personnel, including highly specialized scientists, clinicians, and engineers;
- expenditures that we will or may incur to develop additional drug candidates;
- the level of demand for our drug candidates should they receive approval, which may vary significantly;
- the risk/benefit profile, cost, and reimbursement policies with respect to our drug candidates, if approved, and existing and potential future therapeutics that compete with our drug candidates;
- the changing and volatile U.S. and global economic environments, including as a result of the COVID-19 pandemic and terrorism; and
- future accounting pronouncements or changes in our accounting policies.

The cumulative effects of these and other factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated guidance we may provide.

If we engage in future acquisitions or strategic partnerships, this may increase our capital requirements, dilute our stockholders' equity, cause us to incur debt or assume contingent liabilities, and subject us to other risks.

We may engage in various acquisitions and strategic partnerships in the future, including by licensing or acquiring complementary products, intellectual property rights, technologies, or businesses. Any acquisition or strategic partnership may entail numerous risks, including:

- increased operating expenses and cash requirements;

- the assumption of indebtedness or contingent liabilities;
- the issuance of our equity securities which would result in dilution to our stockholders' equity;
- assimilation of operations, intellectual property, products, and drug candidates of an acquired company, including difficulties associated with integrating new personnel;
- the diversion of our management's attention from our existing product programs and initiatives in pursuing such an acquisition or strategic partnership;
- retention of key employees, the loss of key personnel, and uncertainties in our ability to maintain key business relationships;
- risks and uncertainties associated with the other party to such a transaction, including the prospects of that party and their existing products or drug candidates and regulatory approvals; and
- our inability to generate revenue from acquired intellectual property, technology, and/or products sufficient to meet our objectives or even to offset the associated transaction and maintenance costs.

In addition, if we undertake such a transaction, we may issue dilutive securities, assume, or incur debt obligations, incur large one-time expenses, and acquire intangible assets that could result in significant future amortization expense.

Risks Related to the Discovery and Development of Drug Candidates

Our approach to drug discovery is unique and may not lead to successful drug products.

We image cells and use cell morphology to understand how a diseased cell responds to drugs and when it appears normal. Biology is complex. If studying the shape, structure, form, and size of cells does not prove to be an accurate way to better understand diseases or does not lead to the insights, viable drug candidates, or products we anticipate, our drug discovery platform may not be useful or may not lead to successful drug products or we may have to pivot to a new business model, any of which could have an adverse effect on our reputation and results of operations.

Our drug candidates are in preclinical or clinical development, which are lengthy and expensive processes with uncertain outcomes and the potential for substantial delays. We cannot give any assurance that any of our drug candidates will be successful in clinical trials or receive regulatory approval, which approval is necessary before they can be commercialized.

Our drug candidates are in preclinical or clinical development, which are lengthy and expensive processes with uncertain outcomes and the potential for substantial delays. We have not yet demonstrated our ability to complete clinical development, obtain regulatory approvals, manufacture a commercial scale product, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful commercialization. We currently have four clinical-stage drug candidates focused on rare, monogenic diseases with no known established regulatory precedent. We anticipate filing IND applications with the FDA for Phase 2 studies and beginning such studies for all four drug candidates in . We may not be able to file such INDs or INDs for any other drug candidates on the timelines we expect, if at all, and any such delays could impact any additional product development timelines. For example, we may experience manufacturing delays with preclinical and clinical studies. Moreover, we cannot be sure that submission of an IND will result in the FDA allowing further clinical trials to begin, or that, once begun, issues will not arise that require us to suspend or terminate clinical trials. Commencing each of these clinical trials is subject to finalizing the

trial design based on discussions with the FDA and other regulatory authorities. Any guidance we receive from the FDA or other regulatory authorities is subject to change. These regulatory authorities could change their positions at any time, including their positions on the acceptability of our trial designs or the clinical endpoints or populations selected, which may require us to complete additional clinical trials or impose stricter approval conditions than we currently expect. Successful completion of our clinical trials is a prerequisite to submitting a New Drug Application, or NDA, to the FDA and a Marketing Authorization Application, or MAA, to the European Medicines Agency, or EMA, or Medicines and Healthcare Products Regulatory Agency, or MHRA, for each drug candidate and, consequently, the ultimate approval and commercial marketing of each drug candidate. We do not know whether any of our future clinical trials will begin on time or ever be completed on schedule, if at all.

If we are required to conduct additional clinical trials or other testing of our drug candidates beyond those that we currently contemplate, if we are unable to successfully complete clinical trials of our drug candidates or other testing, if the results of these trials or tests are not positive or are only modestly positive or if there are safety concerns, we may:

- be delayed in obtaining marketing approvals for our drug candidates;
- not obtain marketing approvals at all;
- obtain approvals for indications or patient populations that are not as broad as intended or desired or that impose label restrictions or warnings or risk mitigation requirements;
- be subject to post-marketing testing requirements; or
- have products removed from the market after obtaining marketing approval.

Clinical development is a lengthy and expensive process, with an uncertain outcome.

It is impossible to predict when or if any of our drug candidates will prove effective and safe in humans or will receive regulatory approval. To obtain marketing approval from regulatory authorities for the sale of any drug candidate, we must complete preclinical studies and then conduct extensive clinical trials to demonstrate the safety and efficacy of our drug candidates in humans. We may accelerate from cell models in our drug discovery platform directly to patients without validating results through animal studies, or validate them in animal studies at the same time as we conduct Phase 1 clinical trials. This approach could pose additional risks to our success because the effect of certain of our drug candidates on diseases has not been tested in animals prior to testing in humans. Clinical testing is expensive, difficult to design and implement, can take many years to complete, and is uncertain as to outcome. A failure of one or more clinical trials can occur at any stage of testing. The outcome of preclinical development testing and early clinical trials may not be predictive of the success of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that have believed their drug candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their drug candidates or adequate payor reimbursement for approved products. Our preclinical studies and future clinical trials may not be successful.

From time to time, we may publish interim top-line or preliminary data from our clinical trials. Interim data from clinical trials are subject to the risk that one or more of the clinical outcomes may materially change as enrollment of participants continues and more data become available. Preliminary or top-line data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we previously published. As a result, interim and preliminary data should be viewed with caution until the final data are available. Adverse differences between preliminary or interim data and final data could significantly harm our business prospects.

We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our drug candidates.

We may experience delays in completing our preclinical studies and initiating or completing clinical trials, and we may experience numerous unforeseen events during, or as a result of, any future clinical trials that we could conduct that could delay or prevent our ability to receive marketing approval or commercialize our drug candidates, including:

- regulators or Institutional Review Boards, or IRBs, or ethics committees may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we may experience delays in reaching, or fail to reach, agreement on acceptable terms with prospective trial sites and prospective Contract Research Organizations, or CROs, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- clinical trials of our drug candidates may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional preclinical studies or clinical trials or we may decide to abandon product development programs;
- the number of participants required for clinical trials of our drug candidates may be larger than we anticipate, enrollment in these clinical trials may be slower than we anticipate or participants may drop out of these clinical trials or fail to return for post-treatment follow-up at a higher rate than we anticipate;
- our third-party contractors may fail to comply with regulatory requirements or to meet their contractual obligations to us in a timely manner, or at all, or may deviate from the clinical trial protocol or drop out of the trial, which may require that we add new clinical trial sites or investigators;
- we may elect to, or regulators or IRBs or ethics committees may require us or our investigators to, suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks;
- the cost of clinical trials of our drug candidates may be greater than we anticipate;
- the supply or quality of our drug candidates or other materials necessary to conduct clinical trials of our drug candidates may be insufficient or inadequate;
- delays in the manufacturing of our drug candidates; and
- our drug candidates may have undesirable side effects or other unexpected characteristics, causing us or our investigators, regulators, or IRBs or ethics committees to suspend or terminate the trials, or reports may arise from preclinical or clinical testing of other therapies that raise safety, efficacy, or other concerns about our drug candidates.

We could encounter delays if a clinical trial is suspended or terminated by us, by the IRBs or ethics committees of the institutions at which such trials are being conducted, by the Data Safety Monitoring Board for such a trial, or by the FDA or other regulatory authorities. Regulatory authorities may impose a suspension or termination or clinical hold due to a number of factors, such as failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or other regulatory authorities, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a product, changes in governmental regulations or administrative actions, or lack of adequate funding to continue the clinical trial. Many of the factors that could cause, or lead to, a delay in the commencement or completion of

clinical trials may also ultimately lead to the denial of regulatory approval of our drug candidates. Further, the FDA may disagree with our clinical trial design and our interpretation of data from clinical trials or may change the requirements for approval even after it has reviewed and commented on the design for our clinical trials.

Our product development costs will also increase if we experience delays in testing or regulatory approvals. We do not know whether any of our future clinical trials will begin as planned, or whether any of our current or future clinical trials will need to be restructured or will be completed on schedule, if at all. Significant preclinical study or clinical trial delays, including those caused by the COVID-19 pandemic, also could shorten any periods during which we may have the exclusive right to commercialize our drug candidates or allow our competitors to bring products to market before we do and impair our ability to successfully commercialize our drug candidates and may harm our business and results of operations. Any delays in our preclinical or future clinical development programs may harm our business, financial condition, and prospects significantly.

If we experience delays or difficulties in the enrollment of patients in clinical trials, our receipt of necessary regulatory approvals could be delayed or prevented.

We may not be able to initiate or continue clinical trials for current or future drug candidates if we are unable to locate and enroll a sufficient number of eligible participants in these trials as required by the FDA or similar regulatory authorities outside the United States. Our ability to enroll eligible participants may be limited or may result in slower enrollment than we anticipate. In addition, competitors may initiate or have ongoing clinical trials for drug candidates that treat the same indications as our current or future drug candidates, and participants who would otherwise be eligible for our clinical trials may instead enroll in our competitors' clinical trials. Furthermore, our ability to enroll participants may be delayed by the evolving COVID-19 pandemic and we do not know the extent and scope of such delays at this point.

In addition to the competitive trial environment, the eligibility criteria of our planned clinical trials will further limit the pool of available study participants as we will require that participants have specific characteristics, such as rare diseases connected to our drug candidates, which also may make enrollment challenging. Additionally, the process of finding potential participants may prove costly. We also may not be able to identify, recruit, and enroll a sufficient number of participants to complete our clinical studies because of the perceived risks and benefits of the drug candidates under study, the availability and efficacy of competing therapies and clinical trials, the proximity and availability of clinical trial sites for prospective participants, and the referral practices of physicians. If people are unwilling to participate in our studies for any reason, the timeline for recruiting participants, conducting studies, and obtaining regulatory approval of potential products may be delayed.

Clinical trial enrollment may be affected by other factors including:

- the severity of the disease under investigation;
- the eligibility criteria for the clinical trial in question;
- the availability of an appropriate genomic screening test;
- the perceived risks and benefits of the drug candidate under study;
- the efforts to facilitate timely enrollment in clinical trials;
- the referral practices of physicians;
- the ability to monitor participants adequately during and after the trial;
- the proximity and availability of clinical trial sites for prospective participants;

- factors we may not be able to control, such as current or potential pandemics that may limit the availability of participants, principal investigators, study staff, or clinical sites, such as the outbreak of COVID-19;
- referral practices of physicians;
- ability to monitor participants adequately during and after the trial;
- ability to recruit clinical trial investigators with the appropriate competencies and experience;
- our ability to maintain participant informed consent and privacy; and
- the risk that enrolled participants will not complete a clinical trial.

Our planned clinical trials or those of our potential future collaborators may reveal significant adverse events not seen in our preclinical or nonclinical studies and may result in a safety profile that could inhibit regulatory approval or market acceptance of any of our drug candidates.

Before obtaining regulatory approvals for the commercial sale of any products, we must demonstrate through lengthy, complex, and expensive preclinical studies and clinical trials that our drug candidates are both safe and effective for use in each target indication. Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process. The results of preclinical studies and early clinical trials of our drug candidates may not be predictive of the results of later-stage clinical trials. In addition, initial success in clinical trials may not be indicative of results obtained when such trials are completed. There is typically an extremely high rate of attrition from the failure of drug candidates proceeding through clinical trials. Drug candidates in later stages of clinical trials also may fail to show the desired safety and efficacy profile despite having progressed through nonclinical studies and initial clinical trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or unacceptable safety issues, notwithstanding promising results in earlier trials. Most drug candidates that commence clinical trials are never approved as products and there can be no assurance that any of our current or future clinical trials will ultimately be successful or support further clinical development of any of our drug candidates.

We may develop future drug candidates, in combination with one or more disease therapies. The uncertainty resulting from the use of our drug candidates in combination with other disease therapies may make it difficult to accurately predict side effects in future clinical trials.

As is the case with many treatments for rare diseases and other conditions, there have been, and it is likely that there may be, side effects associated with the use of our drug candidates. If significant adverse events or other side effects are observed in any of our current or future drug candidates, we may have difficulty recruiting participants in our clinical trials, they may drop out of our trials, or we may be required to abandon the trials or our development efforts of one or more drug candidates altogether. We, the FDA or other applicable regulatory authorities, or an IRB may suspend or terminate clinical trials of a drug candidate at any time for various reasons, including a belief that subjects in such trials are being exposed to unacceptable health risks or adverse side effects. Some potential therapeutics developed in the biotechnology industry that initially showed therapeutic promise in early-stage trials have later been found to cause side effects that prevented their further development. Even if the side effects do not preclude the product from obtaining or maintaining marketing approval, undesirable side effects may inhibit market acceptance of the approved product due to its tolerability versus other therapies. Any of these developments could materially harm our business, financial condition, and prospects.

We may in the future conduct clinical trials for our drug candidates outside the United States, and the FDA and similar foreign regulatory authorities may not accept data from such trials.

We may in the future choose to conduct additional clinical trials outside the United States, including in Australia, Europe, Asia, or other foreign jurisdictions. FDA acceptance of trial data from clinical trials conducted outside the United States may be subject to certain conditions. In cases where data from clinical trials conducted outside the United States are intended to serve as the sole basis for marketing approval in the United States, the FDA will generally not approve the application on the basis of foreign data alone unless i) the data are applicable to the United States population and United States medical practice; ii) the trials were performed by clinical investigators of recognized competence and iii) the data may be considered valid without the need for an on-site inspection by the FDA or, if the FDA considers such an inspection to be necessary, the FDA is able to validate the data through an on-site inspection or other appropriate means. Additionally, the FDA's clinical trial requirements, including large enough size of trial populations and statistical powering, must be met. Many foreign regulatory bodies have similar approval requirements. In addition, such foreign trials would be subject to the applicable local laws of the foreign jurisdictions where the trials are conducted. There can be no assurance that the FDA or any similar foreign regulatory authority will accept data from trials conducted outside of the United States or the applicable jurisdiction. If the FDA or any similar foreign regulatory authority does not accept such data, it would result in the need for additional trials, which would be costly and time-consuming and delay aspects of our business plan, and which may result in our drug candidates not receiving approval or clearance for commercialization in the applicable jurisdiction.

Following the United Kingdom's departure from the EU on January 31, 2020, and the end of the a "transition period" on December 31, 2020, the EU and the United Kingdom have entered into a trade and cooperation agreement which governs certain aspects of their future relationship, including by ensuring tariff-free trade for certain goods and services. Since the regulatory framework for pharmaceutical products in the United Kingdom relating to quality, safety and efficacy of pharmaceutical products, clinical trials, marketing authorization, commercial sales and distribution of pharmaceutical products is derived from EU directives and regulations, Brexit will materially impact the future regulatory regime which applies to products and the approval of drug candidates in the United Kingdom. Longer term, the United Kingdom is likely to develop its own legislation that diverges from that in the EU.

The incidence and prevalence for target patient populations of our drug candidates have not been established with precision. If the market opportunities for our drug candidates are smaller than we estimate or if any approval that we obtain is based on a narrower definition of the patient population, our revenue and ability to achieve profitability will be adversely affected, possibly materially.

Even if approved for commercial sale, the total addressable market for our drug candidates will ultimately depend upon, among other things, the diagnosis criteria included in the final label, if our drug candidates are approved for these indications, acceptance by the medical community and patient access, product pricing and reimbursement. The number of patients targeted by our drug candidates may turn out to be lower than expected, patients may not be otherwise amenable to treatment with our products, or new patients may become increasingly difficult to identify or gain access to, all of which would adversely affect our results of operations and our business. We may not be successful in our efforts to identify additional drug candidates. Due to our limited resources and access to capital, we must prioritize development of certain drug candidates, which may prove to be the wrong choice and may adversely affect our business.

Although we intend to explore other therapeutic opportunities, in addition to the drug candidates that we are currently developing, we may fail to identify viable new drug candidates for clinical development for a number of reasons. If we fail to identify additional potential drug candidates, our business could be materially harmed.

Research programs to pursue the development of our existing and planned drug candidates for additional indications and to identify new drug candidates and disease targets require substantial technical, financial, and human resources whether or not they are ultimately successful. For example, pursuant to our Research Collaboration and Option Agreement with Bayer AG, or the Bayer Agreement, we collaborate with Bayer AG, or Bayer, to develop various projects related to fibrosis. There can be no assurance that we will find potential targets using this approach, that any such targets will be tractable, or that such clinical validations will be successful. Our research programs may initially show promise in identifying potential indications and/or drug candidates, yet fail to yield results for clinical development for a number of reasons, including:

- the research methodology used may not be successful in identifying potential indications and/or drug candidates, including as a result of the limited patient sample represented in our databases and the validity of extrapolating based on insights from a particular cellular context that may not apply to other more relevant cellular contexts;
- potential drug candidates may, after further study, be shown to have harmful adverse effects or other characteristics that indicate they are unlikely to be effective products; or
- it may take greater human and financial resources than we will possess to identify additional therapeutic opportunities for our drug candidates or to develop suitable potential drug candidates through internal research programs, thereby limiting our ability to develop, diversify and expand our product portfolio.

Because we have limited financial and human resources, we will have to prioritize and focus on certain research programs, drug candidates and target indications while forgoing others. As a result, we may forgo or delay pursuit of opportunities with other drug candidates or for other indications that later prove to have greater commercial potential or a greater likelihood of success. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities.

Accordingly, there can be no assurance that we will ever be able to identify additional therapeutic opportunities for our drug candidates or to develop suitable potential drug candidates through internal research programs, which could materially adversely affect our future growth and prospects. We may focus our efforts and resources on potential drug candidates or other potential programs that ultimately prove to be unsuccessful.

If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals for our drug candidates, we will not be able to commercialize, or will be delayed in commercializing, our drug candidates, and our ability to generate revenue will be materially impaired.

Our drug candidates and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale, distribution, import and export are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by comparable authorities in other countries. Before we can commercialize any of our drug candidates, we must obtain marketing approval. Currently, all of our drug candidates are in development, and we have not received approval to market any of our drug candidates from regulatory authorities in any jurisdiction. It is possible that our drug candidates, including any drug candidates we may seek to develop in the

future, will never obtain regulatory approval. We have only limited experience in filing and supporting applications to regulatory authorities and expect to rely on CROs and/or regulatory consultants to assist us in this process. Securing regulatory approval requires the submission of extensive preclinical and clinical data and supporting information to the various regulatory authorities for each therapeutic indication to establish the drug candidate's safety and efficacy. Securing regulatory approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the relevant regulatory authority. Our drug candidates may not be effective, may be only moderately effective or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining marketing approval or prevent or limit commercial use. In addition, regulatory authorities may find fault with our manufacturing process or facilities or that of third-party contract manufacturers. We may also face greater than expected difficulty in manufacturing our drug candidates.

The process of obtaining regulatory approvals, both in the United States and abroad, is expensive and often takes many years. If the FDA or a comparable foreign regulatory authority requires that we perform additional preclinical or clinical trials, approval, if obtained at all, may be delayed. The length of such a delay varies substantially based upon a variety of factors, including the type, complexity and novelty of the drug candidates involved. Changes in marketing approval policies during the development period, changes in or the enactment of additional statutes or regulations, or changes in regulatory review for each submitted NDA, 510(k), Premarket Approval Application, or PMA, or equivalent application types, may cause delays in the approval or rejection of an application. The FDA and comparable authorities in other countries have substantial discretion in the approval process and may refuse to accept any application or may decide that our data are insufficient for approval and require additional preclinical, clinical, or other studies. Our drug candidates could be delayed in receiving, or fail to receive, regulatory approval for many reasons, including the following:

- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our clinical trials;
- we may not be able to enroll a sufficient number of patients in our clinical studies;
- we may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that a drug candidate is safe and effective for its proposed indication or a related companion diagnostic is suitable to identify appropriate patient populations;
- the results of clinical trials may not meet the level of statistical significance required by the FDA or comparable foreign regulatory authorities for approval;
- we may be unable to demonstrate that a drug candidate's clinical and other benefits outweigh its safety risks;
- the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our drug candidates may not be sufficient or of sufficient quality to support the submission of an NDA or other submission or to obtain regulatory approval in the United States or elsewhere;
- the FDA or comparable foreign regulatory authorities may find deficiencies with or fail to approve the manufacturing processes or facilities of third-party manufacturers with which we contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change such that our clinical or manufacturing data are insufficient for approval.

Even if we were to obtain approval, regulatory authorities may approve any of our drug candidates for fewer or more limited indications than we request, thereby narrowing the commercial

potential of the drug candidate. In addition, regulatory authorities may grant approval contingent on the performance of costly post-marketing clinical trials or may approve a drug candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that drug candidate. Any of the foregoing scenarios could materially harm the commercial prospects for our drug candidates.

If we experience delays in obtaining approval or if we fail to obtain approval of our drug candidates, the commercial prospects for our drug candidates may be harmed and our ability to generate revenues will be materially impaired.

We may never realize return on our investment of resources and cash in our drug discovery collaborations.

We conduct drug discovery activities for or with collaborators who are engaged in drug discovery and development. These collaborators include pre-commercial biotechnology companies and large pharmaceutical companies. When we engage in drug discovery with these collaborators, we typically provide the benefit of our platform and platform experts who identify molecules that have activity against one or more specified targets. In consideration, we have received equity investments, upfront fees, and/or the right to receive option fees, cash milestone payments upon the achievement of specified development, regulatory, commercial sales milestones for the drug discovery targets, and potential royalties.

We may never realize a longer-term return on our investment of resources and cash in our drug discovery collaborations. Clinical drug development involves a lengthy and expensive process, with an uncertain outcome. Our drug discovery collaborators may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of any drug candidates. In addition, our ability to realize returns from our drug discovery collaborations is subject to the following risks:

- drug discovery collaborators have significant discretion in determining the amount and timing of efforts and resources that they will apply to our collaborations and may not perform their obligations as expected;
- drug discovery collaborators may not pursue development or commercialization of any drug candidates for which we are entitled to option fees, milestone payments, or royalties or may elect not to continue or renew development or commercialization programs based on results of clinical trials or other studies, changes in the collaborator's strategic focus or available funding, or external factors, such as an acquisition, that divert resources or create competing priorities;
- drug discovery collaborators may delay clinical trials for which we are entitled to milestone payments;
- we may not have access to, or may be restricted from disclosing, certain information regarding our collaborators' drug candidates being developed or commercialized and, consequently, may have limited ability to inform our stockholders about the status of, and likelihood of achieving, milestone payments or royalties under such collaborations;
- drug discovery collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with any drug candidates and products for which we are entitled to milestone payments or royalties and the collaborator may believe that the competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive;
- drug candidates discovered in drug discovery collaborations with us may be viewed by our collaborators as competitive with their own drug candidates or products, which may cause our

collaborators to cease to devote resources to the commercialization of any such drug candidates;

- existing drug discovery collaborators and potential future drug discovery collaborators may begin to perceive us to be a competitor more generally, particularly as we advance our internal drug discovery programs, and therefore may be unwilling to continue existing collaborations with us or to enter into new collaborations with us;
- a drug discovery collaborator may fail to comply with applicable regulatory requirements regarding the development, manufacture, distribution, or marketing of a drug candidate or product, which may impact our ability to receive milestone payments;
- disagreements with drug discovery collaborators, including disagreements over intellectual property or proprietary rights, contract interpretation, or the preferred course of development, might cause delays or terminations of the research, development, or commercialization of drug candidates for which we are eligible to receive milestone payments, or might result in litigation or arbitration;
- drug discovery collaborators may not properly obtain, maintain, enforce, defend or protect our intellectual property or proprietary rights or may use our proprietary information in such a way as to potentially lead to disputes or legal proceedings that could jeopardize or invalidate our or their intellectual property or proprietary rights or expose us and them to potential litigation;
- drug discovery collaborators may infringe, misappropriate, or otherwise violate the intellectual property or proprietary rights of third parties, which may expose us to litigation and potential liability; and
- drug discovery collaborations may be terminated prior to our receipt of any significant value from the collaboration.

Our drug discovery collaborations may not lead to development or commercialization of drug candidates that results in our receipt of option fees, milestone payments, or royalties or other payments in a timely manner, or at all. For example, we may be over-reliant on our partners to provide information for molecules that we in-license. The molecules that we in-license may not be well protected because the composition of matter patents that once protected them have expired. Moreover, we may have difficulty obtaining the quality and quantity of active pharmaceutical ingredient, or API, or be able to ensure the stability of the molecule, all of which is needed to conduct clinical trials or bring a drug candidate to market. For those molecules that we are attempting to repurpose for other indications, our partners may have not have sufficient data, poor quality data or be able to help us interpret data, any of which could cause our collaboration to fail.

If any drug discovery collaborations that we enter into do not result in the successful development and commercialization of drug products that result in option fees, milestone payments, or royalties or other payments to us, we may not receive return on the resources we have invested in such drug discovery collaborations. Moreover, even if a drug discovery collaboration initially leads to the achievement of milestones that result in payments to us, it may not continue to do so.

We face substantial competition, which may result in others discovering, developing, or commercializing products before or more successfully than we do.

The development and commercialization of new products in the biopharmaceutical and related industries is highly competitive. There are other companies focusing on technology-enabled drug discovery to identify and develop NCEs and KCEs. Some of these competitive companies are based on scientific approaches that are the same as or similar to our approach, and others are based on entirely different approaches. These companies include divisions of large pharmaceutical companies

and biotechnology companies of various sizes. We face competition with respect to our current drug candidates and will face competition with respect to any drug candidates that we may seek to develop or commercialize in the future, from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. Potential competitors also include academic institutions, government agencies, and other public and private research organizations that conduct research, seek patent protection, and establish collaborative arrangements for research, development, manufacturing, and commercialization.

Any drug candidates that we successfully develop and commercialize will compete with currently approved therapies and new therapies that may become available in the future from segments of the pharmaceutical, biotechnology and other related industries that pursue new therapeutics. Key product features that would affect our ability to effectively compete with other therapeutics include the efficacy, safety, and convenience of our products. We believe principal competitive factors to our business include, among other things, the accuracy of our computations and predictions, ability to integrate experimental and computational capabilities, ability to successfully transition research programs into clinical development, ability to raise capital, and the scalability of the platform, pipeline, and business.

Many of the companies that we compete against or against which we may compete in the future have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical, biotechnology and diagnostic industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs. In addition, we cannot predict whether our current competitive advantages and our software tools, will remain in place and evolve appropriately as barriers to entry in the future. If not, other companies may be able to more directly or effectively compete with us.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we or our collaborators may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we or our collaborators are able to enter the market. The key competitive factors affecting the success of all of our drug candidates, if approved, are likely to be their efficacy, safety, convenience, price, the level of generic competition and the availability of reimbursement from government and other third-party payors.

Because we have multiple programs and drug candidates in our development pipeline and are pursuing a variety of target indications and treatment modalities, we may expend our limited resources to pursue a particular drug candidate and fail to capitalize on development opportunities or drug candidates that may be more profitable or for which there is a greater likelihood of success.

We currently focus on the development of drug candidates regardless of the treatment modality or the particular target indication. Because we have limited financial and personnel resources, we may forgo or delay pursuit of opportunities with potential target indications or drug candidates that later prove to have greater commercial potential than our current and planned development programs and drug candidates. Our resource allocation decisions may cause us to fail to capitalize on viable

commercial products or profitable market opportunities. Our spending on current and future research and development programs and other future drug candidates for specific indications may not yield any commercially viable future drug candidates.

We and our collaborators may not achieve projected discovery and development milestones and other anticipated key events in the time frames that we or they announce, which could have an adverse impact on our business and could cause our stock price to decline.

From time to time, we expect that we will make public statements regarding the expected timing of certain milestones and key events, such as the commencement and completion of preclinical and clinical studies in our internal drug discovery programs as well developments and milestones under our collaborations. Our collaborators, such as Bayer, have also made public statements regarding expectations for the development of programs under collaboration with us and may in the future make additional statements about their goals and expectations for collaborations with us. The actual timing of these events can vary dramatically due to a number of factors such as delays or failures in our or our current and future collaborators' drug discovery and development programs, the amount of time, effort, and resources committed by us and our current and future collaborators, and the numerous uncertainties inherent in the development of drugs. As a result, there can be no assurance that our or our current and future collaborators' programs will advance or be completed in the time frames we or they announce or expect. If we or any collaborators fail to achieve one or more of these milestones or other key events as planned, our business could be materially adversely affected, and the price of our common stock could decline.

Risks Related to our Platform and Data

Our business and operations would suffer in the event of computer system failures, cyber-attacks, or deficiencies in our or third parties' cybersecurity.

We are increasingly dependent upon information technology systems, infrastructure, and data to operate our business. In the ordinary course of business, we collect, store, and transmit confidential information (including but not limited to intellectual property, proprietary business information, personal information, and other confidential information). It is critical that we do so in a secure manner to maintain the confidentiality and integrity of this information. We also have outsourced elements of our operations to third parties, and as a result we manage a number of third-party vendors and other contractors and consultants who have access to our confidential information.

Given our limited operating history, we are still in the process of implementing our internal security and business continuity measures and developing our information technology infrastructure. Our internal computer systems and those of current and future third parties on which we rely may fail and are vulnerable to damage from computer viruses and unauthorized access. Our information technology and other internal infrastructure systems, including corporate firewalls, servers, data center facilities that we colocate in, lab equipment, leased lines, and connection to the Internet, face the risk of breakdown or other damage or interruption from service interruptions, system malfunction, natural disasters, terrorism, war and telecommunication and electrical failures, as well as security breaches from inadvertent or intentional actions by our employees, contractors, consultants, business partners, and/or other third parties, or from cyber-attacks by malicious third parties (including the deployment of harmful malware, ransomware, denial-of-service attacks, social engineering and other means to affect service reliability and threaten the confidentiality, integrity and availability of information), each of which could compromise our system infrastructure or lead to the loss, destruction, alteration, disclosure, or dissemination of, or damage or unauthorized access to, our data or data that is processed or maintained on our behalf, or other assets.

If such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations, and could result in financial, legal, business, and reputational harm to us. For example, one of our primary differentiators is our proprietary technical information and biological and chemical data. The loss, corruption, unavailability of, or damage to our data would interfere with and undermine the insights we draw from our platform, which could result in the waste of resources on insights based on flawed premises. In addition, the loss or corruption of, or other damage to, clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. Likewise, we rely on third parties for the manufacture of our drug candidates or any future drug candidates and to conduct clinical trials, and similar events relating to their systems and operations could also have a material adverse effect on our business and lead to regulatory agency actions. The risk of a security breach or disruption, particularly through cyber-attacks or cyber intrusion, including by computer hackers, foreign governments, and cyber terrorists, has generally increased as the number, intensity, and sophistication of attempted attacks and intrusions from around the world have increased. Sophisticated cyber attackers (including foreign adversaries engaged in industrial espionage) are skilled at adapting to existing security technology and developing new methods of gaining access to organizations' sensitive business data, which could result in the loss of proprietary information, including trade secrets. We may not be able to anticipate all types of security threats, and we may not be able to implement preventive measures effective against all such security threats. For example, third parties have in the past and may in the future illegally pirate our software and make that software publicly available on peer-to-peer file sharing networks or otherwise. The techniques used by cyber criminals change frequently, may not be recognized until launched, and can originate from a wide variety of sources, including outside groups such as external service providers, organized crime affiliates, terrorist organizations, or hostile foreign governments or agencies. In addition, in response to the ongoing COVID-19 pandemic, a majority of our workforce is currently working remotely. This could increase our cybersecurity risk, create data accessibility concerns, and make us more susceptible to communication disruptions.

Any security breach or other event that leads to loss, damage, or unauthorized access to, or use, alteration, or disclosure or dissemination of, personal information, including personal information regarding clinical trial subjects, contractors, directors, or employees, our intellectual property, proprietary business information, or other confidential or proprietary information, could harm our reputation directly, enable competitors to compete with us more effectively, compel us to comply with federal and/or state breach notification laws and foreign law equivalents, subject us to mandatory corrective action and otherwise subject us to liability under laws and regulations that protect the privacy and security of personal information, which could result in significant legal and financial exposure and reputational damage that could potentially have an adverse effect on our business. Notifications and follow-up actions related to a security incident could impact our reputation, and we could incur substantial costs, including legal and remediation costs, in connection with these measures and otherwise in connection with any actual or suspected security breach. We expect to incur significant costs in an effort to detect and prevent security incidents and otherwise implement our internal security and business continuity measures, and actual, potential, or anticipated attacks may cause us to incur increasing costs, including costs to deploy additional personnel and protection technologies, train employees, and engage third-party experts and consultants. We may face increased costs and find it necessary or appropriate to expend substantial resources in the event of an actual or perceived security breach.

The costs related to significant security breaches or disruptions could be material and our insurance policies may not be adequate to compensate us for the potential losses arising from any such disruption in, or failure or security breach of, our systems or third-party systems where information important to our business operations or commercial development is stored or processed. In addition, such insurance may not be available to us in the future on economically reasonable terms, or

at all. Further, our insurance may not cover all claims made against us and could have high deductibles in any event, and defending a suit, regardless of its merit, could be costly and divert management attention. Furthermore, if the information technology systems of our third-party vendors and other contractors and consultants become subject to disruptions or security breaches, we may have insufficient recourse against such third parties and we may have to expend significant resources to mitigate the impact of such an event, and to develop and implement protections to prevent future events of this nature from occurring.

If we are not able to develop new solutions and enhancements to our platform that keep pace with technological developments, our business and results of operations would be harmed.

Our ability to increase revenue depends in large part on our ability to enhance and improve our platform. The success of any enhancement to our platform depends on several factors, including the generation of additional biological and chemical data, innovation in hardware solutions, increased computational storage and processing capacity and development of more advanced algorithms. Any new enhancement that we develop may not be introduced in a timely or cost-effective manner, may contain errors, vulnerabilities or bugs, or may not achieve the functionality necessary to generate significant revenue. If we are unable to successfully develop new innovations, enhance our existing platform, or otherwise gain market acceptance, our reputation, business, results of operations, and financial condition would be harmed. Our success also depends on our ability to identify important and emerging use cases and quickly develop new and effective innovations to address those use cases.

We have invested and expect to continue to invest in research and development efforts that further enhance our platform. Such investments may affect our operating results, and, if the return on these investments is lower or develops more slowly than we expect, our revenue and operating results may suffer.

We have invested and expect to continue to invest in research and development efforts that further enhance our platform. These investments may involve significant time, risks, and uncertainties, including the risk that the expenses associated with these investments may affect our margins and operating results and that such investments may not generate sufficient revenues to offset liabilities assumed and expenses associated with these new investments. The software industry changes rapidly as a result of technological and product developments, which may render our solutions less effective. We believe that we must continue to invest a significant amount of time and resources in our platform to maintain and improve our competitive position. If we do not achieve the benefits anticipated from these investments, if the achievement of these benefits is delayed, our business, operating results and prospects may be materially adversely affected.

Defects or disruptions in our platform could result in diminishing our value and prospects.

Our platform depends upon the continuous, effective, and reliable operation of our software, hardware, databases, and related tools and functions and the integrity of our data. Our proprietary software tools, hardware, and data sets are inherently complex and may contain defects or errors. Errors may result from the interface of our proprietary software and hardware tools with our data or third-party systems and data, which we did not develop. The risk of errors is particularly significant when new software or hardware is first introduced or when new versions or enhancements of existing software or hardware are implemented. We have from time to time found defects in our software and hardware, and new errors in our existing software and hardware may be detected in the future. Any errors, defects, disruptions, or other performance problems with our software, hardware, or data sets could hurt our ability to gather valuable insights that drive our drug discoveries. Furthermore, our platform may produce an incomplete data set lacking in coverage which could result in a material adverse effect on our ability to discover new drug candidates. Such discovery is dependent on the

integrity and completeness of our data. The occurrence of any of these events could result in diminishing value of our platform and data and have a material adverse effect on our business, operating results and prospects.

We rely upon third-party providers of cloud-based infrastructure to host our platforms. 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 technological infrastructure relating to our hosted platform to third-party hosting services, such as Google Cloud and Amazon Web Services, or AWS. We have no control over any of these third parties, and while we attempt to reduce risk by minimizing reliance on any single third party or its operations, we cannot guarantee that such third-party providers will not experience system interruptions, outages or delays, or deterioration in their performance. We need to be able to access our computational platform at any time, without interruption or degradation of performance. Our hosted platform depends on protecting the virtual cloud infrastructure hosted by third-party hosting services by maintaining its configuration, architecture, features, and interconnection specifications, as well as protecting the information stored in these virtual data centers, which is transmitted by third-party Internet service providers. We have experienced, and expect that in the future we may again experience interruptions, delays and outages in service and availability from time to time due to a variety of factors, including infrastructure changes, human or software errors, website hosting disruptions and capacity constraints. Any limitation on the capacity of our third-party hosting services 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 disruptive events beyond our control could negatively affect our cloud-based solutions. A prolonged service disruption affecting our cloud-based solutions could damage our reputation 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 the 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 our security measures are breached or unauthorized access to our other data is otherwise obtained, our data may be perceived as not being secure and we may incur significant liabilities.

We use a set of proprietary tools to generate, analyze, and derive novel insights from our data. As a result, unauthorized access to or security breaches of our data, as a result of third-party action, employee or contractor error, malfeasance, or otherwise could result in the loss or corruption of, or other damage to information, claims and litigation, indemnity obligations, damage to our reputation, and other liability. Our collaborators and other third parties we work with may also suffer similar security breaches of data that we rely on. Because the techniques used to obtain unauthorized access or sabotage systems change frequently and generally are not identified until they are launched against a target, we and those we collaborate with may be unable to anticipate these techniques or implement adequate preventative measures. In addition, if our employees or contractors fail to adhere to practices

we have established to maintain a firewall between our internal drug discovery team and our teams that work with external individuals, including our collaborators, or if the technical solutions we have adopted to maintain the firewall malfunction, our collaborators may lose confidence in our ability to maintain the confidentiality of their intellectual property, we may have trouble attracting new collaborators, we may be subject to breach of contract claims by our collaborators, and we may suffer reputational and other harm as a result. Any or all of these issues could result in reputational damage or subject us to third-party lawsuits or other action or liability, which could adversely affect our operating results. 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. For more information see "Risk Factors—Our business and operations would suffer in the event of computer system failures, cyber-attacks or deficiencies in our or third parties' cyber security."

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

Our solutions include software licensed by third parties under any one or more open source licenses, including the Apache 2.0 License, MIT, BSD variants, and others, and we expect to continue to incorporate open source software in our solutions in the future. Moreover, we cannot ensure that we have effectively monitored our use of open source software, or validated the quality or source of such software, or that we are in compliance with the terms of the applicable open source licenses or our current policies and procedures. There have been claims against companies that use open source software in their products and services asserting that the use of such open source software infringes the claimants' intellectual property rights. As a result, we could be subject to suits by third parties claiming that what we believe to be licensed open source software infringes such third parties' intellectual property rights. Additionally, if an author or other third party that distributes such 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 and required to comply with onerous conditions or restrictions on these solutions, which could disrupt the distribution and sale of these solutions. Litigation could be costly for us to defend, 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. Furthermore, these third-party open source providers could experience service outages, data loss, privacy breaches, cyber-attacks, and other events relating to the applications and services they provide that could diminish the utility of these services and which could harm our business as a result.

Use of open source software may entail 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 where open source software may be more susceptible. In addition, certain open source licenses require that source code for software programs that interact with such open source software be made available to the public at no cost and that any modifications or derivative works to such open source software continue to be licensed under the same terms as the open source software license. The terms of various open source licenses to which we are subject have not been interpreted by courts in the relevant jurisdictions, and there is a risk that such licenses could be construed in a manner that imposes unanticipated conditions or restrictions on our ability to market or provide our software and data. By the terms of certain open source licenses, we could be required to release the source code of our proprietary software, and to make our proprietary software available under open source licenses, if we combine our proprietary software with open source software in a certain manner. In the event that portions of our proprietary software are determined to be subject to an open source license, we could

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. Furthermore, any such re-engineering or other remedial efforts could require significant additional research and development resources, and we may not be able to successfully complete any such re-engineering or other remedial efforts. 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.

Risks Related to Our Operations/Commercialization

Our insurance policies are expensive and protect us only from some business risks, which leaves us exposed to significant uninsured liabilities.

We do not carry insurance for all categories of risk that our business may encounter and insurance coverage is becoming increasingly expensive. For example, we can only obtain insurance for the loss of our data that would partially compensate us for its loss. We do not know if we will be able to maintain existing insurance with adequate levels of coverage in the future, and any liability insurance coverage we acquire in the future may not be sufficient to reimburse us for any expenses or losses we may suffer. If we obtain marketing approval for any drug candidates that we or our collaborators may develop, we intend to acquire insurance coverage to include the sale of commercial products, but we may be unable to obtain such insurance on commercially reasonable terms or in adequate amounts. The coverage or coverage limits currently maintained under our insurance policies may not be adequate. If our losses exceed our insurance coverage, our financial condition would be adversely affected. Clinical trials or regulatory approvals for any of our drug candidates could be suspended, which could adversely affect our results of operations and business, including by preventing or limiting the development and commercialization of any drug candidates that we or our collaborators may identify. Additionally, operating as a public company will make it more expensive for us to obtain directors and officers liability insurance. If we do not have adequate levels of directors and officers liability insurance, it may be more difficult for us to attract and retain qualified individuals to serve on our board of directors.

A pandemic, epidemic, or outbreak of an infectious disease, such as COVID-19, may materially and adversely affect our business and our financial results and could cause a disruption to the development of our drug candidates.

Public health crises such as pandemics or similar outbreaks could adversely impact our business. In early 2020, a novel strain of a virus named SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), or coronavirus, which causes COVID-19 has spread to most countries across the world and all 50 states within the U.S. including Utah and specifically Salt Lake City, where our primary office and laboratory space is located. The coronavirus pandemic is evolving, and to date has led to the implementation of various responses, including government-imposed quarantines, travel restrictions and other public health safety measures. The extent to which the coronavirus impacts our operations or those of our third-party partners, including our preclinical studies or clinical trial operations, will depend on future developments, which are highly uncertain and cannot be predicted with confidence, including the duration of the outbreak, new information that will emerge concerning the severity of coronavirus infection and the actions to contain the coronavirus or treat its impact, among others. The continued spread of COVID-19 globally, or the evolution of a new variant of COVID-19 that is more contagious, has more severe effects or is resistant to treatments or vaccinations, could adversely impact our preclinical or clinical trial operations in the U.S., including our ability to recruit and retain trial participants as well as principal investigators and site staff who, as healthcare providers, may have

heightened exposure to COVID-19 if an outbreak occurs in their geography. For example, similar to other biopharmaceutical companies, we may experience delays in initiating preclinical and clinical studies, protocol deviations, enrolling our clinical trials, or dosing of patients in our clinical trials as well as in activating new trial sites. COVID-19 or any variants may also affect employees of third-party CROs located in affected geographies that we rely upon to carry out our clinical trials. In addition, as a result of medical complications associated with the diseases of the patients we seek to enroll and treat in our trials, the patient populations that our lead and other drug candidates target may be particularly susceptible to COVID-19 or any variants, which may make it more difficult for us to identify individuals able to enroll in our current and future clinical trials and may impact the ability of those enrolled to complete any such trials. Any negative impact COVID-19 or any variants has on enrollment or the execution of our drug trials could cause costly delays, which could adversely affect our ability to obtain regulatory approval for and to commercialize our drug candidates, increase our operating expenses, and have a material adverse effect on our financial results.

Additionally, timely enrollment in planned clinical trials is dependent upon clinical trial sites which could be adversely affected by global health issues, such as pandemics. We plan to conduct clinical trials for our drug candidates in geographies which are currently being affected by the coronavirus. Some factors from the coronavirus outbreak that will delay or otherwise adversely affect enrollment in the clinical trials of our drug candidates, as well as our business generally, include:

- the potential diversion of healthcare resources away from the conduct of clinical trials to focus on pandemic concerns, including the attention of physicians serving as our clinical trial investigators, hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our prospective clinical trials;
- limitations on travel that could interrupt key trial and business activities, such as clinical trial site initiations and monitoring, domestic and international travel by employees, contractors or patients to clinical trial sites, including any government-imposed travel restrictions or quarantines that will impact the ability or willingness of patients, employees or contractors to travel to our clinical trial sites or secure visas or entry permissions, a loss of face-to-face meetings and other interactions with potential partners, any of which could delay or adversely impact the conduct or progress of our prospective clinical trials;
- the potential negative effect on the operations of our third-party manufacturers;
- interruptions in global shipping affecting the transport of clinical trial materials, such as tissue samples, investigational drug product and comparator drugs and other supplies used in our studies; and
- business disruptions caused by potential workplace, laboratory and office closures and an increased reliance on employees working from home, disruptions to or delays in ongoing laboratory experiments and operations, staffing shortages, travel limitations or mass transit disruptions, any of which could adversely impact our business operations or delay necessary interactions with local regulators, ethics committees and other important agencies and contractors.

We have taken temporary precautionary measures intended to help minimize the risk of the coronavirus to our employees, including temporarily permitting certain employees to work remotely, suspending all non-essential travel worldwide for our employees and discouraging employee attendance at industry events and in-person work-related meetings, which could negatively affect our business. We cannot presently predict the scope and severity of the planned and potential shutdowns or disruptions of businesses and government agencies, such as the Securities and Exchange Commission, or the SEC, or FDA.

These and other factors arising from the coronavirus could worsen in countries that are already afflicted with the coronavirus or could continue to spread to additional countries. Any of these factors, and other factors related to any such disruptions that are unforeseen, could have a material adverse effect on our business and our results of operation and financial condition. Further, uncertainty around these and related issues could lead to adverse effects on the economy of the United States and other economies, which could impact our ability to raise the necessary capital needed to develop and commercialize our drug candidates.

If we fail to sufficiently manage and improve our technical hardware infrastructure we may experience errors, delays and other performance problems.

We have experienced significant growth in the complexity of our data and the software tools that our hardware infrastructure supports. In addition, we need to properly manage and improve our technological hardware infrastructure in order to support changes in hardware and software parameters and the evolution of our tools. We have experienced, and may in the future experience, disruptions, outages, failures and other performance problems with our software tools or hardware infrastructure. These types of problems may be caused by a variety of factors, including infrastructure changes, human, mechanical, or software errors, viruses, security attacks, and fraud. In some instances, we may not be able to identify the cause or causes of these problems within an acceptable period of time or at all. If we do not accurately predict and identify our infrastructure requirements and failures, including acquisition of newer infrastructure, our team may experience performance problems that may cause delays in our research and development programs, which could adversely affect our business, financial condition, results of operations, and prospects.

Even if any drug candidates we develop receive marketing approval, they may fail to achieve the degree of market acceptance by physicians, patients, healthcare payors, and others in the medical community necessary for commercial success.

The commercial success of our drug candidates will depend upon their degree of market acceptance by physicians, patients, third-party payors, and others in the medical community. Even if any drug candidates we may develop receive marketing approval, they may nonetheless fail to gain sufficient market acceptance by physicians, patients, healthcare payors, and others in the medical community. The degree of market acceptance of any drug candidates we may develop, if approved for commercial sale, will depend on a number of factors, including:

- the efficacy and safety of such drug candidates as demonstrated in pivotal clinical trials and published in peer-reviewed journals;
- the potential and perceived advantages compared to alternative treatments, including any similar generic treatments;
- the ability to offer these products for sale at competitive prices;
- the ability to offer appropriate patient access programs, such as co-pay assistance;
- convenience and ease of dosing and administration compared to alternative treatments;
- the clinical indications for which the drug candidate is approved by FDA or comparable regulatory agencies;
- product labeling or product insert requirements of the FDA or other comparable foreign regulatory authorities, including any limitations, contraindications or warnings contained in a product's approved labeling;
- restrictions on how the product is distributed;
- the timing of market introduction of competitive products;

- publicity concerning these products or competing products and treatments;
- the strength of marketing and distribution support;
- favorable third-party coverage and sufficient reimbursement; and
- the prevalence and severity of any side effects or adverse events.

Sales of medical products also depend on the willingness of physicians to prescribe the treatment, which is likely to be based on a determination by these physicians that the products are safe, therapeutically effective and cost effective. In addition, the inclusion or exclusion of products from treatment guidelines established by various physician groups and the viewpoints of influential physicians can affect the willingness of other physicians to prescribe the treatment. We cannot predict whether physicians, physicians' organizations, hospitals, other healthcare providers, government agencies or private insurers will determine that any product we may develop is safe, therapeutically effective and cost effective as compared with competing treatments. If any drug candidates we develop do not achieve an adequate level of acceptance, we may not generate significant product revenue, and we may not become profitable.

If, in the future, we are unable to establish sales and marketing capabilities or enter into agreements with third parties to sell and market any drug candidates we may develop, we may not be successful in commercializing those drug candidates if and when they are approved.

We do not have a sales or marketing infrastructure and have little experience in the sale, marketing, or distribution of pharmaceutical products. To achieve commercial success for any approved product for which we retain sales and marketing responsibilities, we must either develop a sales and marketing organization, sales and marketing software solutions, or outsource these functions to third parties. In the future, we may choose to build a focused sales, marketing, and commercial support infrastructure to market and sell our drug candidates, if and when they are approved. We may also elect to enter into collaborations or strategic partnerships with third parties to engage in commercialization activities with respect to selected drug candidates, indications or geographic territories, including territories outside the United States, although there is no guarantee we will be able to enter into these arrangements even if the intent is to do so.

There are risks involved with both establishing our own commercial capabilities and entering into arrangements with third parties to perform these services. For example, recruiting and training a sales force or reimbursement specialists is expensive and time consuming and could delay any product launch. If the commercial launch of a drug candidate for which we recruit a sales force and establish marketing and other commercialization capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition commercialization personnel.

Factors that may inhibit our efforts to commercialize any approved product on our own include:

- the inability to recruit and retain adequate numbers of effective sales, marketing, reimbursement, customer service, medical affairs, and other support personnel;
- the inability of sales personnel or software tools to obtain access to physicians or persuade adequate numbers of physicians to prescribe any future approved products;
- the inability of reimbursement professionals to negotiate arrangements for formulary access, reimbursement, and other acceptance by payors;
- the inability to price products at a sufficient price point to ensure an adequate and attractive level of profitability;

- restricted or closed distribution channels that make it difficult to distribute our products to segments of the patient population;
- the lack of complementary products to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines; and
- unforeseen costs and expenses associated with creating an independent commercialization organization.

If we enter into arrangements with third parties to perform sales, marketing, commercial support, and distribution services, our product revenue or the profitability of product revenue may be lower than if we were to market and sell any products we may develop internally. In addition, we may not be successful in entering into arrangements with third parties to commercialize our drug candidates or may be unable to do so on terms that are favorable to us or them. We may have little control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our products effectively or may expose us to legal and regulatory risk by not adhering to regulatory requirements and restrictions governing the sale and promotion of prescription drug products, including those restricting off-label promotion. If we do not establish commercialization capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing our drug candidates, if approved.

As our drug development pipeline increases and matures, the increased demand for clinical and commercial supplies from our facilities and third parties may impact our ability to operate. We will require increased capacity across our entire supply chain. Furthermore, we rely on many service providers, including those that provide manufacturing or testing services, all of whom have inherent risks in their operations that may adversely impact our operations.

We currently utilize, and expect to continue to utilize, third parties to, among other things, manufacture raw materials, components, parts, and consumables, and to perform quality testing, including such materials for our automated robotics platform. If the field of technology-enabled drug discovery continues to expand, we may encounter increasing competition for these materials and services. Demand for third-party manufacturing or testing facilities may grow at a faster rate than their existing capacity, which could disrupt our ability to find and retain third-party suppliers and manufacturers capable of producing sufficient quantities of such raw materials, components, parts, and consumables required for our drug candidates and to maintain our automated robotics platform. The use of service providers and suppliers could expose us to risks, including, but not limited to:

- termination or non-renewal of supply and service agreements with third parties in a manner or at a time that is costly or damaging to us;
- disruptions to the operations of these suppliers and service providers caused by conditions unrelated to our business or operations, including the bankruptcy of the supplier or service provider or force majeure events, such as the COVID-19 pandemic; and
- inspections of third-party facilities by regulatory authorities that could have a negative outcome and result in delays to or termination of their ability to supply our requirements.

Additional risks to our automated robotics platform include reliance on third-party equipment and instrument suppliers and consumable and reagent suppliers. The failure of third-party suppliers to fulfill our needs could adversely affect our ability to continue to operate our drug discovery platform and generate new insights that lead to successful drug candidates.

We are subject to regulatory and operational risks associated with the physical and digital infrastructure at both our internal facilities and those of our external service providers.

Our facilities in Salt Lake City, Utah have not been reviewed or pre-approved by any regulatory agency, nor has the facility been inspected by any Federal regulatory agency such as the FDA. An inspection by the FDA could disrupt our ability to generate data and develop drug candidates. Our laboratory facilities are designed to incorporate a significant level of automation of equipment with integration of several digital systems to improve efficiency of research operations. We have attempted to achieve a high level of digitization for a research operation relative to industry standards. While this is meant to improve operational efficiency, this may pose additional risk of equipment malfunction and even overall system failure or shutdown due to internal or external factors including, but not limited to, design issues, system compatibility, or potential cybersecurity breaches. This may lead to delay in potential drug candidate identification or shutdown of our facility. Any disruption in our data generation capabilities could cause delays in advancing new drug candidates into our pipeline, advancing existing programs, or enhancing the capabilities of our platform, including expanding our data, the occurrence of which could have a material adverse effect on our business, financial condition, results of operations, and prospects.

In the future, we may manufacture drug substances or products for preclinical and clinical use at our facilities and we have limited prior manufacturing experience.

If, in the future, we decide to produce drug substances or products, we will have no prior experience producing it at our facilities for preclinical and clinical use. We could incur delays in implementing the full operational state of the facility, causing delays to preclinical or clinical supply or need to rely on third-party service providers, resulting in unplanned expenses.

As we expand our development and commercial capacity, we may establish manufacturing capabilities inside the Salt Lake City footprint or expand to other locations or geographies, which may lead to regulatory delays or prove costly. If we fail to select the correct location, complete the construction in an efficient manner, recruit the appropriate personnel, and generally manage our growth effectively, the development and production of our investigational medicines could be delayed or curtailed. Additional investments may be needed if changes in our manufacturing process lead to required changes in the facility's infrastructure.

Our current operations are located in Utah and California; and we or the third parties upon whom we depend may be adversely affected by natural disasters and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Our current operations are located in Salt Lake City, Utah and Milpitas, California. Any unplanned event, such as flood, fire, explosion, earthquake, extreme weather condition, medical epidemics, including any potential effects from the current global spread of COVID-19, power shortage, telecommunication failure or other natural or man-made accidents or incidents that result in us being unable to fully utilize our facilities, or the manufacturing facilities of our third-party contract manufacturers, may have a material and adverse effect on our ability to operate our business and have significant negative consequences on our financial and operating conditions. Loss of access to these facilities may result in increased costs, delays in the development of our drug candidates or interruption of our business operations. Natural disasters or pandemics such as the COVID-19 outbreak could further disrupt our operations, and have a material and adverse effect on our business, financial condition, results of operations and prospects. For example, we have instituted a temporary work from home policy for non-essential office personnel and it is possible that this could have a negative impact on the execution of our business plans and operations, especially because we rely on validating some of the drug discovery biology in our wet lab. Furthermore, our wet lab houses the robots used to

produce our dataset that builds the Recursion Data Universe which is a key means by which we conduct drug candidate discovery. If a natural disaster, power outage or other event occurred that prevented us from using all or a significant portion of our headquarters or the datacenter where we colocate our GPU cluster, or damaged critical infrastructure or our robots, such as our research facilities or the manufacturing facilities of our third-party contract manufacturers, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible, for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place may prove inadequate in the event of a serious disaster or similar event. Furthermore, we do not have a disaster recovery and business continuity plan for systems related to chemistry. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which could have a material adverse effect on our business. As part of our risk management policy, we maintain insurance coverage at levels that we believe are appropriate for our business. However, in the event of an accident or incident at these facilities, we cannot assure our investors that the amounts of insurance will be sufficient to satisfy any damages and losses. If our facilities or the manufacturing facilities of our third-party contract manufacturers are unable to operate because of an accident or incident or for any other reason, even for a short period of time, any or all of our research and development programs may be harmed. Any business interruption may have a material and adverse effect on our business, financial condition, results of operations and prospects.

Furthermore, our facilities in Salt Lake City, Utah are located in a busy downtown area. Although we believe we have taken the necessary steps to ensure our operations are safe to the surrounding area, there could be a risk to the public if we were to conduct hazardous material research, including use of flammable chemicals and materials, at our facilities. To date, we have not received any complaints from the public associated with our operations. From time to time, we also hold public events in our Salt Lake City facilities. We have protocols in place to protect our facilities and the confidential information and assets inside; however, it is difficult to secure certain portions of our facilities and security of our confidential and proprietary information could be compromised. Despite the steps we have taken, the surrounding community may still perceive our facility as unsafe, which could have a material and adverse effect on our reputation and operations.

Unfavorable global economic conditions could adversely affect our business, financial condition or results of operations.

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets. For example, in 2008, the global financial crisis caused extreme volatility and disruptions in the capital and credit markets and the current COVID-19 pandemic has caused significant volatility and uncertainty in U.S. and international markets. A severe or prolonged economic downturn could result in a variety of risks to our business, including weakened demand for our drug candidates and impaired ability to raise additional capital when needed on acceptable terms, if at all. A weak or declining economy could also strain our suppliers or possibly result in supply disruption. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the current economic climate and financial market conditions could adversely impact our business.

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 periodically subject to claims that arise in the ordinary course of business, such as claims brought by our collaborators or suppliers 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 demand 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 and management distraction, negatively affecting our business, financial condition and results of operations.

If we fail to comply with environmental, health and safety, or other laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

We are subject to numerous environmental, health and safety, and other laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological and radioactive materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials.

Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

Under Section 382 of the Internal Revenue Code of 1986, as amended, or the Code, if a corporation undergoes an "ownership change," which is generally defined as a greater than 50% change by value in the ownership of its equity over a three-year period, our ability to use our pre-change net operating loss carryforwards and certain other pre-change tax attributes to offset its post-change income could be subject to an annual limitation. Such annual limitation could result in the expiration of a portion of the net operating loss carryforward before utilization. If not utilized the carryforwards will begin to expire in 2036. We may have experienced such ownership changes in the past, and we may experience ownership changes in the future as a result of this offering or subsequent shifts in our stock ownership, some of which are outside of our control; however, we have not determined whether an ownership change has occurred. As of December 31, 2020, we had federal net operating loss carryforwards of approximately $ million, and our ability to utilize those net operating loss carryforwards could be limited by enacted legislation or an "ownership change" as described above, which could result in increased tax liability to us.

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 generally accepted accounting principles in the United States, or U.S. 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 Use of 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 stock-based compensation and valuation of our equity investments in early-stage biotechnology companies. 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 Our Reliance on Third Parties

We expect to rely on third parties to conduct our clinical trials and some aspects of our research and preclinical testing, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials, research, or testing.

We currently rely and expect to continue to rely on third parties, such as clinical research organizations, clinical data management organizations, medical institutions, and clinical investigators, to conduct some aspects of research and preclinical testing and clinical trials. Any of these third parties may terminate their engagements with us or be unable to fulfill their contractual obligations. If any of our relationships with these third parties terminate, we may not be able to enter into arrangements with alternative third parties on commercially reasonable terms, or at all. If we need to enter into alternative arrangements, it would delay product development activities.

Our reliance on these third parties for research and development activities reduces control over these activities but does not relieve us of our responsibilities. For example, we remain responsible for ensuring that each of our respective clinical trials is conducted in accordance with the general investigational plan and protocols for the trial and applicable legal, regulatory, and scientific standards, and our reliance on third parties does not relieve us of our regulatory responsibilities. In addition, the FDA and comparable foreign regulatory authorities require compliance with good clinical practices, or GCP guidelines, for conducting, recording, and reporting the results of clinical trials to assure that data and reported results are credible, reproducible and accurate and that the rights, integrity, and confidentiality of trial participants are protected. Regulatory authorities enforce GCP compliance through periodic inspections of trial sponsors, principal investigators, and trial sites. If we or any of these third parties fail to comply with applicable GCP regulations, some or all of the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional nonclinical or clinical trials or to enroll additional patients before approving our marketing applications. We cannot be certain that, upon inspection, such regulatory authorities will determine that any of our clinical trials complies with the GCP regulations. For any violations of laws and regulations during the conduct of clinical trials, we could be subject to untitled and warning letters or enforcement action that may include civil penalties up to and including criminal prosecution. We also are required to register ongoing clinical trials and post the results of completed clinical trials on a government-sponsored database within certain timeframes. Failure to do so can result in fines, adverse publicity, and civil and criminal sanctions.

If these third parties do not successfully carry out their contractual duties, meet expected deadlines, or conduct clinical trials in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, marketing approvals for any drug candidates we may develop and will not be able to, or may be delayed in our efforts to, successfully commercialize our medicines. Our failure or the failure of these third parties to comply with applicable regulatory requirements or our stated protocols could also subject us to enforcement action.

We contract with third parties for the manufacture of our drug candidates for preclinical development, clinical testing, and expect to continue to do so for commercialization. This reliance on third parties increases the risk that we will not have sufficient quantities of our drug candidates or products or such quantities at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We do not currently own or operate any manufacturing facilities or personnel, although we are in the process of securing a facility to establish production capabilities for preclinical animal studies and early human clinical trials. We rely, and could expect to continue to rely, on third parties for the manufacture of many of our drug candidates for preclinical development and clinical testing, as well as for the commercial manufacture of our products if any of our drug candidates receive marketing approval. This reliance on third parties increases the risk that we will not have sufficient quantities of our drug candidates or products or such quantities at an acceptable cost or quality, which could delay, prevent or impair our development or commercialization efforts.

The facilities used by our contract manufacturers to manufacture our drug candidates must be inspected by the FDA pursuant to pre-approval inspections that will be conducted after we submit our marketing applications to the FDA. We do not control the manufacturing process of, and will be completely dependent on, our contract manufacturers for compliance with current good manufacturing practice guidelines, or cGMP, in connection with the manufacture of our drug candidates in the near to intermediate term or possibly long term. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or others, they will not be able to pass regulatory inspections and/or maintain regulatory compliance for their manufacturing facilities. In addition, we have no control over the ability of our contract manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority finds deficiencies with or does not approve these facilities for the manufacture of our drug candidates or if it finds deficiencies or withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our drug candidates, if approved. Further, our failure, or the failure of our third- party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of drug candidates or products, if approved, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect our business and supplies of our drug candidates. Our third-party manufacturers may be subject to third-party litigation which could disrupt our supply chain, result in liability and harm our business, including the need to increase prices in connection with the commercialization of future drug candidates.

We may be unable to establish any agreements with third-party manufacturers or to do so on acceptable terms. Even if we are able to establish agreements with third-party manufacturers, reliance on third-party manufacturers entails additional risks, including:

- reliance on the third party for regulatory compliance and quality assurance;
- the possible breach of the manufacturing agreement by the third party;
- the possible misappropriation of our proprietary information, including our trade secrets and know-how; and

- the possible termination or nonrenewal of the agreement by the third party at a time that is costly or inconvenient for us.

Our drug candidates and any products that we may develop may compete with other drug candidates and approved products for access to manufacturing facilities or capacity. There are a limited number of manufacturers that operate under cGMP regulations and that might be capable of manufacturing for us.

Any performance failure on the part of our existing or future manufacturers could delay clinical development or marketing approval. If our current contract manufacturers cannot perform as agreed, we may be required to replace such manufacturers. We may incur added costs and delays in identifying and qualifying any such replacement.

Our current and anticipated future dependence upon others for the manufacture of our drug candidates or products may adversely affect our future profit margins and our ability to commercialize any products that receive marketing approval on a timely and competitive basis.

We also expect to rely on other third parties to store and distribute drug supplies for our clinical trials. Any performance failure on the part of our distributors could delay clinical development or marketing approval of any drug candidates we may develop or commercialization of our medicines, producing additional losses and depriving us of potential product revenue.

The third parties upon whom we rely for certain equipment and the supply of the active pharmaceutical ingredients used in our drug candidates are our only source of supply, and the loss of any of these suppliers could significantly harm our business.

Certain of our specialized equipment and the active pharmaceutical ingredients, or API, used in our drug candidates are supplied to us from single-source suppliers. Our ability to successfully develop our drug candidates, and to ultimately supply our commercial products in quantities sufficient to meet the market demand, depends in part on our ability to obtain equipment and the API for these products in accordance with regulatory requirements and in sufficient quantities for clinical testing and commercialization. We do not currently have arrangements in place for a redundant or second-source supply of any such equipment or API in the event any of our current suppliers of such equipment or API ceases their operations for any reason. We are also unable to predict how changing global economic conditions or potential global health concerns such as the COVID-19 pandemic will affect our third-party suppliers and manufacturers. Any negative impact of such matters on our third-party suppliers and manufacturers may also have an adverse impact on our results of operations or financial condition.

For all of our drug candidates, we intend to identify and qualify additional vendors and manufacturers to provide such equipment or API prior to submission of an NDA to the FDA and/or an MAA to the EMA. We are not certain, however, that our single-source suppliers will be able to meet our demand for their products, either because of the nature of our agreements with those suppliers, our limited experience with those suppliers or our relative importance as a customer to those suppliers. It may be difficult for us to assess their ability to timely meet our demand in the future based on past performance. While our suppliers have generally met our demand for their products on a timely basis in the past, they may subordinate our needs in the future to their other customers.

Establishing additional or replacement suppliers for certain equipment and the API used in our drug candidates, if required, may not be accomplished quickly. If we are able to find a replacement supplier, such replacement supplier would need to be qualified and may require additional regulatory inspection or approval, which could result in further delay. While we seek to maintain adequate

inventory of the API used in our drug candidates, any interruption or delay in the supply of components or materials, or our inability to obtain such API from alternate sources at acceptable prices in a timely manner could impede, delay, limit or prevent our development efforts, which could harm our business, results of operations, financial condition and prospects.

We may seek to establish additional collaborations for clinical development or commercialization of our drug candidates, and, if we are not able to establish them on commercially reasonable terms, or at all, we may have to alter our development and commercialization plans.

Our product development programs and the potential commercialization of our drug candidates will require substantial additional cash to fund expenses. For some of our drug candidates, we may decide to collaborate with additional pharmaceutical and biotechnology companies for the development and potential commercialization of those drug candidates. In the near term, the value of our company will depend in part, on the number of and the quality of the collaborations that we create.

Potential collaborators may reject collaborations based upon their assessment of our financial, regulatory or intellectual property position. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside the United States, the potential market for the subject drug candidate, the costs and complexities of manufacturing and delivering such drug candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge and industry and market conditions generally. The collaborator may also consider alternative drug candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us for our drug candidate. The terms of any additional collaborations or other arrangements that we may establish may not be favorable to us.

Collaborative relationships with third parties could cause us to expend significant resources and incur substantial business risk with no assurance of financial return. Management of our relationships with collaborators will require:

- significant time and effort from our management team;
- coordination of our marketing and research and development programs with the marketing and research and development priorities of our collaborators; and
- effective allocation of our resources to multiple projects.

If we are unable to establish or maintain such strategic collaborations on terms favorable to us in the future, our research and development efforts and potential to generate revenue may be limited.

We may also be restricted under collaboration agreements from entering into future agreements on certain terms with potential collaborators. Collaborations are complex and time-consuming to negotiate and document. In addition, the significant number of recent business combinations among large pharmaceutical companies has resulted in a reduced number of potential future collaborators.

We may not be able to negotiate additional collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of the drug candidate for which we are seeking to collaborate, reduce or delay its development program or one or more of our

other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop our drug candidates or bring them to market and generate product revenue. Even if we successfully establish new collaborations, these relationships may never result in the successful development or commercialization of drug candidates or the generation of sales revenue. The success of our collaboration arrangements will depend heavily on the efforts and activities of our collaborators. Collaborators generally have significant discretion in determining the efforts and resources that they will apply to these collaborations. To the extent that we enter into collaborative arrangements, the related product revenues are likely to be lower than if we directly marketed and sold products. Such collaborators may also consider alternative drug candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us for any future drug candidate. Disagreements between parties to a collaboration arrangement regarding clinical development or commercialization matters can lead to delays in the development process or commercialization of the applicable drug candidate and, in some cases, the termination of the collaboration arrangement. These disagreements can be difficult to resolve if neither of the parties has final decision-making authority. Collaborations with pharmaceutical or biotechnology companies or other third parties often are terminated or allowed to expire by the other party. Any such termination or expiration would adversely affect us financially and could harm our business reputation. If we were to become involved in arbitration or litigation with any of our collaborators it would consume time and divert management resources away from operations, damage our reputation and impact our ability to enter into future collaboration agreements and may result in substantial payments from us to our collaborators to settle any disputes.

Risks Related to Our Intellectual Property

If we are unable to adequately protect and enforce our intellectual property and proprietary technology or obtain and maintain patent protection for our technology and products or if the scope of the patent protection obtained is not sufficiently broad, our competitors could develop and commercialize technology and products similar or identical to ours, and our ability to successfully commercialize our technology and products may be impaired.

Our commercial success will depend in part on our ability to obtain, maintain, protect and enforce our proprietary and intellectual property rights in the United States and other countries for our drug candidates, and our core technologies, including our phenomic platform, preclinical and clinical assets, composition of matter, methods of use and formulation patents and related know-how. We seek to protect our proprietary and intellectual property position by, among other methods, filing patent applications in the United States and abroad related to our proprietary technology, inventions and improvements that are important to the development and implementation of our business. However, the patent process is expensive, time consuming and complex, and we may not be able to apply for patents on certain aspects of our technology and products in a timely fashion, at a reasonable cost, in all jurisdictions or at all, and any potential patent coverage we obtain may not be sufficient to prevent substantial competition. In addition, we also rely on trade secrets, know-how and continuing technological innovation to develop and maintain our proprietary and intellectual property position. We do not own or in-license any issued patents with respect to certain of our programs, including our REC-3599 product candidate, our lead molecules for the treatment of C. Difficile Colitis (REC-163964, REC-164014, and REC-164067), our lead molecules for the treatment of neuroinflammation (REC-648455, REC-648597, and REC-648677), our lead molecules for the treatment of Batten Disease (REC-648190, REC-259618, and REC-648647), or the lead molecules for the treatment of CMT2A (REC-64810, REC-648458, REC-1262, and REC-150357), REC-64151 for the Treatment of

STK11 Immune Checkpoint Resistance and MYC Inhibitory Molecules for the Treatment of Solid and Hematological Malignancies we can provide no assurance that any of our current or future patent applications will result in issued patents or that any issued patents will provide us with any competitive advantage.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation.

The degree of patent protection we require to successfully commercialize our drug candidates may be unavailable or severely limited in some cases and may not adequately protect our rights or permit us to gain or keep any competitive advantage. We cannot provide any assurances that any of our pending patent applications will issue, or that any of our pending patent applications that mature into issued patents will include claims with a scope sufficient to protect our drug candidates from competition. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States, and many companies have encountered significant challenges in establishing and enforcing their proprietary rights outside of the United States. Furthermore, patents have a limited lifespan. In the United States, the natural expiration of a patent is generally twenty years after its first effective non-provisional filing date. Various extensions may be available; however, the life of a patent, and the protection it affords, is limited. Given the amount of time required for the development, testing and regulatory review of new drug candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our owned patent portfolio and any patent portfolio we may license in the future may not provide us with adequate and continuing patent protection sufficient to exclude others from commercializing products similar or identical to our drug candidates, including generic versions of such products.

Other parties have developed technologies that may be related or competitive to our own, and such parties may have filed or may file patent applications, or may have received or may receive patents, claiming inventions that may overlap or conflict with those claimed in our own patent. Publications of discoveries in scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot know with certainty whether we or our licensors were the first to make the inventions claimed in our owned or licensed patents or pending patent applications, or that we or our licensors were the first to file for patent protection of such inventions. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights cannot be predicted with any certainty.

In addition, the patent prosecution process is expensive, time-consuming and complex, and we may not be able to file, prosecute, maintain, enforce or license all necessary or desirable patent applications at a reasonable cost or in a timely manner. Further, with respect to most of the pending patent applications covering our drug candidates, prosecution has yet to commence. Patent prosecution is a lengthy process, during which the scope of the claims initially submitted for examination by the U.S. Patent and Trademark Office, or USPTO, may be significantly narrowed by the time they issue, if at all. It is also possible that we will fail to identify patentable aspects of our research and development output in time to obtain patent protection. Moreover, in some circumstances, we do not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering technology that we license from third parties. We may also require the cooperation of our licensors and collaborators to enforce any licensed patent rights, and such cooperation may not be provided. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business.

We currently own a number of U.S. provisional patent applications. U.S. provisional patent applications are not eligible to become issued patents until, among other things, we file a

non-provisional patent application within 12 months of filing one or more of our related provisional patent applications. With regard to such U.S. provisional patent applications, if we do not timely file any non-provisional patent applications, we may lose our priority dates with respect to our provisional patent applications and any patent protection on the inventions disclosed in our provisional patent applications. Further, in the event that we do timely file non-provisional patent applications relating to our provisional patent applications, we cannot predict whether any such patent applications will result in the issuance of patents or if such issued patents will provide us with any competitive advantage.

Even if we acquire patent protection that we expect should enable us to maintain such competitive advantage, third parties may challenge the validity, enforceability or scope thereof, which may result in such patents being narrowed, invalidated or held unenforceable. The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. For example, we may be subject to a third-party submission of prior art to the USPTO challenging the priority of an invention claimed within one of our patents, which submissions may also be made prior to a patent's issuance, precluding the granting of any of our pending patent applications. Further, inadvertent disclosures to the public of our inventions prior to the filing of a patent application have and in the future may preclude us from obtaining patent protection in certain jurisdictions. We may become involved in opposition, derivation, reexamination, inter parties review, post-grant review or interference proceedings challenging our patent rights or the patent rights of others from whom we have obtained licenses to such rights. Such proceedings could result in revocation of or amendment to our patents in such a way that they no longer cover our technology or drug candidates.

Competitors may claim that they invented the inventions claimed in our issued patents or patent applications prior to us, or may file patent applications before we do. Competitors may also claim that we are infringing on their patents and that we therefore cannot practice our technology as claimed under our patents, if issued. Competitors may also contest our patents, if issued, by showing the patent examiner that the invention was not original, was not novel or was obvious. In litigation, a competitor could claim that our patents, if issued, are not valid for a number of reasons. If a court agrees, we would lose our rights to those challenged patents.

In addition, we may in the future be subject to claims by our former employees or consultants asserting an ownership right in our patents or patent applications, as a result of the work they performed on our behalf. Although we generally require all of our employees, consultants and advisors and any other third parties who have access to our proprietary know-how, information or technology to assign or grant similar rights to their inventions to us, we cannot be certain that we have executed such agreements with all parties who may have contributed to our intellectual property, nor can we be certain that our agreements with such parties will be upheld in the face of a potential challenge, or that they will not be breached, for which we may not have an adequate remedy. A loss of exclusivity, in whole or in part, could allow others to compete with us and harm our business.

An adverse determination in any such submission or proceeding may result in loss of exclusivity or freedom to operate or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, without payment to us, or could limit the duration of the patent protection covering our technology and drug candidates. Such challenges may also result in our inability to manufacture or commercialize our drug candidates without infringing third-party patent rights. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future drug candidates.

Even if they are unchallenged, our owned patent portfolio and any patent portfolio we may license in the future may not provide us with any meaningful protection or prevent competitors from designing

around our patent claims to circumvent our owned or licensed patents by developing similar or alternative technologies or products in a non-infringing manner. For example, a third party may develop a competitive product that provides benefits similar to one or more of our drug candidates but that has a different composition that falls outside the scope of our patent protection. If the patent protection provided by the patents and patent applications we hold or pursue with respect to our drug candidates is not sufficiently broad to impede such competition, our ability to successfully commercialize our drug candidates could be negatively affected, which would harm our business.

Obtaining and maintaining patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application and prosecution process. In addition, periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or patent applications often must be paid to the USPTO and foreign patent agencies over the lifetime of the patent and/or patent application. While an unintentional lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Non-compliance events that could result in abandonment or lapse of a patent or patent application include, but are not limited to, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. If we fail to maintain the patents and patent applications covering our products or procedures, we may not be able to stop a competitor from marketing products that are the same as or similar to our drug candidates, which would have a material adverse effect on our business.

If we are unable to protect the confidentiality of our trade secrets and know-how, our business and competitive position may be harmed.

In addition to the protection afforded by patents, we rely upon unpatented trade secret protection, unpatented know-how and continuing technological innovation to develop and maintain our competitive position. With respect to curating our data and our library of small molecules generally, we consider trade secrets and know-how to be our primary intellectual property. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our collaborators, scientific advisors, employees and consultants, and invention assignment agreements with our consultants and employees. We may not be able to prevent the unauthorized disclosure or use of information which we consider to be confidential, our technical know-how or other trade secrets by the parties to these agreements, however, despite the existence generally of confidentiality agreements and other contractual restrictions. Monitoring unauthorized uses and disclosures is difficult, and we do not know whether the steps we have taken to protect our proprietary technologies will be effective. If any of the collaborators, scientific advisors, employees and consultants who are parties to these agreements breaches or violates the terms of any of these agreements, we may not have adequate remedies for any such breach or violation, and we could lose our trade secrets as a result. For example, if one of our employees publicly discloses information that we believe to be confidential or a trade secret we may be unable to protect it in the future. Even where remedies are available, enforcing a claim that a party illegally disclosed or misappropriated our trade secrets, like patent litigation, is expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the United States are sometimes less willing to protect trade secrets.

Our trade secrets could otherwise become known or be independently discovered by our competitors. Competitors could purchase our drug candidates and attempt to replicate some or all of

the competitive advantages we derive from our development efforts, willfully infringe our intellectual property rights, design around our protected technology or develop their own competitive technologies that fall outside of our intellectual property rights. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor or other third party, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us.

Third parties may initiate legal proceedings alleging that we are infringing, misappropriating or otherwise violating their intellectual property or proprietary 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 and the ability of our collaborators to develop, manufacture, market and sell our drug candidates and use our proprietary technologies without infringing, misappropriating or otherwise violating the intellectual property or proprietary rights of third parties. The biotechnology and pharmaceutical industries are characterized by extensive and frequent litigation regarding patents and other intellectual property rights. For example, we sublicense CRISPR-Cas9 gene editing technology from a licensed vendor, which provides critical tools upon which portions of our drug discovery process relies, but there are ongoing disputes between third parties, which we are not party to, regarding the ownership of and licensing rights related to such technology. CRISPR-Cas9 gene editing is a field that is highly active for patent filings. In November 2018, it was reported that 211 patent families and 1835 patent family members worldwide referenced CRISPR or Cas in the title, abstracts or claims. The extensive patent filings related to CRISPR and Cas make it difficult for us to assess the full extent of relevant patents and pending applications that may cover CRISPR-Cas9. There may be third-party patents or pending patent applications with claims that may issue in the future, covering our use of CRISPR-Cas9. We may need access to such patents in order to continue using CRISPR-Cas9, however we cannot be certain that such patents will be available for license on commercially reasonable terms. We may in the future become party to, or threatened with, adversarial proceedings or litigation regarding intellectual property rights with respect to our drug candidates and technology, including interference proceedings before the USPTO. Our competitors or other third parties may assert infringement claims against us, alleging that our products or technologies are covered by their patents. Given the vast and continually-increasing number of patents in our field of technology, we cannot be certain that we do not infringe existing patents or that we will not infringe patents that may be granted in the future. Many companies have filed, and continue to file, patent applications related to artificial intelligence and deep learning, technology-aided drug discovery, CRISPR, high-throughput screening, and combinations of any or all of these fields. Some of these patent applications have already been allowed or issued, and others may issue in the future. Since these areas are competitive and of strong interest to pharmaceutical and biotechnology companies, there will likely be additional patent applications filed and additional patents granted in the future, as well as additional research and development programs expected in the future. If a patent holder believes our product or drug candidate infringes on its patent, the patent holder may sue us even if we have received patent protection for our technology. Moreover, we may face patent infringement claims from non-practicing entities that have no relevant product revenue and against whom our owned patent portfolio and any patent portfolio we may license in the future may thus have no deterrent effect. If any such claim or proceeding is brought against us, our collaborators or our third-party service providers, our development, manufacturing, marketing, sales and other commercialization activities could be similarly adversely affected. Even if we believe third-party intellectual property claims are without merit, there is no assurance that a court would find in our favor on questions of infringement, validity, enforceability, or priority. A court of competent jurisdiction could hold that third-party patents asserted against us are valid, enforceable, and infringed, which could materially and adversely affect our ability to develop, manufacture, market, sell and commercialize any of our drug candidates or technology. In order to successfully challenge the validity of any such U.S. patent in federal court, we would need to overcome a presumption of validity. As this burden is a high one requiring us to present clear and

convincing evidence as to the invalidity of any such U.S. patent claim, there is no assurance that a court of competent jurisdiction would invalidate the claims of any such U.S. patent.

If we are found to infringe a third party's patent or other intellectual property rights, we could be required to obtain a license from such third party to continue developing and marketing our drug candidates and technology. We may choose to obtain a license, even in the absence of an action or finding of infringement. In either case, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain such a license, it could be granted on non-exclusive terms, thereby providing our competitors and other third parties access to the same technologies licensed to us, and it could require us to make substantial licensing, royalty and other payments. Without such a license, we could be forced, including by court order, to cease developing and commercializing the infringing technology or drug candidates. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees if we are found to have willfully infringed such third-party patent or other intellectual property rights. A finding of infringement could prevent us from commercializing our drug candidates or force us to cease some of our business operations, which could materially harm our business. If we lose a foreign patent lawsuit, alleging our infringement of a competitor's patents, we could be prevented from marketing our products in one or more foreign countries, which would have a materially adverse effect on our business.

We may be subject to damages resulting from claims that we or our employees have wrongfully used or disclosed alleged trade secrets of our competitors or are in breach of non-competition or non-solicitation agreements with our competitors or claims asserting ownership of what we regard as our own intellectual property.

We could in the future be subject to claims that we or our employees have inadvertently or otherwise used or disclosed alleged trade secrets or other proprietary information of former employers or competitors. Although we try to ensure that our employees and consultants do not use the intellectual property, proprietary information, know-how or trade secrets of others in their work for us, we may in the future be subject to claims that we caused an employee to breach the terms of his or her non-competition or non-solicitation agreement, or that we or these individuals have, inadvertently or otherwise, used or disclosed the alleged trade secrets or other proprietary information of a former employer or competitor. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial costs and could be a distraction to management. If our defenses to these claims fail, in addition to requiring us to pay monetary damages, a court could prohibit us from using technologies or features that are essential to our drug candidates, if such technologies or features are found to incorporate or be derived from the trade secrets or other proprietary information of the former employers. An inability to incorporate such technologies or features would have a material adverse effect on our business, and may prevent us from successfully commercializing our drug candidates. In addition, we may lose valuable intellectual property rights or personnel as a result of such claims. Moreover, any such litigation or the threat thereof may adversely affect our ability to hire employees or contract with independent sales representatives. A loss of key personnel or their work product could hamper or prevent our ability to commercialize our drug candidates, which would have an adverse effect on our business, results of operations and financial condition.

In addition, while it is our policy to require our employees and contractors who may be involved in the conception or development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who, in fact, conceives or develops intellectual property that we regard as our own. The assignment of intellectual property rights may not be self-executing, or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property. Such claims could have an adverse effect on our business, results of operations and financial condition.

We may become involved in lawsuits to protect or enforce our patents and other intellectual property rights, which could be expensive, time consuming and unsuccessful.

Competitors and other third parties may infringe, misappropriate or otherwise violate our patents and other intellectual property rights. To counter infringement or unauthorized use, we may be required to file infringement claims. A court may disagree with our allegations, however, and may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover it. Further, such third parties could counterclaim that we infringe their intellectual property or that a patent we have asserted against them is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims and *inter partes* reviews challenging the validity, enforceability or scope of asserted patents are commonplace. In addition, third parties may initiate legal proceedings against us to assert such challenges to our intellectual property rights. The outcome of any such proceeding is generally unpredictable. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement. Patents may be unenforceable if someone connected with prosecution of the patent withheld relevant information from the USPTO or made a misleading statement during prosecution. It is possible that prior art of which we and the patent examiner were unaware during prosecution exists, which could render any patents that may issue invalid. Moreover, it is also possible that prior art may exist that we are aware of but do not believe is relevant to our future patents, should they issue, but that could nevertheless be determined to render our patents invalid.

An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated or interpreted narrowly. If a defendant were to prevail on a legal assertion of invalidity or unenforceability of our patents covering one of our drug candidates, we would lose at least part, and perhaps all, of the patent protection covering such drug candidate or technology. Competing products may also be sold in other countries in which our patent coverage might not exist or be as strong.

Intellectual property litigation could cause us to spend substantial resources and distract our personnel from their normal responsibilities.

Litigation or other legal proceedings relating to intellectual property claims, with or without merit, is unpredictable and generally expensive and time consuming and is likely to divert significant resources from our core business, including distracting our technical and management personnel from their normal responsibilities. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities.

We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources and more mature and developed intellectual property portfolios. Accordingly, despite our efforts, we may not be able to prevent third parties from infringing upon or misappropriating or from successfully challenging our intellectual property rights. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

We may not be able to effectively prosecute and enforce our intellectual property rights throughout the world.

Filing, prosecuting and defending patents on our drug candidates in all countries throughout the world would be prohibitively expensive. The requirements for patentability may differ in certain countries, particularly in developing countries. Moreover, our ability to protect and enforce our intellectual property rights may be adversely affected by unforeseen changes in foreign intellectual property laws. Patent protection must ultimately be sought on a country-by-country basis, which is an expensive and time-consuming process with uncertain outcomes. Accordingly, we may choose not to seek patent protection in certain countries, and we will not have the benefit of patent protection in such countries. Additionally, the patent laws of some foreign countries, including some jurisdictions of significant commercial interest, do not afford intellectual property protection to the same extent as the laws of the United States, particularly with regard to software technologies and methods of treatment involving existing drugs. Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. The legal systems of some countries, particularly developing countries, do not favor the enforcement of patents and other intellectual property rights. This could make it difficult for us to stop the infringement of our patents, if obtained, or the misappropriation of our other intellectual property rights. For example, many foreign countries have compulsory licensing laws under which a patent owner must grant licenses to third parties and/or which limit the enforceability of patents against third parties, including government agencies or government contractors. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States and, in those foreign countries, patents may provide limited or no benefit. In addition, we and our licensors may have limited remedies in those foreign countries if patents are infringed or if we or our licensors are compelled to grant a license to a third party, which could materially diminish the value of those patents and could limit our potential revenue opportunities.

Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we have patent protection, if our ability to enforce our patents to stop infringing activities is inadequate. These products may compete with our drug candidates, and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing. Proceedings to enforce our patent rights in foreign jurisdictions, whether or not successful, could result in substantial costs and divert our efforts and resources from other aspects of our business. Furthermore, while we intend to protect our intellectual property rights in the major markets for our drug candidates, we cannot ensure that we will be able to initiate or maintain similar efforts, or obtain similar patent scope, in all jurisdictions in which we may wish to market our drug candidates. Accordingly, our efforts to protect our intellectual property rights in such countries may be inadequate to obtain a significant commercial advantage from the intellectual property that we own or license.

If we do not obtain patent term extension and data exclusivity for any drug candidates we may develop, our business may be materially harmed.

Depending upon the timing, duration and specifics of any FDA marketing approval of any drug candidates we may develop, one or more of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Action of 1984, or Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit a patent extension term of up to five years as compensation for patent term lost during the FDA regulatory review process. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval; only one patent may be extended and only those claims covering the approved drug, a method for using it or a method for manufacturing it may be extended. However, we may not be granted an extension because of, for example, failing to exercise due diligence during the testing

phase or regulatory review process, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term extension or term of any such extension is less than we request, our competitors may obtain approval of competing products following our patent expiration, and our business, financial condition, results of operations and prospects could be materially harmed.

We may need to license certain intellectual property from third parties, and such licenses may not be available or may not be available on commercially reasonable terms.

A third party may hold intellectual property, including patent rights, that are important or necessary to the development of our products. It may be necessary for us to use the patented or proprietary technology of third parties to commercialize our products, in which case we would be required to obtain a license from these third parties on commercially reasonable terms, or our business could be harmed, possibly materially. For example, when we explore repurposing molecules owned by our collaboration partners or other third parties, we in-license the rights to use those molecules for our use. If we were not able to obtain a license, or were not able to obtain a license on commercially reasonable terms or with sufficient breadth to cover the intended use of third-party intellectual property, our business could be materially harmed or we may become involved in disputes.

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

We license certain intellectual property that is important to our business, and in the future we may enter into additional agreements that provide us with licenses to valuable intellectual property or technology. We expect our future license agreements will impose various development, diligence, commercialization, and other obligations on us in order to maintain the licenses. In spite of our efforts, a future licensor might conclude that we have materially breached our obligations under such license agreements and seek to terminate the license agreements, thereby removing or limiting our ability to develop and commercialize products and technology covered by these license agreements. If these in-licenses are terminated, or if the underlying patent rights licensed thereunder fail to provide the intended exclusivity, competitors or other third parties would have the freedom to seek regulatory approval of, and to market, products identical to ours and we may be required to cease our development and commercialization of certain of our drug candidates. Any of the foregoing could have a material adverse effect on our competitive position, business, financial conditions, results of operations, and prospects.

Moreover, disputes may arise regarding intellectual property subject to a licensing agreement, including:

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

The agreements under which we may license intellectual property or technology from third parties may be complex, and certain provisions in such agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology, or increase what we believe to be our financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations, and prospects. Moreover, if disputes over intellectual property that we have licensed prevent or impair our ability to maintain our licensing arrangements on commercially acceptable terms, we may be unable to successfully develop and commercialize the affected drug candidates, which could have a material adverse effect on our business, financial conditions, results of operations, and prospects.

These and similar issues may arise with respect to our collaboration agreements, such as the Bayer Agreement. Our collaboration with Bayer is one of our key collaborations, and there can be no assurance that this collaboration will continue past the current term, on favorable terms or at all, or that at any time while the collaboration is in effect the parties will operate under the agreement without disputes. Possible disputes may involve ownership or control of intellectual property rights, negotiations of licensing agreements resulting from the collaboration, exclusivity obligations, diligence and payment obligations, for example.

Some of our intellectual property has been discovered through government funded programs and thus may be subject to federal regulations such as "march-in" rights, certain reporting requirements and a preference for U.S.-based companies, and compliance with such regulations may limit our exclusive rights and our ability to contract with non-U.S. manufacturers.

Our intellectual property rights may be subject to a reservation of rights by one or more third parties. For example, certain intellectual property rights that we have licensed have been generated through the use of U.S. government funding and are therefore subject to certain federal regulations. As a result, the U.S. government may have certain rights to intellectual property embodied in our current or future processes and related products and services pursuant to the Bayh-Dole Act of 1980, or the Bayh-Dole Act. These U.S. government rights include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right, under certain limited circumstances, to require the licensor to grant exclusive, partially exclusive or non-exclusive licenses to any of these inventions to a third party if it determines that (1) adequate steps have not been taken to commercialize the invention and achieve practical application of the government-funded technology, (2) government action is necessary to meet public health or safety needs, (3) government action is necessary to meet requirements for public use under federal regulations or (4) we fail to meet requirements of federal regulations (also referred to as "march-in rights"). The U.S. government also has the right to take title to these inventions if we or our licensors fail to disclose the invention to the government or fail to file an application to register the intellectual property within specified time limits. These rights may permit the government to disclose our confidential information to third parties. In addition, our rights in such inventions may be subject to certain requirements to manufacture products embodying such inventions in the United States. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us to expend substantial resources. To the extent any of our future owned or licensed intellectual property is also generated through the use of U.S. government funding, the provisions of the Bayh-Dole Act may similarly apply. Any exercise by the government of such rights could have a material adverse effect on our competitive position, business, results of operations and financial condition.

Changes to the patent law in the United States and other jurisdictions could diminish the value of patents in general and may impact the validity, scope or enforceability of our patent rights, thereby impairing our ability to protect our drug candidates.

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve both technological and legal complexity and is therefore costly, time consuming, and inherently uncertain. Our patent rights, their associated costs, and the enforcement or defense of such patent rights may be affected by developments or uncertainty in the patent statute, patent case law or USPTO rules and regulations. Changes in either the patent laws or interpretation of the patent laws could increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of our issued patents. For example, in March 2013, under the Leahy-Smith America Invents Act, or the America Invents Act, the United States transitioned from a "first to invent" to a "first-to-file" patent system. Under a "first-to-file" system, assuming that other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to a patent on an invention regardless of whether another inventor had made the invention earlier. A third party that files a patent application in the USPTO after March 2013, but before us could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by such third party. This will require us to be cognizant going forward of the time from invention to filing of a patent application. Since patent applications in the United States and most other countries are confidential for a period of time after filing or until issuance, we cannot be certain that we or our licensors were the first to either file any patent application related to our technology or drug candidates or invent any of the inventions claimed in our or our licensor's patents or patent applications. The America Invents Act also includes a number of other significant changes to U.S. patent law, including provisions that affect the way patent applications will be prosecuted, allowing third party submission of prior art and establishing a new post-grant review system including post-grant review, *inter partes* review, and derivation proceedings. Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in United States federal courts necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action. The effects of these changes are currently unclear as the USPTO continues to promulgate new regulations and procedures in connection with the America Invents Act and many of the substantive changes to patent law, including the "first-to-file" provisions, only became effective in March 2013. In addition, the courts have yet to address many of these provisions and the applicability of the act and new regulations on the specific patents discussed in this filing have not been determined and would need to be reviewed. However, the America Invents Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

The U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. Additionally, there have been recent proposals for additional changes to the patent laws of the United States and other countries that, if adopted, could impact our ability to obtain patent protection for our proprietary technology or our ability to enforce rights in our proprietary technology. Depending on future actions by the U.S. Congress, the U.S. courts, the USPTO and the relevant law-making bodies in other countries, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce any patents that we may obtain in the future.

Intellectual property rights do not necessarily address all potential threats.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations and may not adequately protect our business or permit us to maintain our competitive advantage. For example:

- others may be able to make products that are similar to our drug candidates or utilize similar technology but that are not covered by the claims of the patents that we license or may own;
- others may be able to duplicate or utilize similar technology in a manner that infringes our patents but is undetectable, or done in a jurisdiction where we cannot secure or enforce patent rights;
- we or our licensors or collaborators, might not have been the first to make the inventions covered by the issued patent or pending patent application that we license or own now or in the future;
- we or our licensors or collaborators, might not have been the first to file patent applications covering certain of our or their inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our owned or licensed intellectual property rights;
- it is possible that our present or future pending patent applications (whether owned or licensed) will not lead to issued patents;
- issued patents that we hold rights to may be held invalid or unenforceable, including as a result of legal challenges by our competitors or other third parties;
- our competitors or other third parties might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- the patents of others may harm our business; and
- we may choose not to file a patent in order to maintain certain trade secrets or know-how, and a third party may subsequently file a patent covering such intellectual property.

Should any of these events occur, they could have a material adverse effect on our business, financial condition, results of operations and prospects.

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

Our registered or unregistered trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition among potential collaborators or customers in our markets of interest. At times, competitors may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other trademarks or trademarks that incorporate variations of our registered or unregistered trademarks or trade names. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected. We may license our trademarks and trade names to third parties, such as distributors. Though these license agreements may provide guidelines for how our trademarks and trade names may be used, a breach of these agreements or

misuse of our trademarks and trade names by our licensees may jeopardize our rights in or diminish the goodwill associated with our trademarks and trade names. Our efforts to enforce or protect our proprietary rights related to trademarks, trade names, trade secrets, know-how, domain names, copyrights or other intellectual property may be ineffective and could result in substantial costs and diversion of resources and could adversely affect our business, financial condition, results of operations and prospects.

We license patent rights from third-party owners. If such owners do not properly or successfully obtain, maintain, or enforce the patents underlying such licenses, our competitive position and business prospects may be harmed.

We are a party to license agreements that give us rights to third-party intellectual property that is necessary or useful for our business. For example we have obtained licenses from third parties to patent rights covering a number of our clinical drug candidates and licenses (implied or explicit) from certain other parties for technology used in our drug discovery efforts. We may enter into additional license agreements to third-party intellectual property in the future.

Our success will depend in part on the ability of our licensors to obtain, maintain, and enforce patent protection for our licensed products. Our licensors may not successfully prosecute the patent applications we license. Even if patents issue in respect of these patent applications, our licensors may fail to maintain these patents, may determine not to pursue litigation against other companies that are infringing these patents, or may pursue such litigation less aggressively than we would. Without protection for the intellectual property we license, other companies might be able to offer substantially identical products for sale, which could adversely affect our competitive business position and harm our business prospects.

Our current proprietary position for certain drug candidates depends upon our owned or in-licensed patent filings covering components of such drug candidates, manufacturing-related methods, formulations and/or methods of use, which may not adequately prevent a competitor or other third party from using the same drug candidate for the same or a different use.

Composition of matter patent protection is generally considered to be desirable for drug products because it provides protection without regard to any particular method of use or manufacture or formulation. For some of the molecules that we in-license from our collaboration partners, we cannot rely on composition of matter patent protection as the term on those patents has expired or is approximately expired.

Method of use patents protect the use of a product for the specified method and formulation patents cover formulations to deliver therapeutics. While we file applications covering method of use for our programs at appropriate times in the development process, we cannot be certain that claims in any future patents issuing from these applications will cover all commercially-relevant applications of molecules in competing uses. These types of patents do not prevent a competitor or other third party from developing, marketing or commercializing a similar or identical product for an indication that is outside the scope of the patented method or from developing a different formulation that is outside the scope of the patented formulation. Moreover, with respect to method of use patents, even if competitors or other third parties do not actively promote their product for our targeted indications or uses for which we may obtain patents, physicians may recommend that patients use these products off-label, or patients may do so themselves. Although off-label use may infringe or contribute to the infringement of method of use patents, the practice is common and this type of infringement is difficult to prevent or enforce. Consequently, we may not be able to prevent third parties from practicing our inventions in the United States or abroad. Additionally, some commercially-relevant jurisdictions do not allow for patents covering a new method of use of an otherwise-known molecule.

Risks Related to Government Regulation

Even if we receive regulatory approval for any of our drug candidates, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense. Additionally, our drug candidates, if approved, could be subject to post-market study requirements, marketing and labeling restrictions, and even recall or market withdrawal if unanticipated safety issues are discovered following approval. In addition, we may be subject to penalties or other enforcement action if we fail to comply with regulatory requirements.

The FDA may not approve any of our drug candidates derived from our platform given our novel approach to drug discovery and may elect to inspect our automated robotics platform used to generate our data. However, if the FDA or a comparable foreign regulatory authority approves any of our drug candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion and recordkeeping for the product will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, establishment registration and listing, as well as continued compliance with cGMPs and GCPs for any clinical trials that we conduct post-approval. Any regulatory approvals that we receive for our drug candidates may also be subject to limitations on the approved indicated uses for which the product may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing studies, and surveillance to monitor the safety and efficacy of the product. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of the product, withdrawal of the product from the market, or voluntary or mandatory product recalls;
- clinical trial holds
- fines, warning letters or other regulatory enforcement action;
- refusal by the FDA to approve pending applications or supplements to approved applications filed by us;
- product seizure or detention, or refusal to permit the import or export of products; and
- injunctions or the imposition of civil or criminal penalties.

The FDA's policies may change, and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our drug candidates. 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, we may lose any marketing approval that we may have obtained, which would adversely affect our business, prospects and ability to achieve or sustain profitability.

We may seek orphan drug designation for certain of our drug candidates, and we may be unsuccessful or may be unable to maintain the benefits associated with orphan drug designation, including the potential for market exclusivity.

As part of our business strategy, we may seek orphan drug designation for certain of our drug candidates, and we may be unsuccessful. Regulatory authorities in some jurisdictions, including the United States and Europe, may designate drugs for relatively small patient populations as orphan drugs. Under the Orphan Drug Act, the FDA may designate a drug as an orphan drug if it is a drug

intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals annually in the United States, or a patient population of 200,000 or more in the United States where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the United States. In the United States, orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages and user-fee waivers.

Similarly, in Europe, the European Commission, upon the recommendation of the EMA's Committee for Orphan Medicinal Products, grants orphan drug designation to promote the development of drugs that are intended for the diagnosis, prevention or treatment of life-threatening or chronically debilitating conditions affecting not more than 5 in 10,000 persons in Europe and for which no satisfactory method of diagnosis, prevention, or treatment has been authorized (or the product would be a significant benefit to those affected). Additionally, designation is granted for drugs intended for the diagnosis, prevention, or treatment of a life-threatening, seriously debilitating or serious and chronic condition and when, without incentives, it is unlikely that sales of the drug in Europe would be sufficient to justify the necessary investment in developing the drug. In Europe, orphan drug designation entitles a party to financial incentives such as reduction of fees or fee waivers.

Generally, if a drug with an orphan drug designation subsequently receives the first marketing approval for the indication for which it has such designation, the drug is entitled to a period of marketing exclusivity, which precludes the FDA or the EMA from approving another marketing application for the same drug and indication for that time period, except in limited circumstances. The applicable period is seven years in the United States and ten years in Europe. The European exclusivity period can be reduced to six years if a drug no longer meets the criteria for orphan drug designation or if the drug is sufficiently profitable so that market exclusivity is no longer justified.

Even if we obtain orphan drug exclusivity for a drug, that exclusivity may not effectively protect the drug from competition because different drugs can be approved for the same condition. Even after an orphan drug is approved, the FDA can subsequently approve a different drug for the same condition if the FDA concludes that the later drug is clinically superior in that it is shown to be safer, more effective or makes a major contribution to patient care. In addition, a designated orphan drug may not receive orphan drug exclusivity if it is approved for a use that is broader than the indication for which it received orphan designation. Moreover, orphan drug exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the drug to meet the needs of patients with the rare disease or condition or if another drug with the same active part of the molecule is determined to be safer, more effective, or represents a major contribution to patient care. Orphan drug designation neither shortens the development time or regulatory review time of a drug nor gives the drug any advantage in the regulatory review or approval process. While we may seek orphan drug designation for our drug candidates, we may never receive such designations. Even if we do receive such designations, there is no guarantee that we will enjoy the benefits of those designations.

Obtaining and maintaining regulatory approval of our drug candidates in one jurisdiction does not mean that we will be successful in obtaining regulatory approval of our drug candidates in other jurisdictions.

We may also submit marketing applications in other countries. Regulatory authorities in jurisdictions outside of the United States have requirements for approval of drug candidates with which we must comply prior to marketing in those jurisdictions. For example, our trials consist of small patient populations to date and some international regulatory filings may require larger patient populations. Obtaining foreign regulatory approvals and compliance with foreign regulatory requirements could result in significant delays, difficulties and costs for us and could delay or prevent the introduction of

our products in certain countries. If we fail to comply with the regulatory requirements in international markets and/or receive applicable marketing approvals, our target market will be reduced and our ability to realize the full market potential of our drug candidates will be harmed.

Obtaining and maintaining regulatory approval of our drug candidates in one jurisdiction does not guarantee that we will be able to obtain or maintain regulatory approval in any other jurisdiction, while a failure or delay in obtaining regulatory approval in one jurisdiction may have a negative effect on the regulatory approval process in others. For example, even if the FDA grants marketing approval of a drug candidate, comparable regulatory authorities in foreign jurisdictions must also approve the manufacturing, marketing and promotion of the drug candidate in those countries. Approval procedures vary among jurisdictions and can involve requirements and administrative review periods different from, and greater than, those in the United States, including additional nonclinical studies or clinical trials as clinical trials conducted in one jurisdiction may not be accepted by regulatory authorities in other jurisdictions. In short, the foreign regulatory approval process involves all of the risks associated with FDA approval. In many jurisdictions outside the United States, a drug candidate must be approved for reimbursement before it can be approved for sale in that jurisdiction. In some cases, the price that we may intend to charge for our products will also be subject to approval.

Laws and regulations governing any international operations we may have in the future may preclude us from developing, manufacturing and selling certain products outside of the United States and require us to develop and implement costly compliance programs.

If we expand our operations outside of the United States, we must dedicate additional resources to comply with numerous laws and regulations in each jurisdiction in which we plan to operate. The Foreign Corrupt Practices Act, or FCPA, prohibits any U.S. individual or business from paying, offering, authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with certain accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations.

Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents particular challenges in the pharmaceutical industry, because, in many countries, hospitals are operated by the government, and doctors and other hospital employees are considered foreign officials. Certain payments to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Various laws, regulations and executive orders also restrict the use and dissemination outside of the United States, or the sharing with certain non-U.S. nationals, of information classified for national security purposes, as well as certain products and technical data relating to those products. If we expand our presence outside of the United States, it will require us to dedicate additional resources to comply with these laws, and these laws may preclude us from developing, manufacturing, or selling certain products and drug candidates outside of the United States, which could limit our growth potential and increase our development costs.

The failure to comply with laws governing international business practices may result in substantial civil and criminal penalties and suspension or debarment from government contracting. The Securities and Exchange Commission, or SEC, also may suspend or bar issuers from trading securities on U.S. exchanges for violations of the FCPA's accounting provisions.

We are subject to certain U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations. We can face serious consequences for violations.

Among other matters, U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations, which are collectively referred to as Trade Laws, prohibit companies and their employees, agents, clinical research organizations, legal counsel, accountants, consultants, contractors, and other partners from authorizing, promising, offering, providing, soliciting, or receiving directly or indirectly, corrupt or improper payments or anything else of value to or from recipients in the public or private sector. Violations of Trade Laws can result in substantial criminal fines and civil penalties, imprisonment, the loss of trade privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We also expect our non-U.S. activities to increase in time. We plan to engage third parties for clinical trials and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals and we can be held liable for the corrupt or other illegal activities of our personnel, agents, or partners, even if we do not explicitly authorize or have prior knowledge of such activities.

We may seek priority review designation for one or more of our other drug candidates, but we might not receive such designation, and even if we do, such designation may not lead to a faster regulatory review or approval process.

If the FDA determines that a drug candidate offers a treatment for a serious condition and, if approved, the product would provide a significant improvement in safety or effectiveness, the FDA may designate the drug candidate for priority review. A priority review designation means that the goal for the FDA to review an application is six months, rather than the standard review period of ten months. We may request priority review for our drug candidates. The FDA has broad discretion with respect to whether or not to grant priority review status to a drug candidate, so even if we believe a particular drug candidate is eligible for such designation or status, the FDA may decide not to grant it. Moreover, a priority review designation does not necessarily result in an expedited regulatory review or approval process or necessarily confer any advantage with respect to approval compared to conventional FDA procedures. Receiving priority review from the FDA does not guarantee approval within the six-month review cycle or at all.

Breakthrough therapy designation and fast track designation by the FDA, even if granted for any of our drug candidates, may not lead to a faster development, regulatory review or approval process, and each designation does not increase the likelihood that any of our drug candidates will receive marketing approval in the United States.

We may seek a breakthrough therapy designation for some of our drug candidates. A breakthrough therapy is defined as a drug that is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For drugs that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Drugs designated as breakthrough therapies by the FDA may also be eligible for priority review and accelerated approval. Designation as a breakthrough therapy is within the discretion of the FDA. Accordingly, even if we believe one of our drug candidates meets the criteria for designation as a breakthrough therapy, the FDA may disagree and instead determine not to make such designation. In

any event, the receipt of a breakthrough therapy designation for a drug candidate may not result in a faster development process, review or approval compared to therapies considered for approval under conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of our drug candidates qualify as breakthrough therapies, the FDA may later decide that such drug candidates no longer meet the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

We may seek fast track designation for some of our drug candidates. If a drug is intended for the treatment of a serious or life-threatening condition and the drug demonstrates the potential to address unmet medical needs for this condition, the drug sponsor may apply for fast track designation. The FDA has broad discretion whether or not to grant this designation, so even if we believe a particular drug candidate is eligible for this designation, we cannot assure you that the FDA would decide to grant it. Even if we do receive fast track designation, we may not experience a faster development process, review or approval compared to conventional FDA procedures. The FDA may withdraw fast track designation if it believes that the designation is no longer supported by data from our clinical development program. Fast track designation alone does not guarantee qualification for the FDA's priority review procedures.

The FDA, the EMA and other regulatory authorities may implement additional regulations or restrictions on the development and commercialization of our drug candidates, and such changes can be difficult to predict.

The FDA, the EMA and regulatory authorities in other countries have each expressed interest in further regulating small molecule pharmaceuticals. Agencies at both the federal and state level in the United States, as well as the U.S. Congressional committees and other governments or governing agencies, have also expressed interest in further regulating the small molecule pharmaceutical industry. Such action may delay or prevent commercialization of some or all of our drug candidates. Adverse developments in clinical trials of products conducted by others may cause the FDA or other oversight bodies to change the requirements for approval of any of our drug candidates. These regulatory review agencies and committees and the new requirements or guidelines they promulgate may lengthen the regulatory review process, require us to perform additional studies or trials, increase our development costs, lead to changes in regulatory positions and interpretations, delay or prevent approval and commercialization of our drug candidates or lead to significant post-approval limitations or restrictions. As we advance our drug candidates, we will be required to consult with these regulatory agencies and comply with applicable requirements and guidelines. If we fail to do so, we may be required to delay or discontinue development of such drug candidates. These additional processes may result in a review and approval process that is longer than we otherwise would have expected. Delays as a result of an increased or lengthier regulatory approval process or further restrictions on the development of our drug candidates can be costly and could negatively impact our ability to complete clinical trials and commercialize our current and future drug candidates in a timely manner, if at all.

Healthcare legislative reform measures may have a material adverse effect on our business and results of operations.

The U.S. and many foreign jurisdictions have enacted or proposed legislative and regulatory changes affecting the healthcare system that could prevent or delay marketing approval of our current or future drug candidates or any future drug candidates, restrict or regulate post-approval activities and affect our ability to profitably sell a product for which we obtain marketing approval. Changes in regulations, statutes or the interpretation of existing regulations could impact our business in the future by requiring, for example: i) changes to our manufacturing arrangements, ii) additions or modifications to product labeling, iii) the recall or discontinuation of our products or iv) additional record-keeping requirements. If any such changes were to be imposed, they could adversely affect the operation of

our business. In the U.S., there have been and continue to be a number of legislative initiatives to contain healthcare costs. For example, in March 2010, the Affordable Care Act, or the ACA, was passed, which substantially changed the way healthcare is financed by both governmental and private insurers, and significantly impacted the U.S. pharmaceutical industry. The ACA, among other things, subjects biological products to potential competition by lower-cost biosimilars, addresses a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, increases the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extends the rebate program to individuals enrolled in Medicaid managed care organizations, establishes annual fees and taxes on manufacturers of certain branded prescription drugs, and creates a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 70% (increased pursuant to the Bipartisan Budget Act of 2018, effective as of 2019) point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D. Since then, the ACA risk adjustment program payment parameters have been updated annually.

Members of the U.S. Congress have expressed intent to pass legislation or adopt executive orders to fundamentally change or repeal parts of the ACA. While Congress has not passed repeal legislation to date, the TCJA, repealed, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." On December 14, 2018, a federal district court in Texas ruled the individual mandate is a critical and inseverable feature of the ACA, and therefore, because it was repealed as part of the TCJA, the remaining provisions of the ACA are invalid as well, and on December 18, 2019, the Fifth Circuit U.S. Court of Appeals held that the individual mandate is unconstitutional, and remanded the case to the lower court to reconsider its earlier invalidation of the full ACA. The Supreme Court of the United States granted certiorari on March 2, 2020, and heard oral arguments on the case on November 10, 2020, and the case is expected to be decided sometime in 2021. Pending review, the ACA remains in effect, but it is unclear at this time what effect the latest ruling will have on the status of the ACA. Litigation and legislation over the ACA are likely to continue, with unpredictable and uncertain results. We will continue to evaluate the effect that the ACA and its possible repeal and replacement has on our business.

Further, on January 20, 2017, an Executive Order was signed directing federal agencies with authorities and responsibilities under the ACA to waive, defer, grant exemptions from, or delay the implementation of any provision of the ACA that would impose a fiscal burden on states or a cost, fee, tax, penalty or regulatory burden on individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. On October 13, 2017, an Executive Order was signed terminating the cost-sharing subsidies that reimburse insurers under the ACA. The Trump administration has concluded that cost-sharing reduction, or CSR, payments to insurance companies required under the ACA have not received necessary appropriations from Congress and announced that it will discontinue these payments immediately until those appropriations are made. The loss of the CSR payments is expected to increase premiums on certain policies issued by qualified health plans under the ACA. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California on October 25, 2017. The loss of the cost share reduction payments is expected to increase premiums on certain policies issued by qualified health plans under the ACA. Further, on June 14, 2018, the U.S. Court of Appeals for the Federal Circuit ruled that the federal government was not required to pay to third-party payors more than $12 billion in ACA risk corridor payments that they argued were owed to them. The effects of this gap in reimbursement on third-party payors, the viability of the ACA marketplace, providers, and potentially our business, are not yet known.

Moreover, on January 22, 2018, a continuing resolution on appropriations for fiscal year 2018 was approved that delayed the implementation of certain ACA-mandated fees, including the so called “Cadillac” tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices; however on December 20, 2019, the Further Consolidated Appropriations Act (H.R. 1865) was signed into law, which repeals the Cadillac tax, the health insurance provider tax, and the medical device excise tax. It is impossible to determine whether similar taxes could be instituted in the future. The Bipartisan Budget Act of 2018, also amended the ACA, effective January 1, 2019, by increasing the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D and closing the coverage gap in most Medicare drug plans, commonly referred to as the “donut hole.” CMS published a final rule permitting further collections and payments to and from certain ACA qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. In addition, CMS has recently published a final rule that would give states greater flexibility, starting in 2020, in setting benchmarks for insurers in the individual and small group marketplaces, which may have the effect of relaxing the essential health benefits required under the ACA for plans sold through such marketplaces. Other legislative changes have been proposed and adopted in the U.S. since the ACA was enacted. In August 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation’s automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers up to 2% per fiscal year, and, due to subsequent legislative amendments, will remain in effect through 2029 unless additional Congressional action is taken. The American Taxpayer Relief Act of 2012 among other things, reduced Medicare payments to several providers, including hospitals, imaging centers and treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

There has been increasing legislative and enforcement interest in the U.S. with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries and proposed federal and state legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under Medicare, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. At the federal level, the Trump administration’s budget for fiscal years 2019 and 2020 contain further drug price control measures that could be enacted during the budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low income patients. Additionally, the Trump administration released a “Blueprint” to lower drug prices and reduce out of pocket costs of drugs that contains additional proposals to increase manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products and reduce the out of pocket costs of drug candidates paid by consumers. The U.S. Department of Health and Human Services, or HHS, has already started the process of soliciting feedback on some of these measures and, at the same time, is immediately implementing others under its existing authority. For example, in May 2019, CMS issued a final rule to allow Medicare Advantage Plans the option of using step therapy, a type of prior authorization, for Part B drugs beginning January 1, 2020. This final rule codified CMS’s policy change that was effective January 1, 2019. In addition, in September 2020, an Executive Order was issued directing the Secretary of Health and Human Services to pursue implementation of two new payment models under which Medicare would test whether paying no more than the “most-favored-nation” price for certain included drugs and biological products covered under Part B and Part D, respectively, would mitigate

poor clinical outcomes and increased Medicare expenditures associated with high drug costs. If implemented, the "most-favored-nation" price would generally reflect the lowest price, after certain adjustments, for a pharmaceutical product sold in an economically comparable member country of the Organization for Economic Co-operation and Development. Congress has also continued to conduct inquiries into the prescription drug industry's pricing practices. While several proposed reform measures will require Congress to pass legislation to become effective, Congress has indicated that it will continue to seek new legislative and/or regulatory measures to address prescription drug costs. At the state level, legislatures are increasingly passing legislation and states are implementing regulations designed to control spending on, and patient out-of-pocket costs for, drug products. Implementation of cost containment measures or other healthcare reforms that affect the pricing and/or availability of drug products may impact our ability to generate revenue, attain or maintain profitability, or commercialize products for which we may receive regulatory approval in the future.

Further, on May 30, 2018, the Right to Try Act, was signed into law. The law, among other things, provides a federal framework for certain patients to access certain investigational new drug candidates that have completed a Phase 1 clinical trial and that are undergoing investigation for FDA approval. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA permission under the FDA expanded access program. There is no obligation for a pharmaceutical manufacturer to make its drug candidates available to eligible patients as a result of the Right to Try Act.

At the state level, individual states are increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional health care authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other health care programs. These measures could reduce the ultimate demand for our products, once approved, or put pressure on our product pricing.

We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our current or future drug candidates or additional pricing pressures.

Our revenue prospects could be affected by changes in healthcare spending and policy in the U.S. and abroad.

We operate in a highly regulated industry and new laws, regulations or judicial decisions, or new interpretations of existing laws, regulations or decisions, related to healthcare availability, the method of delivery or payment for healthcare products and services could negatively impact our business, operations and financial condition.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal, and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare. We cannot predict the initiatives that may be adopted in the future, including repeal, replacement, or significant revisions to the ACA. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare and/or impose price controls may adversely affect:

- the demand for our current or future drug candidates, if we obtain regulatory approval;

- our ability to set a price that we believe is fair for our products;
- our ability to obtain coverage and reimbursement approval for a product;
- our ability to generate revenue and achieve or maintain profitability;
- the level of taxes that we are required to pay; and
- the availability of capital.

Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors, which may adversely affect our results of operations and future profitability.

Our relationships with healthcare providers, other customers, and third-party payors will be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, exclusion from government healthcare programs, contractual damages, reputational harm and diminished profits and future earnings.

Although we do not currently have any products on the market, once we begin commercializing our drug candidates, we will be subject to additional healthcare statutory and regulatory requirements and enforcement by the federal government and the states and foreign governments in which we conduct our business. Healthcare providers, physicians and third-party payors play a primary role in the recommendation and prescription of any drug candidates for which we obtain marketing approval. Our future arrangements with third-party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we market, sell and distribute our drug candidates for which we obtain marketing approval. Restrictions under applicable federal and state healthcare laws and regulations include the following:

- the federal Anti-Kickback Statute prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under federal and state healthcare programs such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- the federal civil and criminal false claims and civil monetary penalties laws, including the federal False Claims Act, or FCA, imposes criminal and civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government. In addition, the government may assert that a claim including items and services resulting from a violation of the federal Anti-Kickback Statute constitutes a false of fraudulent claim for purposes of the False Claims Act;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services; similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;

- the federal physician payment transparency provisions, sometimes referred to as the “Sunshine Act” under the Affordable Care Act, require manufacturers of drugs, devices, biologics and medical supplies that are reimbursable under Medicare, Medicaid, or the Children’s Health Insurance Program to report to the Department of Health and Human Services information related to transfers of value made to licensed physicians (currently defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests of such physicians and their immediate family members. Effective January 1, 2022, these reporting obligations will extend to include transfers of value made to certain non-physician providers such as physician assistants and nurse practitioners;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 and its implementing regulations, imposes obligations on certain covered entity healthcare providers, health plans, and healthcare clearinghouses as well as their business associates that perform certain services involving the use or disclosure of individually identifiable health information, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information; and
- analogous state laws and regulations, such as state anti-kickback and false claims laws may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers. Some state laws require pharmaceutical companies to comply with the pharmaceutical industry’s voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other health care providers or marketing expenditures. Further, many state laws governing the privacy and security of health information in certain circumstances, differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our future business arrangements with third parties comply with applicable healthcare laws and regulations could involve substantial costs and may require us to undertake or implement additional policies or measures. We may face claims and proceedings by private parties, and claims, investigations and other proceedings by governmental authorities, relating to allegations that our business practices do not comply with current or future statutes, regulations or case law involving applicable fraud and abuse, privacy or data protection, or other healthcare laws and regulations, and it is possible that courts or governmental authorities may conclude that we have not complied with them, or that we may find it necessary or appropriate to settle any such claims or other proceedings. In connection with any such claims, proceedings, or settlements, we may be subject to significant civil, criminal and administrative penalties, damages, fines, other damages, imprisonment, exclusion from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other providers or entities with whom we expect to do business is found not to be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

Compliance with global privacy and data security requirements could result in additional costs and liabilities to us or inhibit our ability to collect and process data globally, and the failure to comply with such requirements could subject us to significant fines and penalties, which may have a material adverse effect on our business, financial condition, or results of operations.

The regulatory framework for the collection, use, safeguarding, sharing, transfer, and other processing of information worldwide is rapidly evolving and is likely to remain uncertain for the foreseeable future. Globally, virtually every jurisdiction in which we operate has established its own

data security and privacy frameworks with which we must comply. For example, the collection, use, disclosure, transfer, or other processing of personal data regarding individuals in the European Union, including personal health data and employee data, is subject to the European Union General Data Protection Regulation, or the GDPR, which took effect across all member states of the European Economic Area, or EEA, in May 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 informs our obligations with respect to any clinical trials conducted in the EEA by expanding the definition of personal data to include coded data and requiring changes to informed consent practices and more detailed notices for clinical trial subjects and investigators. In addition, the GDPR imposes strict rules on the transfer of personal data to countries outside the European Union, including the United States and, as a result, increases the scrutiny that such rules should apply to transfers of personal data from any clinical trial sites located in the EEA to the United States. The GDPR also permits data protection authorities to require destruction of improperly gathered or used personal information and/or impose substantial fines for violations of the GDPR, which can be up to four percent of global revenues or 20 million Euros, whichever is greater, and 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. In addition, the GDPR provides that European Union member states may make their own further laws and regulations limiting the processing of personal data, including genetic, biometric, or health data.

Given the breadth and depth of its obligations, complying with the GDPR's requirements is rigorous and time intensive and requires significant resources and assessment of our technologies, systems and practices, as well as those of any third-party collaborators, service providers, contractors, or consultants that process or transfer personal data collected in the European Union.

Further, the United Kingdom exited the EU effective January 31, 2020, subject to a transition period that ended December 31, 2020. Brexit and ongoing developments in the United Kingdom have created uncertainty with regard to the regulation of data protection in the United Kingdom and could result in the application of new data privacy and protection laws and standards to our operations in the United Kingdom and our handling of personal data of individuals located in the United Kingdom. The United Kingdom has implemented legislation that substantially implements the GDPR, and the European Commission and the United Kingdom government announced a EU-UK Trade and Cooperation Agreement on December 24, 2020, providing for a temporary free flow of personal data between the EU and the United Kingdom, but it remains to be seen how the United Kingdom's withdrawal from the EU will impact the manner in which United Kingdom data protection laws or regulations will develop and how data transfers to and from the United Kingdom will be regulated and enforced by the UK Information Commissioner's Office, EU data protection authorities, or other regulatory bodies in the longer term.

In the United States, a broad variety of laws and regulations relating to privacy and data security may be applicable to our activities. New laws also are being considered at both the state and federal levels, and state legislatures such as California have already passed and enacted privacy legislation. For example, the California Consumer Privacy Act, or CCPA, which became effective on January 1, 2020, creates individual privacy rights for California consumers and increases the privacy and security obligations of entities handling certain personal data. The CCPA, among other things, requires covered companies to provide new disclosures to California consumers, and afford such consumers new abilities to opt out of certain sales of personal information, access and require deletion of their personal information, and receive detailed information about how their personal information is used. The CCPA

has been amended on multiple occasions and additional regulations of the California Attorney General came into effect on August 14, 2020. However, aspects of the CCPA and its interpretation remain unclear. The effects of the CCPA are significant and may require us to modify our data processing practices and policies and to incur substantial costs and expenses in an effort to comply. Failure to comply with the CCPA may result in attorney general enforcement action and damage to our reputation. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation. Moreover, a ballot initiative from privacy rights advocates intended to augment and expand the CCPA called the California Privacy Rights Act, or CPRA, was approved by California voters in the November 2020 election. The CPRA imposes additional obligations relating to consumer data on companies doing business in California beginning January 1, 2022, with implementing regulations expected on or before July 1, 2022, and enforcement beginning July 1, 2023. The CPRA significantly modifies the CCPA, including by expanding consumers' rights with respect to certain sensitive personal information, potentially resulting in further uncertainty and requiring us to incur additional costs and expenses in an effort to comply, as we may need to modify or augment our existing practices. The CPRA also creates a new state agency that will be vested with authority to implement and enforce the CCPA and the CPRA. New legislation proposed or enacted in a number of states impose, or have the potential to impose additional obligations on companies that collect, store, use, retain, disclose, transfer and otherwise process confidential, sensitive and personal information, and will continue to shape the data privacy environment nationally. State laws are changing rapidly and there is discussion in Congress of a new federal data protection and privacy law to which we would become subject if it is enacted. In addition, all 50 states have laws including obligations to provide notification of security breaches of computer databases that contain personal information to affected individuals, state officers and others.

The myriad international and U.S. privacy and data breach laws are not consistent, and compliance in the event of a widespread data breach is difficult and may be costly. Moreover, states have been frequently amending existing laws, requiring attention to changing regulatory requirements. In addition to government regulation, privacy advocates and industry groups have and may in the future propose self-regulatory standards from time to time. These and other industry standards may legally or contractually apply to us, or we may elect to comply with such standards. We expect that there will continue to be new proposed laws and regulations concerning data privacy and security, and we cannot yet determine the impact such future laws, regulations and standards may have on our business. With the GDPR, CCPA, CPRA, and other laws, regulations and other obligations relating to privacy and data protection imposing new and relatively burdensome obligations, and with substantial uncertainty over the interpretation and application of these and other obligations, we may face challenges in addressing their requirements, putting in place additional compliance mechanisms and making necessary changes to our policies and practices, and may incur significant costs and expenses in an effort to do so.

We make public statements about our use and disclosure of personal information through our privacy policy, information provided on our website and press statements. Although we endeavor to comply with our public statements and documentation, we may at times fail to do so or be alleged to have failed to do so. We may be subject to potential government or legal action if such policies or statements are found to be deceptive, unfair or misrepresentative of our actual practices. In addition, from time to time, concerns may be expressed about whether our technology compromises the privacy of our customers and others. While we believe that we comply with industry standards and applicable laws and industry codes of conduct relating to privacy and data protection in all material respects, there is no assurance that we will not be subject to claims that we have violated applicable laws or codes of conduct, that we will be able to successfully defend against such claims or that we will not be subject to significant fines and penalties in the event of non-compliance. Additionally, to the extent multiple state-level laws are introduced with inconsistent or conflicting standards and there is no federal law to preempt such laws, compliance with such laws could be difficult to achieve and we could be subject to

fines and penalties in the event of non-compliance. Furthermore, enforcement actions and investigations by regulatory authorities related to data security incidents and privacy violations continue to increase.

In addition, if third parties we work with, such as vendors or service providers, violate applicable laws or regulations or our policies, such violations may also put our data at risk and could in turn have an adverse effect on our business. Any failure or perceived failure by us or our service providers to comply with our applicable policies or notices relating to privacy or data protection, our contractual or other obligations to third parties, or any of our other legal obligations relating to privacy or data protection, may result in governmental investigations or enforcement actions, litigation, claims and other proceedings, and could result in significant fines, penalties, and other liability. Additionally, defending against any claims, litigation, regulatory proceedings, or other proceedings can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions or proceedings that may be brought against us, our business may be impaired, and we may suffer reputational and other harm.

Our employees, independent contractors, consultants, and vendors may engage in misconduct or other improper activities, including non-compliance with regulatory standards and requirements and insider trading laws, which could cause significant liability for us and harm our reputation.

We are exposed to the risk of fraud or other misconduct by our employees, independent contractors, consultants, and vendors. Misconduct by these partners could include intentional failures to comply with FDA regulations or similar regulations of comparable foreign regulatory authorities, provide accurate information to the FDA or comparable foreign regulatory authorities, comply with manufacturing standards, comply with federal and state healthcare fraud and abuse laws and regulations and similar laws and regulations established and enforced by comparable foreign regulatory authorities, report financial information or data accurately, or disclose unauthorized activities to us. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. This could include violations of HIPAA, other U.S. federal and state law, and requirements of non-U.S. jurisdictions, including the European Union Data Protection Directive. We are also exposed to risks in connection with any insider trading violations by employees or others affiliated with us. It is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws, standards, regulations, guidance, or codes of conduct. Furthermore, our employees may, from time to time, bring lawsuits against us for employment issues, including injury, discrimination, wage and hour disputes, sexual harassment, hostile work environment, or other employment issues. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and results of operations, including the imposition of significant fines or other sanctions.

Risks Relating to Employee Matters and Managing Growth

Our future success depends on our ability to retain key executives and experienced scientists and to attract, retain and motivate qualified personnel.

We are highly dependent on the research and development, clinical and business development expertise of Christopher Gibson, our Chief Executive Officer, Tina Marriott Larson, our Chief Operating Officer and President, Michael Secora, our Chief Financial Officer, Shafique Virani, our Chief Corporate Development Officer, and Ramona Doyle, our Chief Medical Officer, as well as the other

principal members of our management, scientific, technological and clinical team. Although we have entered into employment letter agreements with our executive officers, each of them may terminate their employment with us at any time or not be able to perform the services we need in the future. We do not maintain “key person” insurance for any of our executives or other employees. In addition, we rely on our employees to help operate and repair our robots and consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us. If we are unable to continue to attract and retain high quality personnel, our ability to pursue our growth strategy will be limited.

Recruiting and retaining qualified scientific, clinical, manufacturing and sales and marketing personnel will also be critical to our success. The loss of the services of our executive officers or other key employees, including temporary loss due to illness, could impede the achievement of our research, development and commercialization objectives and seriously harm our ability to successfully implement our business strategy. Furthermore, replacing executive officers and key employees may be difficult and may take an extended period of time because of the limited number of individuals in our industry with the breadth of skills and experience required to successfully develop, gain regulatory approval of, and commercialize products. Competition to hire from this limited pool is intense, and we may be unable to hire, train, retain or motivate these key personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. Failure to succeed in clinical trials may make it more challenging to recruit and retain qualified scientific personnel.

Our presence in Salt Lake City, where we are headquartered, may limit our ability to hire talent. Some of the employees we may want to hire in the future will reside in the greater San Francisco, New York, San Diego or Boston metro areas and may not want to relocate to Salt Lake City. Many of the other pharmaceutical companies that we compete against for qualified personnel have greater financial and other resources, different risk profiles and a longer history in the industry than we do. They also may provide more diverse opportunities and better chances for career advancement. Some of these characteristics may be more appealing to high-quality candidates than what we have to offer. If we are unable to continue to attract and retain high-quality personnel, the rate and success with which we can discover and develop drug candidates and our business will be limited.

Our employees, key opinion leaders, or KOLs, CROs and consultants may engage in misconduct or other improper activities, including non-compliance with regulatory standards and requirements and insider trading.

We are exposed to the risk that our employees, KOLs, CROs and consultants may engage in fraudulent conduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violate the regulations of the FDA and other regulatory authorities, including those laws requiring the reporting of true, complete and accurate information to such authorities; healthcare fraud and abuse laws and regulations in the United States and abroad; or laws that require the reporting of financial information or data accurately. In particular, sales, marketing, and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self-dealing, and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Activities subject to these laws also involve the improper use of information obtained in the course of clinical trials or creating fraudulent data in our preclinical studies or clinical trials, which could result in regulatory sanctions and cause serious harm to

our reputation. We intend to adopt, prior to the completion of this offering, a code of conduct applicable to all of our employees, but it is not always possible to identify and deter misconduct by employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. Additionally, we are subject to the risk that a person could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

We expect to expand our development and regulatory capabilities and potentially implement sales, marketing, and distribution capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

As of January 14, 2021, we had 209 full-time employees. We expect to experience significant growth in the number of our employees and the scope of our operations, particularly as we function as a public company and in the areas of product development, regulatory affairs and, if any of our drug candidates receives marketing approval, sales, marketing and distribution. To manage our anticipated future growth, we must continue to implement and improve our managerial, operational, and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. The expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

We may acquire additional businesses or products, form strategic alliances, or create joint ventures with third parties that we believe will complement or augment our existing business. If we acquire businesses with promising markets or technologies, we may not be able to realize the benefit of acquiring such businesses if we are unable to successfully integrate them with our existing operations and company culture. We may encounter numerous difficulties in developing, manufacturing, and marketing any new products resulting from a strategic alliance or acquisition that delay or prevent us from realizing their expected benefits or enhancing our business. We cannot assure you that, following any such acquisition, we will achieve the expected synergies to justify the transaction.

Product liability lawsuits against us could cause us to incur substantial liabilities and could limit commercialization of any drug candidates that we may develop.

We face an inherent risk of product liability exposure related to the testing of drug candidates in human clinical trials and will face an even greater risk if we commercially sell any medicines that we may develop. If we cannot successfully defend ourselves against claims that our drug candidates or medicines caused injuries, we could incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any drug candidates or therapeutics that we may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;

- significant costs to defend the related litigation;
- substantial monetary awards to trial participants or patients;
- loss of revenue; and
- the inability to commercialize our drug candidates.

Although we maintain product liability insurance, including coverage for clinical trials that we sponsor, it may not be adequate to cover all liabilities that we may incur. We anticipate that we will need to increase our insurance coverage as we commence additional clinical trials and if we successfully commercialize any drug candidates. The market for insurance coverage is increasingly expensive, and the costs of insurance coverage will increase as our clinical programs increase in size. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise.

Risks Related to Our Common Stock and This Offering

We are an "emerging growth company" as defined in the JOBS Act and will be able to avail ourselves of reduced disclosure requirements applicable to emerging growth companies, which could make our common stock less attractive to investors and adversely affect the market price of our common stock.

We are an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. We will remain an emerging growth company until the earlier of i) the last day of the fiscal year in which we have total annual gross revenues of $1.07 billion or more; ii) the last day of the fiscal year following the fifth anniversary of the date of the completion of this offering; iii) the date on which we have issued more than $1 billion in nonconvertible debt during the previous three years; or iv) the date on which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission, which means the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30th. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, or Section 404;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;
- providing only two years of audited financial statements in addition to any required unaudited interim financial statements and a correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved. In this prospectus, we have not included all of the executive compensation-related information that would be required if we were not an emerging growth company.

We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of reduced reporting burdens in this prospectus. In particular, we have provided only two years of audited financial statements and have not included all of the executive compensation

information that would be required if we were not an emerging growth company. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have elected to use the extended transition period for new or revised accounting standards during the period in which we remain an emerging growth company; however, we may adopt certain new or revised accounting standards early.

Although we are still evaluating the JOBS Act, we currently intend to take advantage of some, but not all, of the reduced regulatory and reporting requirements that will be available to us so long as we qualify as an "emerging growth company." We have elected to avail ourselves of this exemption and, therefore, we are not subject to the same new or revised accounting standards as other public companies that are not emerging growth companies. As a result, changes in rules of U.S. generally accepted accounting principles or their interpretation, the adoption of new guidance or the application of existing guidance to changes in our business could significantly affect our financial position and results of operations. In addition, our independent registered public accounting firm will not be required to provide an attestation report on the effectiveness of our internal control over financial reporting so long as we qualify as an "emerging growth company," which may increase the risk that material weaknesses or significant deficiencies in our internal control over financial reporting go undetected. Likewise, so long as we qualify as an "emerging growth company," we may elect not to provide you with certain information, including certain financial information and certain information regarding compensation of our executive officers, that we would otherwise have been required to provide in filings we make with the SEC, which may make it more difficult for investors and securities analysts to evaluate our company. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock, and our stock price may be more volatile and may decline.

The price of our common stock may be volatile and fluctuate substantially, which could result in substantial losses for purchasers of our common stock in this offering.

Our stock price is likely to be volatile. The stock market in general and the market for biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, you may not be able to sell your common stock at or above the initial public offering price. The market price for our common stock may be influenced by many factors, including:

- the success of competitive products or technologies;
- results of clinical trials of our drug candidates or those of our competitors;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to any of our drug candidates or clinical development programs;
- the results of our efforts to discover, develop, acquire or in-license additional drug candidates or products;

- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry and market conditions; and
- the other factors described in this “Risk Factors” section.

Sales of a substantial number of shares of our common stock in the public market could cause our stock price to fall.

If our existing stockholders sell, or indicate an intention to sell, substantial amounts of our common stock in the public market after the lock-up and other legal restrictions on resale discussed in this prospectus lapse, the market price of our common stock could decline. Based upon the number of shares of common stock, on an as-converted basis, outstanding as of December 31, 2020, upon the completion of this offering, we will have outstanding a total of shares of common stock, including shares of non-vested restricted common stock, and assuming no exercise of the underwriters’ option to purchase additional shares. Of these shares, as of the date of this prospectus, approximately shares of our common stock, plus any shares sold upon exercise of the underwriters’ option to purchase additional shares, will be freely tradable, without restriction, in the public market immediately following this offering, assuming that current stockholders do not purchase shares in this offering. The representatives of the underwriters, however, may, in their sole discretion, permit our officers, directors and other stockholders who are subject to these lock-up agreements to sell shares prior to the expiration of the lock-up agreements.

The lock-up agreements pertaining to this offering will expire 180 days from the date of this prospectus. After the lock-up agreements expire, based upon the number of shares of common stock, on an as-converted basis, outstanding as of December 31, 2020, up to an additional shares of common stock will be eligible for sale in the public market, % of which shares are held by directors, executive officers and other affiliates and will be subject to certain limitations of Rule 144 under the Securities Act of 1933, as amended, or the Securities Act.

Upon completion of this offering, shares of common stock that are either subject to outstanding options or reserved for future issuance under our equity incentive plans will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules, the lock-up agreements and Rule 144 and Rule 701 under the Securities Act. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the market price of our common stock could decline.

After this offering, the holders of approximately shares of our common stock will be entitled to rights with respect to the registration of their shares under the Securities Act, subject to the lock-up agreements described above. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares purchased by affiliates. Any sales of securities by these stockholders could have a material adverse effect on the market for our common stock.

An active trading market for our common stock may not develop, and you may not be able to resell your shares at or above the initial public offering price.

Prior to this offering, there has been no public market for shares of our common stock. While our common stock has been approved for listing on the Nasdaq Stock Market, an active trading market for

our shares may never develop or be sustained following this offering. The initial public offering price of our common stock will be determined through negotiations between us and the underwriters. This initial public offering price may not be indicative of the market price of our common stock after this offering. In the absence of an active trading market for our common stock, investors may not be able to sell their common stock at or above the initial public offering price or at the time that they would like to sell.

Our executive officers, directors, principal stockholders, and their affiliates will continue to exercise significant control over our company after this offering, which will limit your ability to influence corporate matters and could delay or prevent a change in corporate control.

Immediately following the completion of this offering, and disregarding any shares of common stock that they purchase in this offering, the existing holdings of our executive officers, directors, principal stockholders and their affiliates, will represent beneficial ownership, in the aggregate, of approximately % of our outstanding common stock, assuming no exercise of the underwriters' option to acquire additional common stock in this offering and assuming we issue the number of shares of common stock as set forth on the cover page of this prospectus. As a result, these stockholders, if they act together, will be able to influence our management and affairs and control the outcome of matters submitted to our stockholders for approval, including the election of directors and any sale, merger, consolidation, or sale of all or substantially all of our assets. These stockholders acquired their shares of common stock for substantially less than the price of the shares of common stock being acquired in this offering, and these stockholders may have interests, with respect to their common stock, that are different from those of investors in this offering and the concentration of voting power among these stockholders may have an adverse effect on the price of our common stock. In addition, this concentration of ownership might adversely affect the market price of our common stock by:

- delaying, deferring, or preventing a change of control of us;
- impeding a merger, consolidation, takeover or other business combination involving us; or
- discouraging a potential acquirer from making a tender offer or otherwise attempting to obtain control of us.

See "Principal Stockholders" in this prospectus for more information regarding the ownership of our outstanding common stock by our executive officers, directors, principal stockholders, and their affiliates.

If you purchase our common stock in this offering, you will incur immediate and substantial dilution in the book value of your shares.

You will suffer immediate and substantial dilution in the net tangible book value of the common stock you purchase in this offering. Assuming an initial public offering price of $ per share, the midpoint of the price range set forth on the cover page of this prospectus, purchasers of common stock in this offering will experience immediate dilution of $ per share in net tangible book value of the common stock. In addition, investors purchasing common stock in this offering will contribute % of the total amount invested by stockholders since inception but will only own % of the shares of common stock outstanding. In the past, we issued options and other securities to acquire common stock at prices significantly below the initial public offering price. To the extent these outstanding securities are ultimately exercised, investors purchasing common stock in this offering will sustain further dilution. See "Dilution" for a more detailed description of the dilution to new investors in the offering.

We have broad discretion in how we use the proceeds of this offering and may not use these proceeds effectively, which could affect our results of operations and cause our stock price to decline.

We will have considerable discretion in the application of the net proceeds of this offering. We intend to use the net proceeds from this offering to fund our drug discovery platform, pursue strategic collaborations and advance or drug candidates through clinical development efforts. We also intend to use the proceeds of this offering to expand our infrastructure and facilities to support our development efforts, to fund new and ongoing research activities and new drug candidates and for working capital and other general corporate purposes, which may include funding for the hiring of additional personnel, capital expenditures and the costs of operating as a public company. Investors will be relying upon management's judgment with only limited information about our specific intentions for the use of the balance of the net proceeds of this offering. We may use the net proceeds for purposes that do not yield a significant return or any return at all for our stockholders. In addition, pending their use, we may invest the net proceeds from this offering in a manner that does not produce income or that loses value.

Because we do not anticipate paying any cash dividends on our capital stock in the foreseeable future, capital appreciation, if any, will be your sole source of gain.

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. In addition, the terms of any existing or future debt agreements may preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

We will incur increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives.

As a public company, and particularly after we are no longer an "emerging growth company," we will incur significant legal, accounting, and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act of 2002 and rules subsequently implemented by the Securities and Exchange Commission and the Nasdaq Stock Market have imposed various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, we expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance.

Pursuant to Section 404, we will be required to furnish a report by our management on our internal control over financial reporting, including an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. However, while we remain an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. To achieve compliance with Section 404 within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that neither we nor our independent registered public accounting firm will be able to conclude within the

prescribed timeframe that our internal control over financial reporting is effective as required by Section 404. This could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements. In addition, if we are not able to continue to meet these requirements, we may not be able to remain listed on the Nasdaq Stock Market.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws and Delaware law might discourage, delay, or prevent a change in control of our company or changes in our management and, therefore, depress the market price of our common stock.

Our amended and restated certificate of incorporation and amended and restated bylaws, as they will be in effect upon closing of this offering, will contain provisions that could depress the market price of our common stock by acting to discourage, delay or prevent a change in control of our company or changes in our management that the stockholders of our company may deem advantageous. These provisions, among other things:

- establish a classified board of directors so that not all members of our board are elected at one time;
- permit only the board of directors to establish the number of directors and fill vacancies on the board;
- authorize the issuance of "blank check" preferred stock that our board could use to implement a stockholder rights plan (also known as a "poison pill");
- eliminate the ability of our stockholders to call special meetings of stockholders;
- prohibit stockholder action by written consent, which requires all stockholder actions to be taken at a meeting of our stockholders;
- prohibit cumulative voting;
- authorize our board of directors to amend the bylaws;
- establish advance notice requirements for nominations for election to our board or for proposing matters that can be acted upon by stockholders at annual stockholder meetings; and
- require a super-majority vote of stockholders to amend some provisions described above.

In addition, Section 203 of the General Corporation Law of the State of Delaware, or DGCL, prohibits a publicly-held Delaware corporation from engaging in a business combination with an interested stockholder, generally a person which together with its affiliates owns, or within the last three years has owned, 15% of our voting stock, for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner.

Any provision of our amended and restated certificate of incorporation, amended and restated bylaws or Delaware law that has the effect of delaying or preventing a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our capital stock and could also affect the price that some investors are willing to pay for our common stock.

Our amended and restated bylaws that will become effective upon the closing of this offering provide that the Court of Chancery of the State of Delaware and the federal district courts of the United States of America will be the exclusive forums for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated bylaws that will become effective upon the closing of this offering provide that the Court of Chancery of the State of Delaware or, if the Court of Chancery does not have

jurisdiction, another State court in Delaware or the federal district court for the District of Delaware, is the exclusive forum for the following, except for any claim as to which such court determines that there is an indispensable party not subject to the jurisdiction of such court, and the indispensable party does not consent to the personal jurisdiction of such court within 10 days following such determination, which is vested in the exclusive jurisdiction of a court or forum other than such court or for which such court does not have subject matter jurisdiction:

- any derivative action or proceeding brought on our behalf;
- any action asserting a claim of breach of fiduciary duty;
- any action asserting a claim against us arising under the DGCL, our amended- and restated certificate of incorporation or our amended and restated bylaws; and
- any action asserting a claim against us that is governed by the internal-affairs doctrine.

This provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act or any other claim for which the U.S. federal courts have exclusive jurisdiction. Our amended and restated bylaws further provide that the federal district courts of the United States of America will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act.

These exclusive-forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage lawsuits against us and our directors, officers and other employees. Any person or entity purchasing or otherwise acquiring any interest in any of our securities shall be deemed to have notice of and consented to these provisions. There is uncertainty as to whether a court would enforce such provisions, and the enforceability of similar choice of forum provisions in other companies' charter documents has been challenged in legal proceedings. It is possible that a court could find these types of provisions to be inapplicable or unenforceable, and if a court were to find either exclusive-forum provision in our amended and restated bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving the dispute in other jurisdictions, which could seriously harm our business.

If securities analysts do not publish research or reports about our business or if they publish negative evaluations of our stock, the price of our stock 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. We may never obtain research coverage by industry or financial analysts. If no or few analysts commence coverage of us, the trading price of our stock would likely decrease. Even if we do obtain analyst coverage, if one or more of the analysts covering our business downgrade their evaluations of our stock, the price of our stock could decline. If one or more of these analysts cease to cover our stock, we could lose visibility in the market for our stock, which in turn could cause our stock price to decline.

We may be subject to securities litigation, which is expensive and could divert management attention.

The market price of our common stock may be volatile. The stock market in general, and the Nasdaq Stock Market and biotechnology companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. In the past, companies that have experienced volatility in the market price of their stock have been subject to securities class action litigation. We may be the target of this type of litigation in the future. Securities litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could seriously harm our business.

Our actual operating results may differ significantly from any guidance that we provide.

From time to time, we may provide guidance in our quarterly earnings conference calls, quarterly earnings releases, or otherwise, regarding our future performance that represents our management's estimates as of the date of release. This guidance, which would include forward-looking statements, would be based on projections prepared by our management. Neither our registered public accountants nor any other independent expert or outside party would compile or examine the projections. Accordingly, no such person would express any opinion or any other form of assurance with respect to the projections.

Projections are based upon a number of assumptions and estimates that, while presented with numerical specificity, are inherently subject to significant business, economic, and competitive uncertainties and contingencies, many of which are beyond our control and are based upon specific assumptions with respect to future business decisions, some of which will change. The principal reason that we would release guidance is to provide a basis for our management to discuss our business outlook with analysts and investors. We do not accept any responsibility for any projections or reports published by any such third parties.

Guidance is necessarily speculative in nature, and it can be expected that some or all of the assumptions underlying any guidance furnished by us will not materialize or will vary significantly from actual results. Accordingly, our guidance would be only an estimate of what management believes is realizable as of the date of release. Actual results may vary from our guidance and the variations may be material.

As a result of becoming a public company, we will be obligated to develop and maintain proper and effective internal controls over financial reporting. Any failure to maintain the adequacy of these internal controls may adversely affect investor confidence in our company and, as a result, the value of our common stock.

Our chief financial officer has not been the chief financial officer of a publicly traded company and our chief executive officer has not been the chief executive officer of a publicly traded company. Neither has been involved in the transition of a private company to a public company through an initial public offering. Pursuant to Section 404 of the Sarbanes-Oxley Act, we will be required to furnish a report by our management on our internal control over financial reporting beginning with our second filing of an Annual Report on Form 10-K with the SEC after we become a public company. This assessment will need to include disclosure of any material weaknesses identified by our management in our internal control over financial reporting. However, our independent registered public accounting firm will not be required to attest to the effectiveness of our internal control over financial reporting until our first annual report required to be filed with the SEC following the date we are no longer an emerging growth company. At such time as we are required to obtain auditor attestation, if we then have a material weakness, we would receive an adverse opinion regarding our internal control over financial reporting from our independent registered accounting firm.

To achieve compliance with Section 404 within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, including through hiring additional financial and accounting personnel, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are functioning as documented, and implement a continuous reporting and improvement process for internal control over financial reporting. During our evaluation of our internal control, if we identify one or more material weaknesses in our internal control over financial reporting, we will be unable to assert

that our internal control over financial reporting is effective. We cannot assure you that there will not be material weaknesses or significant deficiencies in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition, or results of operations. If we are unable to conclude that our internal control over financial reporting is effective, or if our independent registered public accounting firm determines we have a material weakness or significant deficiency in our internal control over financial reporting, we could lose investor confidence in the accuracy and completeness of our financial reports, the market price of shares of our common stock could decline, and we could be subject to sanctions or investigations by the Nasdaq Stock Market, the SEC, or other regulatory authorities. Failure to remedy any material weakness in our internal control over financial reporting, or to implement or maintain other effective control systems required of public companies, could also restrict our future access to the capital markets.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements that are based on our management's beliefs and assumptions and on information currently available to our management. The forward-looking statements are contained principally in the sections captioned "Prospectus Summary," "Risk Factors," "Management's Discussion and Analysis of Financial Condition and Results of Operations," "Industry Overview," and "Business." All statements other than statements of historical facts contained in this prospectus, including statements regarding our future results of operations and financial position, business strategy, development plans, planned preclinical studies, and clinical trials, future results of clinical trials, expected research and development costs, regulatory strategy, timing, and likelihood of success, as well as plans and objectives of management for future operations, are forward-looking statements. In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "would," "expect," "plan," "anticipate," "could," "intend," "target," "project," "contemplate," "believe," "estimate," "predict," "potential," or "continue" or the negative of these terms or other similar expressions. Forward-looking statements contained in this prospectus include, but are not limited to, statements about:

- the initiation, timing, progress, results, and cost of our research and development programs and our current and future preclinical and clinical studies, including statements regarding design of, and the timing of initiation and completion of, studies or trials and related preparatory work, the period during which the results of the trials will become available, and our research and development programs;
- the ability of our clinical trials to demonstrate safety and efficacy of our drug candidates, and other positive results;
- the ability and willingness of our third-party strategic collaborators to continue research and development activities relating to our development candidates and investigational medicines;
- future agreements with third parties in connection with the commercialization of our investigational medicines and any other approved product;
- the timing, scope, and likelihood of regulatory filings and approvals, including timing of Investigational New Drug applications and final approval by the U.S. Food and Drug Administration, or FDA, of our current drug candidates and any other future drug candidates, including our ability to maintain any such approvals;
- the timing, scope, or likelihood of foreign regulatory filings and approvals, including our ability to maintain any such approvals;
- the size of the market opportunity for our drug candidates, including our estimates of the number of patients who suffer from the diseases we are targeting;
- our ability to identify viable new drug candidates for clinical development and the accelerating rate at which we expect to identify such candidates, whether through an inferential approach or otherwise;
- our expectation that the assets that will drive the most value for us are those that we will identify in the future using our datasets and tools;
- our ability to develop and advance our current drug candidates and programs into, and successfully complete, clinical studies;
- our ability to reduce the time or cost or increase the likelihood of success of our research and development relative to the traditional drug discovery paradigm;
- our ability to improve, and the rate of improvement in, our infrastructure, datasets, biology, and technology tools, and drug discovery platform, or to realize benefits from such improvements;

- our expectations related to the performance and benefits of our BioHive-1 supercomputer;
- our ability to realize a return on our investment of resources and cash in our drug discovery collaborations;
- our ability to scale like a technology company and to add more programs to our pipeline each year than in the prior;
- our ability to successfully compete in a highly competitive market;
- our manufacturing, commercialization, and marketing capabilities and strategy;
- our plans relating to commercializing our drug candidates, if approved, including the geographic areas of focus and sales strategy;
- our expectations regarding the approval and use of our drug candidates in combination with other drugs;
- the rate and degree of market acceptance and clinical utility of our current drug candidates and other drug candidates we may develop;
- our competitive position and the success of competing therapies that are or may become available;
- our estimates of the number of patients that we will enroll in our clinical trials and the timing of their enrollment;
- the beneficial characteristics, safety, efficacy, and therapeutic effects of our drug candidates;
- our plans relating to the further development of our drug candidates, including additional indications we may pursue;
- existing regulations and regulatory developments in the United States, Europe, and other jurisdictions;
- our ability to adequately protect and enforce our intellectual property and proprietary technology, including the scope of protection we are able to establish and maintain for intellectual property rights covering our current drug candidates and other drug candidates we may develop, obtaining patent protection, the extensions of existing patent terms where available, the validity of intellectual property rights held by third parties, the protection of our trade secrets, and our ability not to infringe, misappropriate or otherwise violate any third-party intellectual property rights;
- the impact of any current or future intellectual property litigation and our ability to defend against claims of infringement, misappropriation, or other violations of any third-party intellectual property rights;
- our ability to keep pace with new technological developments;
- our ability to utilize third-party open source software and cloud-based infrastructure, on which we are dependent;
- the adequacy of our insurance policies and the scope of their coverage;
- the potential impact of a pandemic, epidemic, or outbreak of an infectious disease, such as COVID-19, or natural disaster, and the effect of such outbreak or natural disaster on our business and financial results;
- our ability to maintain our technical operations infrastructure to avoid errors, delays, or cybersecurity breaches;

- our continued reliance on third parties to conduct additional clinical trials of our drug candidates, and for the manufacture of our drug candidates for preclinical studies and clinical trials;
- our ability to obtain, and negotiate favorable terms of, any collaboration, licensing or other arrangements that may be necessary or desirable to develop, manufacture, or commercialize our drug candidates;
- the pricing and reimbursement of our current drug candidates and other drug candidates we may develop, if approved;
- our estimates regarding expenses, future revenue, capital requirements, and needs for additional financing;
- our financial performance;
- the period over which we estimate our existing cash and cash equivalents will be sufficient to fund our future operating expenses and capital expenditure requirements;
- our ability to raise substantial additional funding;
- the impact of current and future laws and regulations, and our ability to comply with all regulations that we are, or may become, subject to;
- the need to hire additional personnel and our ability to attract and retain such personnel;
- the impact of any current or future litigation, which may arise during the ordinary course of business and be costly to defend;
- our expectations regarding the period during which we will qualify as an emerging growth company under the JOBS Act;
- our anticipated use of our existing resources and the net proceeds from this offering; and
- other risks and uncertainties, including those listed under the caption “Risk Factors.”

We have based these forward-looking statements largely on our current expectations and projections about our business, the industry in which we operate, and financial trends that we believe may affect our business, financial condition, results of operations, and prospects, and these forward-looking statements are not guarantees of future performance or development. These forward-looking statements speak only as of the date of this prospectus and are subject to a number of risks, uncertainties and assumptions described in the section titled “Risk Factors” and elsewhere in this prospectus. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein until after we distribute this prospectus, whether as a result of any new information, future events, or otherwise.

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 prospectus, 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 you are cautioned not to unduly rely upon these statements.

MARKET, INDUSTRY, AND OTHER DATA

This prospectus contains estimates, projections, and other information concerning our industry, our business and the markets for our drug candidates, including data regarding the estimated size of such markets and the incidence of certain medical conditions. We obtained the industry, market, and similar data set forth in this prospectus from our internal estimates and research and from academic and industry research, publications, surveys, and studies conducted by third parties, including governmental agencies. In some cases, we do not expressly refer to the sources from which this data is derived. Information that is based on estimates, forecasts, projections, market research, or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances that are assumed in this information. While we believe that the data we use from third parties are reliable, we have not separately verified this data. Any industry forecasts are based on data (including third-party data), models, and experience of various professionals and are based on various assumptions, all of which are subject to change without notice. Further, while we believe our internal research is reliable, such research has not been verified by any third party. While we are not aware of any misstatements regarding the market data presented herein, industry forecasts and projections involve risks and uncertainties and are subject to change based on various factors, including those discussed under the heading “Risk Factors.”

USE OF PROCEEDS

We estimate that the net proceeds to us from the sale of the shares of our common stock in this offering will be approximately $ million, or approximately $ million if the underwriters exercise their option to purchase additional shares in full, based upon the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us.

Each $1.00 increase or decrease in the assumed initial public offering price of $ per share would increase or decrease, as applicable, the net proceeds to us from this offering by approximately $ million, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase or decrease of 1.0 million shares in the number of shares offered by us would increase or decrease, as applicable, the net proceeds to us from this offering by approximately $ million, assuming the assumed initial public offering price remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The principal purposes of this offering are to obtain additional capital to support our operations, establish a public market for our common stock and facilitate our future access to the public capital markets.

We currently intend to use the net proceeds from this offering, together with our existing cash and cash equivalents, as follows:

- approximately $ million to $ million to fund research and development activities including but not limited to the operation of our platform, drug discovery and research programs, and continued development of the programs in our pipeline, including designing and conducting preclinical studies and clinical trials, as well as funding infrastructure to support our pipeline;
- approximately $ million to fund the paydown of debt; and
- the remaining amounts to fund working capital, other general corporate purposes and strategic investments, including through Induction Labs. However, we do not have agreements or commitments for any investments at this time.

Based on our current operating plan, we believe that the net proceeds from this offering, together with our existing cash and cash equivalents, borrowings available to us and short-term investments as of the date of this prospectus, will be sufficient to fund our operating expenses and capital expenditures for at least the next months. We have based this estimate on assumptions that may prove to be wrong, and we could deplete our available capital resources sooner than we expect. The anticipated net proceeds from this offering, together with our cash and cash equivalents, may not be sufficient for us to advance our drug candidates through regulatory approval, and we may need to raise additional capital to complete the development, clinical trials and commercialization of our drug candidates.

Our expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions. We cannot predict with certainty all of the particular uses for the net proceeds to be received upon the completion of this offering or the amounts that we will actually spend on the uses set forth above and we may require additional funds in order to fully accomplish the specified uses listed above. We believe opportunities may exist from time to time to expand our current business through in-licenses or acquisitions of, or investments in, complementary businesses, products

or technologies. While we have no current agreements, commitments or understandings for any specific in-licenses, acquisitions, or investments at this time, we may use a portion of the net proceeds for these purposes, subject to applicable regulatory restrictions. As a result, our management will have broad discretion over the use of the net proceeds from this offering.

The amounts and timing of our actual expenditures may vary significantly depending on numerous factors, including the progress of our research and development, the timing and success of preclinical studies, clinical studies we may commence in the future, the timing of patient enrollment in clinical trials, the timing of regulatory submissions and evolving regulatory requirements, any collaboration arrangements that we may enter into with third parties or strategic opportunities that become available to us, and any unforeseen cash needs.

Pending their use, we intend to invest the net proceeds of this offering in short- and intermediate-term, interest-bearing obligations, investment-grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government, subject to applicable regulatory restrictions. We cannot predict whether the proceeds invested will yield a favorable return.

DIVIDEND POLICY

We have never declared or paid any cash dividends on our capital stock. We currently intend to retain any future earnings and do not expect to pay any dividends in the foreseeable future. Any future determination to declare cash dividends will be made at the discretion of our board of directors, subject to applicable laws, and will depend on a number of factors, including our financial condition, results of operations, capital requirements, contractual restrictions, general business conditions, and other factors that our board of directors may deem relevant, including restrictions in our current and future debt instruments, our future earnings, capital requirements, financial condition, prospects, and applicable Delaware law, which provides that dividends are only payable out of surplus or current net profits.

CAPITALIZATION

The following table sets forth our cash and cash equivalents and capitalization as of December 31, 2020:

- on an actual basis;
- on a pro forma basis, giving effect to i) the automatic conversion of all outstanding shares of our convertible preferred stock into an aggregate of shares of common stock immediately prior to the completion of this offering and ii) the filing and effectiveness of our amended and restated certificate of incorporation immediately prior to the completion of this offering; and
- on a pro forma as adjusted basis to reflect i) the pro forma adjustments set forth above and ii) our issuance and sale of shares of common stock in this offering at the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The pro forma as adjusted information set forth below is illustrative only and will depend on the actual initial public offering price and other terms of this offering determined at pricing. You should read this information in conjunction with our financial statements and the related notes appearing elsewhere in this prospectus, as well as the sections titled “Selected Financial Data” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.”

	As of December 31, 2020		
	Actual	Pro forma	Pro forma as adjusted[1]
		(unaudited) (in thousands)	
Cash and cash equivalents	$	$	$
Convertible preferred stock, $0.00001 par value per share; shares authorized, shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted			
Stockholders’ deficit:			
Preferred stock, $0.00001 par value per share; shares authorized, issued and outstanding, actual shares authorized, shares issued and outstanding, pro forma and pro forma as adjusted			
Common stock, $0.00001 par value per share; shares authorized, shares issued and outstanding, actual; shares authorized, shares issued and outstanding, pro forma; shares authorized, shares issued and outstanding, pro forma as adjusted			
Additional paid-in capital			
Accumulated deficit			
Total stockholders’ deficit			
Total capitalization	$	$	$

(1) Each $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease, as applicable, each of our pro forma as adjusted cash and cash equivalents, additional paid-in capital, total stockholders’ deficit and total capitalization by approximately $ million, assuming that the number of shares of common stock offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase or decrease of 1.0 million shares in the number of shares of common stock offered by us would increase or decrease, as applicable, each of our pro forma as adjusted cash and cash equivalents, additional paid-in capital, total stockholders’ deficit and total capitalization by approximately $ million, assuming the assumed initial public offering price of $ per share, remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

If the underwriters' option to purchase additional shares is exercised in full, our pro forma as adjusted cash and cash equivalents, additional paid-in capital, total stockholders' deficit, and total capitalization as of December 31, 2020, would be $ million, $ million, $ million, and $ million, respectively.

The number of shares of our common stock issued and outstanding, pro forma and pro forma as adjusted in the table above is based on shares of our common stock outstanding as of December 31, 2020, and excludes:

- shares of common stock issuable upon the exercise of options outstanding as of December 31, 2020, with a weighted-average exercise price of $ per share;
- shares of common stock issuable upon the exercise of options granted after December 31, 2020, with a weighted-average exercise price of $ per share;
- shares of common stock issuable upon the exercise of warrants outstanding as of December 31, 2020;
- shares of common stock for future issuance under our 2016 Plan, as of December 31, 2020, which shares will be added to the shares to be reserved for future issuance under our 2021 Plan;
- shares of common stock reserved for future issuance under our 2021 Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of common stock reserved for future issuance under this plan; and
- shares of common stock reserved for future issuance under our 2021 ESPP, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of common stock reserved for future issuance under this plan.

DILUTION

Investors purchasing our common stock in this offering will experience immediate and substantial dilution in the pro forma as adjusted net tangible book value of their shares of common stock. Dilution in pro forma as adjusted net tangible book value represents the difference between the initial public offering price of our common stock and the pro forma as adjusted net tangible book value per share of our common stock immediately after the offering.

Our historical net tangible book deficit as of December 31, 2020, was $ million, or $ per share of our common stock. Our historical net tangible book value (deficit) is the amount of our total tangible assets less our total liabilities and convertible preferred stock, which is not included within our stockholders' deficit. Historical net tangible book value (deficit) per share represents historical net tangible book value (deficit) divided by the number of shares of our common stock outstanding as of December 31, 2020.

Our pro forma net tangible book value as of December 31, 2020, was $ million, or $ per share of our common stock. Pro forma net tangible book value represents the amount of our total tangible assets less our total liabilities. Pro forma net tangible book value per share represents pro forma net tangible book value divided by the total number of shares outstanding as of December 31, 2020, after giving effect to the automatic conversion of all outstanding shares of our convertible preferred stock as of December 31, 2020, into an aggregate of shares of our common stock immediately prior to the completion of this offering as if such conversion had occurred on December 31, 2020.

After giving further effect to our sale of shares of common stock in this offering at the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of December 31, 2020, would have been approximately $ million, or approximately $ per share. This represents an immediate increase in pro forma net tangible book value per share of approximately $ to our existing stockholders and an immediate dilution in pro forma net tangible book value per share of approximately $ to investors purchasing shares of common stock in this offering.

The following table illustrates this dilution on a per share basis to new investors (without giving effect to any exercise by the underwriters of their option to purchase additional shares):

Assumed initial public offering price per share		$
Historical net tangible book value (deficit) per share as of December 31, 2020	$	
Pro forma increase in net tangible book value per share as of December 31, 2020		
Pro forma net tangible book value per share as of December 31, 2020		
Increase in pro forma net tangible book value per share attributable to investors purchasing shares of common stock in this offering		
Pro forma as adjusted net tangible book value per share		
Dilution per share to investors participating in this offering		$

Each $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease, as applicable, the pro forma as adjusted net tangible book value per share after

this offering by approximately $ per share and the dilution to investors purchasing shares of common stock in this offering by approximately $ per share, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase of 1.0 million shares in the number of shares offered by us would increase the pro forma as adjusted net tangible book value per share after this offering by approximately $ and decrease the dilution per share to investors purchasing shares of common stock in this offering by approximately $, assuming no change in the assumed initial public offering price and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each decrease of 1.0 million shares in the number of shares offered by us would decrease the pro forma as adjusted net tangible book value per share after this offering by approximately $ and increase the dilution per share to investors purchasing shares of common stock in this offering by approximately $, assuming no change in the assumed initial public offering price and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

If the underwriters exercise their option to purchase additional shares of common stock in this offering in full at the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus and assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, the pro forma as adjusted net tangible book value per share after this offering would be approximately $ per share, and the dilution per share to investors purchasing shares of common stock in this offering would be approximately $ per share.

The following table summarizes, on the pro forma as adjusted basis described above, as of December 31, 2020, the number of shares of common stock purchased from us, the total consideration paid, or to be paid, and the weighted-average price per share paid, or to be paid, by existing stockholders and by investors purchasing shares in this offering at the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, before deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

	Shares purchased		Total consideration		Weighted-average price per share
(dollar amounts in thousands, except per share amounts)	Number	Percent	Amount	Percent	
Existing stockholders before this offering		%	$	%	$
Investors purchasing shares in this offering					$
Total		100%	$	100%	

The table above assumes no exercise of the underwriters' option to purchase additional shares in this offering. If the underwriters' option to purchase additional shares is exercised in full, the number of shares of our common stock held by existing stockholders would be reduced to % of the total number of shares of our common stock outstanding after this offering, and the number of shares of common stock held by investors purchasing shares of common stock in the offering would be increased to % of the total number of shares outstanding after this offering.

Each $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease, as applicable, the total consideration paid by investors purchasing shares in this offering by approximately $ million, assuming that the number of shares offered by us, as set

forth on the cover page of this prospectus, remains the same. Similarly, each increase or decrease of 1.0 million shares in the number of shares offered by us would increase or decrease, as applicable, the total consideration paid by investors purchasing shares in this offering by approximately $ million, assuming no change in the assumed initial public offering price.

The foregoing tables and calculations (other than the historical net tangible book value calculation) are based on shares of our common stock outstanding as of December 31, 2020, and excludes:

- shares of common stock issuable upon the exercise of options outstanding as of December 31, 2020, with a weighted-average exercise price of $ per share;
- shares of common stock issuable upon the exercise of options granted after December 31, 2020, with a weighted-average exercise price of $ per share;
- shares of common stock issuable upon the exercise of warrants outstanding as of December 31, 2020;
- shares of common stock for future issuance under our 2016 Plan as of December 31, 2020, which shares will be added to the shares to be reserved for future issuance under our 2021 Plan;
- shares of common stock reserved for future issuance under our 2021 Plan, which will become effective in connection with this offering as well as any automatic increases in the number of shares of common stock reserved for future issuance under this plan; and
- shares of common stock reserved for future issuance under our 2021 ESPP, which will become effective in connection with this offering as well as any automatic increases in the number of shares of common stock reserved for future issuance under this plan.

To the extent that any outstanding options are exercised or new options are issued under our equity benefit plans, or we issue additional shares of common stock or other securities convertible into or exercisable or exchangeable for shares of our capital stock in the future, there will be further dilution to investors purchasing shares of common stock in this offering.

SELECTED CONSOLIDATED FINANCIAL DATA

The following tables summarize our selected financial data for the periods and as of the dates indicated. We have derived our selected statements of operations data for the years ended December 31, 2019 and 2020, and the balance sheet data as of December 31, 2019 and 2020, from our audited financial statements appearing elsewhere in this prospectus. You should read the following selected financial data together with our financial statements and the related notes appearing elsewhere in this prospectus and the information in the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations."

	Year Ended December 31,	
	2019	2020
	(in thousands, except share and per share data)	
Consolidated Statement of Operations Data:		
Revenue:		
Grant revenue	$ 608	$
Operating revenue	1,711	
Total revenue	2,319	
Operating expenses:		
Research and development expenses	45,809	
General and administrative	18,951	
Total operating expenses	64,760	
Loss from operations	(62,441)	
Other income, net	562	
Net loss and comprehensive loss	$ (61,879)	$
Net loss per share, basic and diluted(1)	$ (4.30)	$
Weighted average shares of common stock, basic and diluted	14,380,177	
Pro forma net loss per share, basic and diluted (unaudited)(2)	$ (0.96)	$
Pro forma weighted-average shares outstanding used in computing pro forma net loss per share, basic and diluted (unaudited)	64,746,144	

(1) See Note 11 to our consolidated financial statements appearing at the end of this prospectus for details on the calculation of basic and diluted net loss per share.
(2) Unaudited pro forma basic and diluted net loss per share were computed to give effect to the automatic conversion of all outstanding shares of convertible preferred stock into shares of common stock in connection with a qualified initial public offering, using the as-converted method as though the conversion had occurred as of the beginning of the period presented or the date of issuance, if later.

	As of December 31,	
	2019	2020
	(in thousands)	
Consolidated Balance Sheet Data:		
Cash and cash equivalents	$ 69,883	
Working capital(1)	69,714	
Total assets	101,431	
Convertible preferred stock	201,109	
Total stockholders' deficit	(124,265)	

(1) Working capital is defined as current assets less current liabilities.

Management's Discussion and Analysis of Financial Condition and Results of Operations

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with the "Selected Consolidated Financial Data" section of this prospectus and our consolidated financial statements and related notes appearing at the end of this prospectus. Some of the information contained in this discussion and analysis or set forth elsewhere in this prospectus, including information with respect to our plans and strategy for our business and related financing, includes forward-looking statements that involve risks and uncertainties. As a result of many factors, including those factors set forth in the "Risk Factors" section of this prospectus, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are a clinical-stage biotechnology company decoding biology by integrating technological innovations across biology, chemistry, automation, data science and engineering to radically improve the lives of patients and industrialize drug discovery. Central to our mission is the Recursion Operating System that combines an advanced infrastructure layer to generate what we believe is one of the world's largest and fastest-growing proprietary biological and chemical datasets, and the Recursion Map, a suite of custom software, algorithmic and machine learning tools that we use to explore foundational biology unconstrained by human bias, navigate to new biological insights, and rapidly accelerate programs. The combination of wet-lab biology and in silico tools in our closed-loop system accelerates our drug discovery process and differentiates us from others within the industry. Similarly, our balanced team of life scientists and computational and technical experts creates an environment where empirical data, statistical rigor, and creative thinking are brought to bear on every decision. Thus far, we have leveraged our Recursion Operating System to create three value drivers: i) a pipeline of 35 internally-developed programs focused on areas of significant unmet need, several of which have market opportunities in excess of $1.0 billion in annual sales, ii) strategic partnerships with leading biopharmaceutical companies, and iii) Induction Labs, a growth engine created to explore new extensions of the Recursion Operating System both within and beyond therapeutics. Our pipeline has doubled in size since 2019, and we expect to continue accelerating the pace of program additions in the future. As such, we are a biotechnology company scaling more like a technology company.

Integrating technological innovations across biology, chemistry, automation, data science and engineering in order to industrialize the discovery of therapeutics has required us to raise significant capital and adopt a long-term approach to capital allocation that balances near-term risks and long-term value creation. Of our pipeline of 35 programs, we have four drug candidates that we expect will be entering clinical trials in . We have assembled an exceptional team of over 200 employees as of December 31, 2020. Approximately 40% of our full-time employees are biology and chemistry employees and 35% of our full-time employees are data science and software engineering employees.

From inception to December 31, 2020, we have raised approximately $449.2 million in equity financing from investors in addition to $30.0 million in an upfront payment from our strategic partnership with Bayer. We use the capital we have raised to fund operations and investing activities across platform research operations, drug discovery, clinical development, digital and other infrastructure, creation of our portfolio of intellectual property, and administrative support. We do not have any products approved for commercial sale and have not generated any revenues from product sales. We had cash and cash equivalents of $ million as of December 31, 2020.

Since inception, we have incurred significant operating losses. Our net losses were $61.9 million and $ million for the years ended December 31, 2019 and 2020, respectively. As of

December 31, 2020, our accumulated deficit was $ million. We expect to continue to incur significant expenses and operating losses for the foreseeable future. In addition, we anticipate that our expenses will increase significantly in connection with our ongoing activities, as we:

- continue our platform research and drug discovery and clinical development efforts;
- continue to invest in the scale and scope of our platform research capabilities in order to identify novel biology and therapeutics;
- continue to invest in expansions of the modality capabilities across our platform including large molecules and RNA therapeutics;
- invest in or acquire companies or intellectual property that achieves our platform objectives;
- accelerate investments in mechanisms to significantly expand our total addressable markets through Induction Labs;
- utilize our platform to identify and validate additional therapeutic candidates, technologies, and business opportunities;
- initiate additional preclinical studies or clinical or other trials for our product candidates, including under our collaboration agreements;
- continue or expand the scope of our clinical trials for our product candidates;
- conduct the above and below development activities on an extensive pipeline of therapeutic candidates across diverse areas of biology;
- establish agreements with contract research organizations, or CROs, and contract manufacturing organizations, or CMOs, in connection with our preclinical studies and clinical trials;
- change or add to internal manufacturing capacity or capability;
- change or add additional suppliers;
- seek regulatory approval for our therapeutic candidates;
- seek marketing approvals and reimbursement for our therapeutic candidates;
- establish a sales, marketing, and distribution infrastructure to commercialize any products for which we may obtain marketing approval;
- acquire or in-license other therapeutic candidates and technologies;
- make milestone or other payments under any in-license agreements;
- maintain, protect, defend, enforce, and expand our intellectual property portfolio;
- add additional infrastructure to our quality control, quality assurance, legal, compliance, and other groups to support our operations as we progress our therapeutics candidates toward commercialization;
- add additional infrastructure to support our operations as a public company and our product development and future commercialization efforts, including expansion of company sites;
- attract and retain world-class talent, including in competitive areas; and
- experience any delays or encounter issues with any of the above.

We will not generate revenue from the sale of our drug candidates unless and until we successfully complete clinical development and obtain regulatory approval for our drug candidates. If we are able to obtain regulatory approval for any of our therapeutic candidates, we may incur

significant commercialization expenses related to developing our commercialization capabilities to support product sales, marketing, and distribution activities, either alone or in collaboration with others. Furthermore, upon the closing of this offering, we expect to incur additional costs associated with operating as a public company, including significant legal, accounting, investor relations, and other expenses that we did not incur as a private company.

As a result, we will need substantial additional funding to support our continued operations and pursue our growth strategy. Until we can generate significant revenue from pharmaceutical product sales, if ever, we expect to finance our operations through a combination of public or private equity offerings and debt financings, government funding arrangements, collaborations and marketing, distribution and licensing arrangements. We may be unable to raise additional funds or enter into such other arrangements on favorable terms, or at all. If we fail to raise capital or enter into such arrangements as, and when, needed, we may have to significantly delay, scale back or discontinue the development and commercialization of one or more product candidates, or delay our pursuit of potential in-licenses or acquisitions.

Because of the numerous risks and uncertainties associated with pharmaceutical development, we are unable to predict the timing or amount of increased expenses or when or if we will be able to achieve or maintain profitability. Even if we are able to generate revenues from the sale of our products, we may not become profitable. If we fail to become profitable or are unable to sustain profitability on a continuing basis, then we may be unable to continue our operations at planned levels and may be forced to reduce our operations.

Strategic Agreements

Listed below are the strategic agreements that may have an impact on our results of operations:

Bayer

In August 2020, we entered into a Research Collaboration and Option Agreement, the Bayer Agreement, with Bayer AG, or Bayer, for a five-year term pursuant to which we and Bayer may initiate more than ten research projects related to fibrosis across multiple organ systems, including lung, liver, and heart. We received an upfront technology access fee of $30.0 million in September 2020 as part of the Bayer Agreement. Under each research project, we will work with Bayer to identify potential candidates for development. If Bayer exercises an option for a license to a potential candidate, we would receive option exercise fees, the potential to receive development and commercial milestones of more than $100 million, as well as tiered royalties for each such license.

REC-2282: Ohio State Innovation Foundation In-License

In December 2018, we entered into an Exclusive License Agreement with the Ohio State Innovation Foundation, or OSIF, pursuant to which we obtained a license to certain rights controlled by OSIF and related to the pan-histone deacetylase inhibitor, OSU-HDAC42, or REC-2282, to develop, make, have made, use, sell, offer for sale, and import products incorporating OSU-HDAC42 worldwide. OSIF also assigned certain assets to us, relating to the pharmaceutical composition known as AR-42. In consideration for the license, we paid OSIF an upfront payment of $2.0 million in December 2018 and are obligated to pay OSIF certain milestones, totaling up to $20 million dollars, as well as mid-single digit royalties on net sales of the licensed products. In addition, we owe 25% of any non-royalty sublicensing consideration prior to a Phase II clinical trial or 15% of such sublicensing consideration after initiation of a Phase II clinical trial, provided that milestone payments are creditable against these sublicensing fees. As of the date of this prospectus, we have not made any milestone or royalty payments to OSIF.

REC-3599: Chromaderm License Agreement

In December 2019, we entered into a License Agreement with Chromaderm, Inc., or Chromaderm, pursuant to which we obtained an exclusive license under certain rights controlled by Chromaderm to ruboxistaurin, an inhibitor of protein kinase C, in non-topical formulations for all uses other than the treatment, prevention, and/or diagnosis of skin hyperpigmentation conditions or disorders. Under the agreement, we paid Chromaderm an upfront payment of $1.25 million in December 2019. We are obligated to pay Chromaderm certain development and approval milestones with respect to the licensed products, totaling up to $35.5 million for a first indication and up to $52.5 million if multiple indications are pursued, and certain commercial milestones totaling up to $49 million. Finally, we will owe Chromaderm mid single-digit to low double-digit tiered royalties on net sales of REC-3599. As of the date of this prospectus, we have not made any milestone or royalty payments to Chromaderm.

REC-4881: Takeda License Agreement

In May 2020, we entered into a License Agreement, or the Takeda In-License, with Takeda Pharmaceutical Company Limited, or Takeda, pursuant to which we obtained an exclusive license (even as to Takeda and its affiliates) to certain rights to Takeda's clinical-stage compound known as TAK-733, a non-ATP-competitive allosteric inhibitor of MEK1 and MEK2. We are required to use commercially reasonable efforts to develop and commercialize at least one licensed product in each of (a) the US, (b) at least three of the following European countries: the United Kingdom, France, Germany, Italy and Spain, and (c) Japan. Upon execution of the agreement, we paid an upfront fee of $1.5 million to Takeda in May 2020. Under the Takeda In-License, we are obligated to pay Takeda milestone amounts totaling up to $39.5 million upon achievement of specified development and regulatory milestone events. In addition, we are obligated to pay Takeda low-to-mid single-digit royalties based on net sales of products containing the licensed compounds by us, our affiliates or sublicensees, subject to specified reductions. As of the date of this prospectus, we have not made any milestone or royalty payments to Takeda.

For more information on these Strategic Agreements see "Business—Strategic Agreements."

Components of Operating Results

Revenues

To date, our business generates revenue from two sources: i) grant revenue and ii) operating revenue.

Grant Revenue—We recognize grant revenue in the period in which the revenue is earned in accordance with the associated grant agreement, which is the period in which corresponding reimbursable expenses under the grant agreement are incurred. Grant revenue was generated from grants awarded by the National Institute of Health and the Bill and Melinda Gates Foundation.

Operating Revenue—Operating revenue is primarily generated through funded research and development agreements derived from strategic alliances such as our strategic partnership with Bayer. We are entitled to receive variable consideration as certain milestones are achieved. The timing of revenue recognition is not directly correlated to the timing of cash receipts.

Research and Development

Research and development expenses account for a significant portion of our operating expenses. We recognize research and development expenses as incurred. Research and development expenses comprise costs incurred in performing research and development activities, including:

- cost to develop and operate our platform;
- discovery efforts leading to development candidates;
- clinical development costs for our programs;
- costs associated with discovery as well as clinical development efforts, including research materials and external research;
- materials and supply costs associated with the manufacture of drug substance and drug product for preclinical testing and clinical trials;
- personnel-related expenses, including salaries, benefits, bonuses, and stock-based compensation for employees engaged in research and development functions;
- costs associated with operating our digital infrastructure; and
- facilities, depreciation and amortization, insurance and other direct and allocated expenses incurred as a result of research and development activities.

We recognize expenses associated with third-party contracted services based on the completion of activities as specified in the applicable contracts. Upon termination of contracts with third parties, our financial obligations are limited to costs incurred or committed to date. Any advance payments for goods or services to be used or rendered in future research and product development activities pursuant to a contractual arrangement are classified as prepaid expenses until such goods or services are rendered.

General and Administrative

We expense general and administrative costs as incurred. General and administrative expenses consist primarily of salaries, benefits, stock-based compensation, and outsourced labor for personnel in executive, finance, human resources, legal and other corporate administrative functions. General and administrative expenses also include legal fees incurred relating to corporate and patent matters, professional fees incurred for accounting, auditing, tax and administrative consulting services, insurance costs, facilities and depreciation expenses.

We expect that our general and administrative expenses will increase in the future to support personnel in research and development and to support our operations generally as we increase our research and development activities and activities related to the potential commercialization of our initial drug candidates REC-4881, REC-3599, REC-2282, and REC-994. We also expect to incur increased expenses associated with operating as a public company, including costs of accounting, audit, legal, regulatory, and tax-related services associated with maintaining compliance with exchange listing and Securities and Exchange Commission, or SEC, requirements, director and officer insurance costs, and investor and public relations costs.

Other Income, Net

Other income, net primarily consists of interest earned on our cash and cash equivalents, interest expense incurred under our loan agreements, loss on extinguishment of debt related to write-off of unamortized debt issuance costs, and payment of a final payment fee.

Results of Operations

Comparison of the Years ended December 31, 2019 and 2020

The following table summarizes our results of operations for the periods indicated:

	Year Ended December 31,		Change	
	2019	2020	$	%
	(in thousands, except percentages)			
Revenue				
Grant revenue	$ 608			
Operating revenue	1,711			
Total revenue	2,319			
Operating expenses				
Research and development expenses	45,809			
General and administrative	18,951			
Total operating expenses	64,760			
Loss from operations	(62,441)			
Other income, net	562			
Net loss and comprehensive loss	$(61,879)			

Revenue

The following table summarizes the components of revenue recognized for the years ended December 31, 2019 and 2020.

	Years Ended December 31,		Change	
	2019	2020	$	%
	(in thousands, except percentages)			
Revenue				
Grant revenue	$ 608			
Operating revenue	1,711			
Total revenue	$2,319			

Revenue increased by $, or %, to $ million for the year ended December 31, 2020 compared to $2.3 million for the year ended December 31, 2019. The increase in revenue was due to .

Research and Development

The following table summarizes the components of research and development expense for the years ended December 31, 2019 and 2020.

	Year Ended December 31,		Change	
	2019	2020	$	%
	(in thousands, except percentages)			
Research and development expenses				
Platform	$19,617			
Discovery	15,423			
Clinical	8,221			
Stock based compensation	947			
Other	1,601			
Total program expenses	$45,809			

Significant components of research and development include the following expense categories: Platform, which refers primarily to expenses related to screening through hit identification; Discovery, which refers primarily to expenses related to hit identification through development candidate; and Clinical, which refers primarily to expenses related to development candidate and beyond.

Research and development expenses increased by $, or %, to $ million for the year ended December 31, 2020 compared to $45.8 million for the year ended December 31, 2019. The increase in research and development expenses was due to .

General and Administrative Expenses

The following table summarizes the components of general and administrative expense for the years ended December 31, 2019 and 2020.

	Year Ended December 31,		Change	
	2019	2020	$	%
	(in thousands, except percentages)			
Total general and administrative	$18,951			

General and administrative expenses increased by $, or %, to $ million for the year ended December 31, 2020 compared to $19.0 million for the year ended December 31, 2019. The increase in general and administrative expenses was due to .

Other Income, Net

The following table summarizes the components of other income, net for the years ended December 31, 2019 and 2020.

	Year Ended December 31,		Change	
	2019	2020	$	%
	(in thousands, except percentages)			
Interest income	$ 1,741			
Interest expense	(635)			
Loss on extinguishment on debt	(555)			
Gain on remeasurement on fair value of warrants	11			
Other income, net	$ 562			

Other income, net by $, or %, to $ million for the year ended December 31, 2020 compared to $1.1 million for the year ended December 31, 2019. The in other income, net was due to .

Liquidity and Capital Resources

Sources of Liquidity

We have not yet commercialized any products and we do not expect to generate revenue from sales of any product candidates for several years. Cash and cash equivalents totaled $69.9 million as of December 31, 2019 and $ million as of December 31, 2020. We consider all highly liquid investments with maturities of 90 days or less when purchased to be cash equivalents.

We have incurred operating losses and experienced negative operating cash flows, and we anticipate that we will continue to incur losses for at least the foreseeable future. Our net loss totaled $61.9 million for the year ended December 31, 2019 and $ million for the year ended December 31, 2020. As of December 31, 2019 and December 31, 2020, we had an accumulated deficit of $126.6 million and $ million, respectively.

To date, we have financed our operations primarily through private placements of preferred stock. Through December 31, 2019, we had received gross proceeds of $21.3 million from sales of our Series A Preferred Stock, $60.0 million from sales of our Series B Preferred Stock, and $122.1 million from sales of our Series C Preferred Stock.

In September and October 2020, we received gross proceeds of over $245.9 million from sales of our Series D Preferred Stock as well as $30.0 million in an upfront payment from our strategic partnership with Bayer.

Midcap Credit and Security Agreement

In September 2019, we entered into a Credit and Security Agreement with Midcap Financial Trust, or Midcap, which we refer to as our Credit Agreement. The Credit Agreement includes: i) an initial term loan in an aggregate principal amount of $11.9 million; and ii) a second tranche term loan, which if drawn would result in an aggregate outstanding maximum principal amount of $26.9 million. The second tranche will become available to be drawn upon the achievement of certain drug development milestones. We are required to make interest-only payments from September 2019 to September 2021, and thereafter, 36 monthly principal payments of $0.3 million plus interest commencing in October 2021 and continuing until the maturity date in September 2021. The interest-only period will be extended an additional 12 months upon achievement of certain fundraising related milestones. Interest accrues on the principal amount outstanding at a floating per annum rate equal to the LIBOR rate plus 5.75%.

The debt is secured against all of our assets. The Credit Agreement includes standard affirmative and restrictive covenants and standard events of default, including payment defaults, breaches of covenants following any applicable cure period, a material impairment in the perfection or priority of Midcap's security interest or in the value of the collateral and a material adverse change in our business, operations, or conditions. Upon the occurrence of an event of default and following any applicable cure periods, Midcap may declare all outstanding obligations immediately due and payable and take such other actions as set forth in the Credit Agreement. At December 31, 2020, we were in compliance with all debt covenants under the Credit Agreement. In 2019, we paid fees of approximately $0.3 million in connection with the origination of the Credit Agreement. These fees were deferred and recorded as a direct deduction from the carrying value of the loan payable and are amortized to interest expense over the remaining term of the Credit Agreement.

Cash Flows

The following table sets forth the primary sources and uses of cash and cash equivalents for each of the periods presented below:

	Year Ended December 31,	
	2019	2020
	(in thousands)	
Cash used in operating activities	$ (57,042)	
Cash used in investing activities	(3,910)	
Cash provided by financing activities	120,410	
Net increase in cash and cash equivalents	$ 59,458	

Operating Activities

Net cash used in operating activities was $ million for the year ended December 31, 2020. Cash used in operating activities was due to the use of funds in connection with our operations, resulting in a net loss of $ million, adjusted by non-cash charges of $ million and by a change in operating assets and liabilities of $ million. Non-cash items included stock-based compensation expense of $ million and depreciation and amortization of $ million, offset by amortization of lease incentive obligation of $ million. The net change in assets and liabilities was primarily due to an increase in other assets of $ million, offset by a decrease in accounts payable of $ million and a decrease of accrued expenses, deferred revenue, and other current liabilities of $ million.

Net cash used in operating activities was $57.0 million for the year ended December 31, 2019. Cash used in operating activities was due to the use of funds in connection with our operations, resulting in a net loss of $61.9 million, adjusted by non-cash charges of $4.4 million and by a change in operating assets and liabilities of $0.4 million. Non-cash items included stock-based compensation expense of $1.4 million and depreciation and amortization of $3.5 million, offset by amortization of lease incentive obligation of $0.5 million. The net change in assets and liabilities was primarily due to an increase in other assets of $0.6 million, offset by a decrease in accounts payable of $0.3 million and an increase in accrued expenses, deferred revenue, and other current liabilities of $0.1 million.

Investing Activities

Net cash used in investing activities was $ million for the year ended December 31, 2020. Cash used in investing activities was used in the purchase of .

Net cash used in investing activities was $3.9 million for the year ended December 31, 2019, which was used in the purchase of property and equipment, $3.5 million of which was for the purchase of lab equipment, and $0.4 million of which was for office equipment, fixtures, and leasehold improvements.

Financing Activities

Net cash used in financing activities was $ million for the year ended December 31, 2020. Cash used in financing activities was due to the use of which consisted primarily of million from the proceeds from a sale of preferred stock, less issuance costs.

Net cash provided by financing activities was $120.4 million for the year ended December 31, 2019, which consisted primarily of $119.9 million from the proceeds from a sale of preferred stock, less

issuance costs and the proceeds from long-term debt, net of issuance costs of $11.6 million. Cash flows provided by financing activities were offset by the repayment of long-term debt of $11.2 million.

Future Funding Requirements

Since inception, we have incurred significant operating losses. Our net losses were $61.9 million and $ million for the years ended December 31, 2019 and 2020, respectively. As of December 31, 2020, our accumulated deficit was $ million. Given our broad and ambitious mission, we expect to continue to incur significant expenses and operating losses for the foreseeable future. In addition, we anticipate that our expenses will increase significantly in connection with our ongoing activities, as we:

- continue our platform research and drug discovery and clinical development efforts;
- continue to invest in the scale and scope of our platform research capabilities in order to identify novel biology and therapeutics;
- continue to invest in expansions of the modality capabilities across our platform including large molecules and RNA therapeutics;
- invest in or acquire companies or intellectual property that achieves our platform objectives;
- accelerate investments in mechanisms to significantly expand our total addressable markets through Induction Labs;
- utilize our platform to identify and validate additional drug candidates, technologies, and business opportunities;
- initiate additional preclinical studies or clinical or other trials for our drug candidates, including under our collaboration agreements;
- continue or expand the scope of our clinical trials for our drug candidates;
- conduct the above and below development activities on our pipeline of drug candidates across diverse areas of biology;
- establish agreements with CROs and CMOs in connection with our preclinical studies and clinical trials;
- change or add to internal manufacturing capacity or capability;
- change or add additional suppliers;
- seek regulatory approval for our drug candidates;
- seek marketing approvals and reimbursement for our drug candidates;
- establish a sales, marketing, and distribution infrastructure to commercialize any products for which we may obtain marketing approval;
- acquire or in-license other drug candidates and technologies;
- make milestone or other payments under any in-license agreements;
- maintain, protect, defend, enforce, and expand our intellectual property portfolio;
- add additional infrastructure to our quality control, quality assurance, legal, compliance and other groups to support our operations as we progress our drug candidates toward commercialization;
- add additional infrastructure to support our operations as a public company and our product development and future commercialization efforts, including expansion of company sites;

- attract and retain world-class talent, including in competitive areas; and
- experience any delays or encounter issues with any of the above.

We believe that the anticipated net proceeds from this offering, together with our existing cash, and cash equivalents, borrowings available to us and short-term investments as of the date of this prospectus, will be sufficient to fund our operating expenses and capital expenditures for at least the next months. We have based this estimate on assumptions that may prove to be wrong, and we could exhaust our available capital resources sooner than we expect.

We do not expect to generate significant revenue from out-licensing transactions, development milestones, or royalties until we successfully complete significant drug development milestones, whether on our own or in collaboration with third parties, which we expect will take a number of years. In order to commercialize our drug candidates, we or our partners need to complete clinical development and comply with comprehensive regulatory requirements. We are subject to a number of risks and uncertainties similar to those of other companies of the same size within the biotechnology industry, such as uncertainty of clinical trial outcomes, uncertainty of additional funding, and history of operating losses.

We are subject to many other risks associated with early-stage enterprises, including increasing competition, limited operating history, the need to develop and refine our discovery platform and development operations, obtaining adequate financing to fulfill development activities, hiring management and other key personnel, scaling our laboratory processes to maximize throughput capacity, avoiding contamination and other causes of platform downtime, and integrating cross-functional operations across our teams. Successful completion of our development programs, and ultimately, the attainment of profitable operations is dependent on future events, including, among other things, our ability to secure financing, attract, retain, and motivate qualified personnel, efficiently manage our supply chain, cost-effectively expand and maintain laboratory operations to accommodate growth, protect our intellectual property, and execute strategic partnerships. Although we believe that we will be able to successfully mitigate these risks, there can be no assurance that we will be able to do so or that we will ever operate profitably.

Because of the numerous risks and uncertainties associated with the development of clinical programs and other earlier stage product candidates and because the extent to which we may enter into collaborations with third parties for development of our product candidates is unknown, we are unable to estimate the timing and amounts of increased capital outlays and operating expenses associated with completing the research and development of our product candidates. Our future capital requirements will depend on many factors, including:

- the impact of any business interruptions to our operations, including the timing and enrollment of patients in our planned clinical trials, or to those of our manufacturers, suppliers, or other vendors resulting from the COVID-19 pandemic or similar public health crisis;
- the scope, rate of progress, results, and costs of our current and future clinical trials and additional preclinical research for our programs;
- the number of future drug candidates that we pursue and their development requirements;
- the costs, timing, and outcome of regulatory review of our drug candidates;
- our ability to establish and maintain collaborations on favorable terms, if at all;
- the success of any collaborations that we may enter into with third parties;
- the extent to which we acquire or invest in businesses, products, and technologies, including entering into licensing or collaboration arrangements for drug candidates;

- the costs of preparing, filing, and prosecuting patent applications, maintaining, protecting, and enforcing our intellectual property rights, and defending intellectual property-related claims;
- our headcount growth and associated costs as we expand our business operations and our research and development activities; and
- the costs of operating as a public company.

Developing pharmaceutical products, including conducting preclinical studies and clinical trials, is a time-consuming, expensive, and uncertain process that takes years to complete, and we may never generate the necessary data or results required to obtain marketing approval for any product candidates or generate revenue from the sale of any product candidate for which we may obtain marketing approval. In addition, our drug candidates, if approved, may not achieve commercial success. Our commercial revenues, if any, will be derived from sales of drugs that we do not expect to be commercially available for many years, if ever. Accordingly, we will need to obtain substantial additional funds to achieve our business objectives.

Adequate additional funds may not be available to us on acceptable terms, or at all. We do not currently have any committed external source of funds. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest may be diluted, and the terms of these securities may include liquidation or other preferences and anti-dilution protections that could adversely affect your rights as a common stockholder. Additional debt or preferred equity financing, if available, may involve agreements that include restrictive covenants that may limit our ability to take specific actions, such as incurring debt, making capital expenditures, or declaring dividends, which could adversely impact our ability to conduct our business, and may require the issuance of warrants, which could potentially dilute your ownership interest further.

If we raise additional funds through collaborations, strategic alliances, or licensing arrangements with third parties, we may have to relinquish valuable rights to our technology, future revenue streams, research programs, or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings or collaborations, strategic alliances, or licensing arrangements with third parties when needed, we may be required to delay, limit, reduce, and/or terminate our product development programs or any future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Off-Balance Sheet Arrangements

We did not have during the period presented, and we do not currently have any off-balance sheet arrangements, as defined in the rules and regulations of the Securities and Exchange Commission.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations at December 31, 2020, and the effect that such obligations are expected to have on our liquidity and cash flows in future periods:

	Payments Due by Period				
	Total	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years
	(in thousands)				
Operating lease commitments(1)	$	$	$	$	$
Development obligations(2)					
Debt and interest					
Purchase obligations					
Total	$	$	$	$	$

(1) Represents minimum payments due under our lease for our two office locations in Salt Lake City, Utah.
(2) Represents the aggregate license maintenance fees payable under our existing research and licensing agreements with third parties.

We also have certain strategic partnership and research and license agreements with other third parties, which provide us with research services with the goal of identifying and developing product candidates until all payment obligations to the third party have expired. We have the right to terminate these agreements with a reasonable period of notice. For more information on these Strategic Agreements see “Business—Strategic Agreements.”

We enter into service agreements in the normal course of business with CROs and CMOs for clinical trials, preclinical research studies and testing, manufacturing, and other services and products for operating purposes. These contracts do not contain any minimum purchase commitments. Certain agreements provide for termination rights subject to termination fees or wind down costs. Under such agreements, we are contractually obligated to make certain payments to vendors, mainly to reimburse them for their unrecoverable outlays incurred prior to cancellation. The exact amounts of such obligations are dependent on the timing of termination, and the exact terms of the relevant agreement and cannot be reasonably estimated. As of December 31, 2020, we did not expect to cancel these agreements, and as such, the amounts under the agreements are included in the table of contractual obligations above.

During 2020, we entered into a commitment to purchase a supercomputer, accessories, and parts for an estimated price of approximately $18.6 million.

Critical Accounting Policies and Use of Estimates

Our management’s discussion and analysis of financial condition and results of operations is based on our financial statements, which have been prepared in accordance with generally accepted accounting principles in the United States, or GAAP. The preparation of our consolidated financial statements and related disclosures requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities, costs and expenses, and the disclosure of contingent assets and liabilities in our financial statements. We base our estimates on historical experience, known trends and events, and various other factors that we believe are 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. We evaluate our estimates and assumptions on an ongoing basis. Our actual results may differ from these estimates under different assumptions or conditions.

The full extent to which the COVID-19 pandemic will directly or indirectly impact our business, results of operations and financial condition, including expenses, clinical trials, and research and development costs, will depend on future developments that are highly uncertain, including as a result of new information that may emerge concerning COVID-19 and the actions taken to contain or treat COVID-19, as well as the economic impact on local, regional, national, and international markets.

While our significant accounting policies are described in more detail in the notes to our consolidated financial statements appearing at the end of this prospectus, we believe that the following accounting policies are those most critical to the judgments and estimates used in the preparation of our consolidated financial statements.

Revenue Recognition

We have generated revenue from our strategic alliances. Our alliances with strategic collaborators may contain multiple elements, including research and other licenses, options to obtain development and commercialization rights, research and development services, obligations to develop and manufacture preclinical and clinical material, and options to obtain additional research and development services and preclinical and clinical material. Such arrangements may provide for various types of payments to us, including upfront fees, funding of research and development services and preclinical and clinical material, technical, development, regulatory, and commercial milestone payments, licensing fees, option exercise fees, and royalty and earnout payments on product sales. Such payments are often not commensurate with the timing of revenue recognition and therefore result in deferral of revenue recognition.

Accrued Research and Development Expenses

As part of the process of preparing our financial statements, we are required to estimate our expenses resulting from our obligations under contracts with vendors, clinical research organizations and consultants, and under clinical site agreements in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations, which vary from contract to contract and may result in payment terms that do not match the periods over which materials or services are provided under such contracts. Our objective is to reflect the appropriate expenses in our financial statements by matching those expenses with the period in which services are performed and efforts are expended. We account for these expenses according to the timing of various aspects of the expenses, and determine accrual estimates by taking into account discussion with applicable personnel and outside service providers as to the progress of clinical trials, or the services completed. During the course of a clinical trial, we adjust our clinical expense recognition if actual results differ from estimates. We make estimates of our accrued expenses as of each balance sheet date based on the facts and circumstances known to it at that time. Our clinical trial accruals are dependent upon the timely and accurate reporting of contract research organizations and other third-party vendors. Although we do not expect estimates to be materially different from amounts actually incurred, our understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in reporting amounts that are too high or too low for any particular period.

Stock-Based Compensation

We measure stock options and other stock-based awards granted to employees, directors and non-employees based on their fair value on the date of grant and recognize compensation expense of those awards over the requisite service period, or vesting period of the respective award. We recognize the impact of forfeitures on stock-based compensation expenses as forfeitures occur. We apply the straight-line method of expense recognition to all awards with only service-based vesting conditions.

We estimate the fair value of each stock option grant on the date of grant using the Black-Scholes option-pricing model, which uses as inputs the fair value of our common stock and assumptions we make for the volatility of our common stock, the expected term of our stock options, the risk-free interest rate for a period that approximates the expected term of our stock options, and our expected dividend yield.

Determination of Fair Value of Common Stock

As there has been no public market for our common stock to date, the estimated fair value of our common stock has been determined by our board of directors, or compensation committee, as of the date of each option grant, with input from management, considering our most recently available third-party valuations of common stock and our board of directors' assessment of additional objective and subjective factors that it believed were relevant and which may have changed from the date of the most recent valuation through the date of the grant. Historically, these independent third-party valuations of our equity instruments were performed contemporaneously with identified value inflection points.

These third-party valuations were performed in accordance with the guidance outlined in the American Institute of Certified Public Accountants' Accounting and Valuation Guide, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation or the Practice Aid*. The Practice Aid identifies various available methods for allocating the enterprise value across classes of series of capital stock in determining the fair value of our common stock at each valuation date.

The assumptions used to determine the estimated fair value of our common stock are based on numerous objective and subjective factors, combined with management judgment, including:

- external market conditions affecting the pharmaceutical and biotechnology industry and trends within the industry;
- our stage of development and business strategy;
- the rights, preferences, and privileges of our redeemable convertible preferred stock relative to those of our common stock;
- the prices at which we sold shares of our redeemable convertible preferred stock;
- our financial condition and operating results, including our levels of available capital resources;
- the progress of our research and development efforts;
- equity market conditions affecting comparable public companies; and
- general U.S. market conditions and the lack of marketability of our common stock.

In accordance with the Practice Aid, the probability-weighted expected return method, or PWERM and the Option Pricing Method, or OPM, were the most appropriate methods for determining the fair value of our common stock based on our stage of development and other relevant factors.

Our valuations were performed using the OPM method. The method selected was based on availability and the quality of information to develop the assumptions for the methodology.

OPM—The OPM treats common stock and preferred stock as call options on the total equity value of a company, with exercise prices based on the value thresholds at which the allocation among the various holders of a company's securities changes. Under this method, the common stock has value only if the funds available for distribution to stockholders exceed the value of the liquidation preferences at the time of a liquidity event, such as a strategic sale or merger. The common stock is modeled as a call

option on the underlying equity value at a predetermined exercise price. In the model, the exercise price is based on a comparison with the total equity value rather than, as in the case of a regular option, a comparison with a per share stock price. Thus, common stock is considered to be a call option with a claim on the enterprise at an exercise price equal to the remaining value immediately after the preferred stock liquidation preference is paid. The OPM uses the Black-Scholes option pricing model to price the call options. This model defines the fair value of securities as functions of the current fair value of a company and uses assumptions such as the anticipated timing of a potential liquidity event and the estimated volatility of the equity securities. The OPM method was used for our 2020 valuations.

The assumptions underlying these valuations represented management's best estimates, which involved inherent uncertainties and the application of management's judgment. As a result, if we had used significantly different assumptions or estimates, the fair value of our common stock and our stock-based compensation expense could have been materially different.

Once a public trading market for our common stock has been established in connection with the closing of this offering, it will no longer be necessary for our board of directors to estimate the fair value of our common stock in connection with our accounting for granted stock options and other such awards we may grant, as the fair value of our common stock will be determined based on the quoted market price of our common stock.

The following table summarizes by grant date the options for shares of common stock granted by us during 2019 and 2020 as well as the estimated fair value per share of our common stock as of the grant date:

Grant Date	Number of Shares Subject to Option Grants	Per Share Exercise Price of Options(1)	Fair Value of Common Stock Per Share on Date of Option Grant(2)
Jan 1, 2019 - June 30, 2019	519,000	$ 3.33	$ 3.33
July 1, 2019 - Dec 31, 2019	1,256,000	3.33	3.33
Jan 1, 2020 - June 30, 2020	5,270,589	3.33	3.33
July 1, 2020 - Dec 31, 2020	3,613,458	3.71	3.71

(1) We granted options with an exercise price equal to the fair value of the common stock based on the most recent independent third-party valuation, upon approval by our board of directors. We performed valuations as of September 1, 2020, February 12, 2020, and February 12, 2019.

(2) The fair value of common stock in the table above represents the fair value of our common stock as determined by our board of directors based on our most recently available contemporaneous and independent third-party valuations, taking into consideration various objective and subjective factors. We performed retrospective valuations as of September 1, 2020, February 12, 2020, and February 12, 2019.

Impact of the COVID-19 Pandemic

In March 2020, the World Health Organization declared the outbreak of novel coronavirus disease, or COVID-19, as a pandemic. The COVID-19 pandemic is evolving, and to date has led to the implementation of various responses, including government-imposed quarantines, travel restrictions and other public health safety measures. COVID-19 has caused market volatility and uncertainty around the world in various industries and, as a result, we expect our operations may also be affected. We are closely monitoring the impact of the pandemic of COVID-19 on all aspects of our business. The extent to which COVID-19 ultimately impacts our operations and financial position will depend on future developments, which are highly uncertain and cannot be predicted with confidence, such as the duration of the outbreak, new information that may emerge concerning the severity of COVID-19 or the effectiveness of actions to contain COVID-19 or treat its impact, among others. In addition, recurrences

or additional waves of COVID-19 cases could cause other widespread or more severe impacts depending on where infection rates are highest.

We have not incurred any significant impairment losses in the carrying values of our assets as a result of the pandemic and we are not aware of any specific related event or circumstance that would require us to revise our estimates reflected in our audited consolidated financial statements.

Emerging Growth Company

In April 2012, the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, was enacted. Section 107 of the JOBS Act provides that an "emerging growth company," or an EGC, can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act of 1933, as amended, or the Securities Act, for complying with new or revised accounting standards. Thus, an EGC can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have elected to use the extended transition period for new or revised accounting standards during the period in which we remain an emerging growth company; however, we may adopt certain new or revised accounting standards early.

We will remain an emerging growth company until the earliest to occur of: i) the last day of the fiscal year in which we have more than $1.07 billion in annual revenue; ii) the date we qualify as a "large accelerated filer," with at least $700.0 million of equity securities held by non-affiliates; iii) the date on which we have issued more than $1.0 billion in non-convertible debt securities during the prior three-year period; and iv) the last day of the fiscal year ending after the fifth anniversary of our initial public offering.

We are also a "smaller reporting company" meaning that the market value of our stock held by non-affiliates plus the proposed aggregate amount of gross proceeds to us as a result of this offering is less than $700.0 million and our annual revenue was less than $100.0 million during the most recently completed fiscal year. We may continue to be a smaller reporting company after this offering if either i) the market value of our stock held by non-affiliates is less than $250.0 million or ii) our annual revenue was less than $100.0 million during the most recently completed fiscal year and the market value of our stock held by non-affiliates is less than $700.0 million. If we are a smaller reporting company at the time we cease to be an emerging growth company, we may continue to rely on exemptions from certain disclosure requirements that are available to smaller reporting companies. Specifically, as a smaller reporting company we may choose to present only the two most recent fiscal years of audited financial statements in our Annual Report on Form 10-K and, similar to emerging growth companies, smaller reporting companies have reduced disclosure obligations regarding executive compensation.

Recently Issued and Adopted Accounting Pronouncements

A description of recently issued accounting pronouncements that may potentially impact our financial position and results of operations is disclosed in Note 2 to our consolidated financial statements appearing at the end of this prospectus.

Quantitative and Qualitative Disclosures about Market Risks

Interest Rate Risk

We are subject to market risk associated with changing interest rates on our variable rate note issued under our Credit Agreement with Midcap; the interest accrues on the principal amount outstanding at a floating per annum rate equal to the LIBOR rate plus 5.75% with a LIBOR floor of 2%.

The interest rates applicable to our variable rate note may rise and increase the amount of interest expense. We do not purchase or hold any derivative instruments to protect against the effects of changes in interest rates. As of December 31, 2019 and 2020, the outstanding balance on the debt issued under our Credit Agreement with Midcap was $11.9 million and $ million, respectively.

Our cash and cash equivalents consist primarily of highly liquid investments in money market funds and cash on hand and have an original maturity date of 90 days or less. The fair value of our cash and cash equivalents would not be significantly affected by either an increase or decrease in interest rates, due mainly to the short-term nature of these instruments.

Table of Contents

Business

BUSINESS

Overview

We are a clinical-stage biotechnology company decoding biology by integrating technological innovations across biology, chemistry, automation, data science and engineering to radically improve the lives of patients and industrialize drug discovery. Central to our mission is the Recursion Operating System, or Recursion OS, that combines an advanced infrastructure layer to generate what we believe is one of the world's largest and fastest-growing proprietary biological and chemical datasets, and the Recursion Map, a suite of custom software, algorithmic and machine learning tools that we use to explore foundational biology unconstrained by human bias, navigate to new biological insights, and rapidly accelerate programs. The combination of wet-lab biology and *in silico* tools in our closed-loop system accelerates our drug discovery process and differentiates us from others within the industry. Similarly, our balanced team of life scientists (approximately 40% of employees) and computational and technical experts (approximately 35% of employees) creates an environment where empirical data, statistical rigor and creative thinking are brought to bear on every decision. Thus far, we have leveraged our Recursion Operating System to create three value drivers: i) a pipeline of 35 internally-developed programs focused on areas of significant unmet need, several of which have market opportunities in excess of $1 billion in annual sales, ii) strategic partnerships with leading biopharmaceutical companies, and iii) Induction Labs, a growth engine created to explore new extensions of the Recursion Operating System both within and beyond therapeutics. Our pipeline has doubled in size since 2019 and we expect to continue accelerating the pace of program additions in the future. As such, we are a biotechnology company scaling more like a technology company.

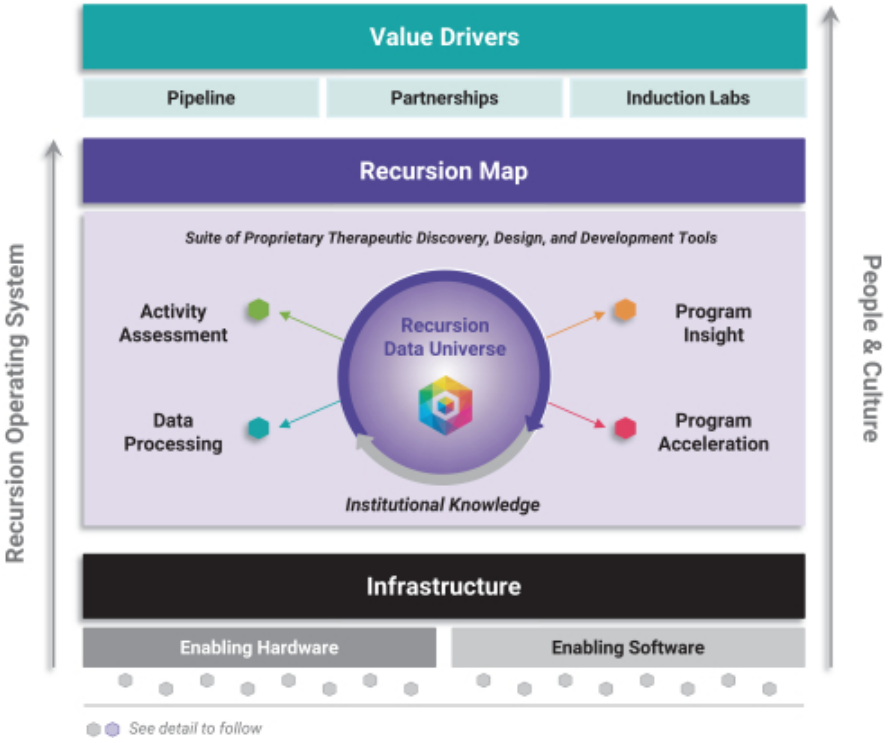


Figure 1. The Recursion Operating System (OS) for industrializing drug discovery. The Recursion OS is an integrated, multi-faceted system for generating, analyzing, and deriving insight from massive biological and chemical datasets to industrialize drug discovery. It is composed of an Infrastructure Layer of enabling hardware and software, the Recursion Data Universe, which houses our diverse and expansive datasets, and the Recursion Map, a suite of proprietary discovery, design, and development tools.

We believe we have demonstrated that our approach industrializes drug discovery, broadening the funnel of potential therapeutic starting points, identifying failures earlier in the research cycle when they are relatively inexpensive, and accelerating the delivery of high potential drug candidates to the clinic while reducing cost. In mid-2020 we began transitioning from 'brute-force search' approaches, where we *physically test* every combination of disease model and drug candidate in our library using our automated wet-lab infrastructure, to a more efficient and even more powerful 'inferential search' approach. Under this new paradigm, we independently profile thousands of disease models and hundreds of thousands of drug candidates and then infer tens of billions of biological and chemical relationships *in silico*, prioritizing the most promising candidates for further validation. Ambitious explorations that would have taken us approximately 1,000 years to execute using our current throughput with brute-force search can now be *inferred* in a matter of months. This transition marks early progress towards realizing our founding vision—converging massive biological and chemical datasets and modern machine learning, or ML, algorithms to drive the unbiased discovery of novel therapeutics at a pace and scale beyond what could be studied or explored in the physical world.

Year	2017	2018	2019	2020
Total Phenomic Experiments (Millions)	2.2	7.6	23.9	55.6
Data (PB)	0.5	1.8	4.3	6.8
Cell Types	7	12	25	36
Unique Perturbations[1] (Millions)	0.02	0.1	0.5	1.3
Total Chemical Library (Thousands)	3	24	106	706
Inferential Relationships[2] (Billions)	NA	NA	NA	13
Clinical Assets	0	1	2	4
Cost Per Experiment[3] ($)	0.63	0.45	0.36	0.33

Table 1. The scale and acceleration of our historical growth along multiple axes. We are a biotechnology company scaling more like a technology company, as demonstrated by our super-linear growth in inputs (cell types used in our wet labs) and rapid growth in outputs (data and clinical assets). [1] 'Unique Perturbations' refers to the number of gene, soluble factor, cell, and/or compound combinations physically explored. [2] 'Inferential Relationships' refers to the number of Unique Perturbations that have been predicted using our Recursion Map. [3] 'Cost Per Experiment' refers to the average adjusted direct cost to perform one phenomic experiment (defined as one well per perturbation) and is inclusive of consumable, compound, and labor costs.

We have used the Recursion OS to generate a pipeline of 35 internally developed programs. Our programs target diseases spanning several therapeutic areas where: i) the cause of the disease is well-defined and ii) there is high unmet need, there are no approved therapies, or there are significant shortcomings with existing treatment paradigms. Several of our programs target indications with market opportunities in excess of $1 billion in annual sales and we are preparing four pipeline programs to enter Phase 2 clinical trials in .

Eight of our Notable Programs were discovered using our brute-force search approach:

- REC-4881 for the treatment of familial adenomatous polyposis, or FAP—expected Phase 2 initiation in
- REC-3599 for the treatment of GM2 gangliosidosis, or GM2—expected Phase 2 initiation in
- REC-2282 for the treatment of neurofibromatosis type 2, or NF2—expected Phase 2 initiation in
- REC-994 for the treatment of cerebral cavernous malformation, or CCM—expected Phase 2 initiation in
- Lead molecules for the treatment of *C. difficile* colitis—preclinical
- Lead molecules for the treatment of neuroinflammation—late discovery
- Lead molecules for the treatment of Batten disease—late discovery
- Lead molecules for the treatment of Charcot-Marie-Tooth type 2A disease, or CMT2A—late discovery

Following close behind are two Notable Programs discovered and rapidly advanced using our inferential search approach:

- REC-64151 for the treatment of immune checkpoint resistance in *STK11*-mutant non-small cell lung cancer—preclinical
- MYC inhibitory molecules for the treatment of solid and hematological malignancies—late discovery

In addition to the Notable Programs highlighted above, we are actively exploring 25 additional programs, which may prove to be drivers of our future growth. Using our new inferential search approach, we have discovered and initiated validation of 16 of these programs since July 2020. Moving forward, we expect the vast majority of new additions to our pipeline will be discovered using our inferential search approach.

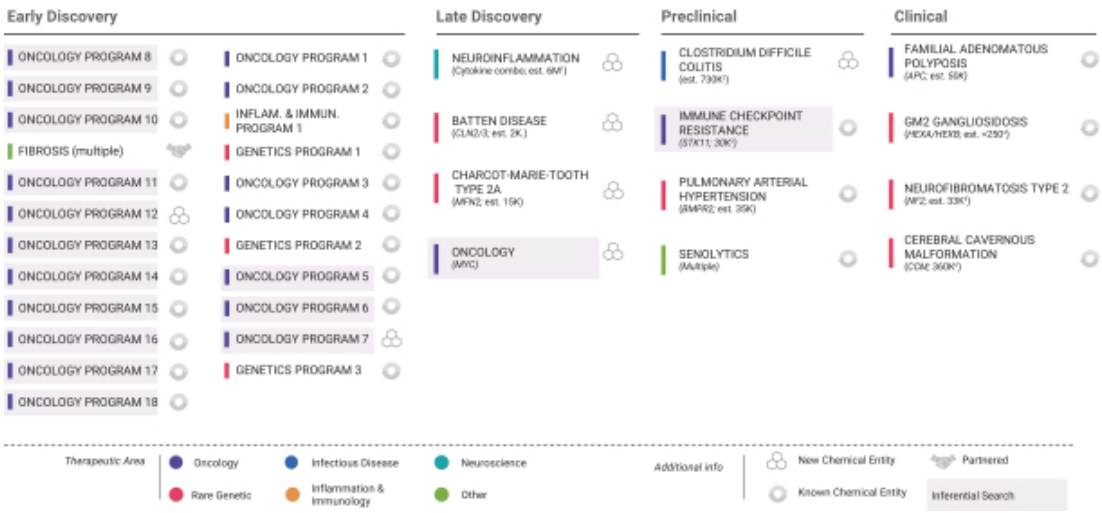


Figure 2. The power of our Recursion OS as exemplified by the breadth of active research and development programs. We have developed a pipeline of 35 internally-developed programs

spanning multiple therapeutic areas and consisting of both new uses for existing compounds and new chemical entities, or NCEs, under active research and development. (1)Our program has the potential to address a number of indications within Neuroinflammation, including multiple neurodegenerative diseases totaling at least 6M patients in the US. We intend to pursue a select subset of these indications in the future. (2)730,000 annual incidence in US-EU5. Initial clinical studies will focus on subsets of the total population with high rates of recurrent infection. (3)Annual US-EU5 incidence (4) Worldwide prevalence (5) Annual US-EU5 incidence for all *NF2*-driven meningiomas (6) Hereditary and sporadic symptomatic population

In its ideal state, a drug discovery funnel would be shaped like the letter 'T' where a broad universe of possible therapeutics could be narrowed immediately to the perfect candidate, which would advance through subsequent steps of the process quickly and with no attrition. Our goal is to leverage technology to reshape the typical drug discovery funnel towards its ideal state by broadening the funnel of potential therapeutic starting points, rapidly narrowing the funnel by identifying failures earlier in the research cycle when they are relatively inexpensive, and accelerating the development of high-potential drug candidates. Late-stage clinical failures are the primary driver of costs in today's pharmaceutical R&D model. Reducing the rate of costly, late-stage failures and accelerating the timeline from hit to clinical candidate would create a more sustainable R&D model.

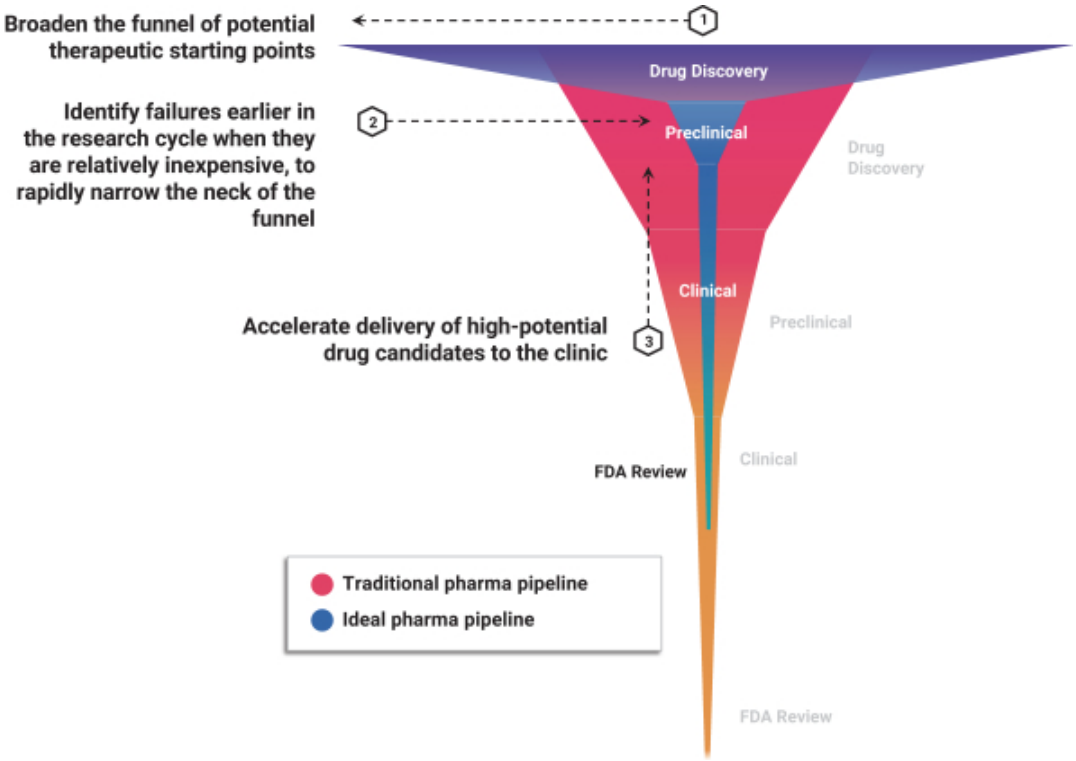


Figure 3. Reshaping the drug discovery funnel. The Recursion OS is reshaping the traditional pharma pipeline into a more ideal funnel. The broad swath of biological and chemical data fed into the platform are quickly triaged and fed into an accelerated translation path into the clinic.

We believe we have made progress in reshaping the traditional drug discovery funnel in the following ways:

- *Broaden the funnel of therapeutic starting points*. Our flexible and scalable infrastructure and our ability to use our *inference-based* Recursion Map to predict tens of billions of relationships between disease models and therapeutic candidates 'widens the neck' of the discovery funnel beyond hypothesized and human-biased targets.
- *Identify failures earlier in the research cycle when they are relatively inexpensive, to rapidly narrow the neck of the funnel.* The Recursion Map combines massive biological and chemical datasets and computational tools that enable us to both i) select more highlytranslatable therapeutic starting points, and ii) predict select absorption, distribution, metabolism, excretion and toxicology, or ADMET, liabilities for drug candidates, rapidly prioritizing those programs with a higher likelihood of downstream success. Notably, this strategy not only results in an increase in early stage attrition but we expect will also result in an overall lower cost of drug development.
- *Accelerate delivery of high-potential drug candidates to the clinic*. The Recursion Map contains a suite of digital chemistry tools that enable highly-efficient exploration of chemical space, including 3D virtual screening as well as translational tools that improve the robustness and utility of *in vivo* studies.

We have leveraged our evolving Recursion OS to explore many disease programs to a depth sufficient to quantify improvements in the time, cost, and anticipated likelihoods of program success by stage compared to the traditional drug discovery paradigm. These metrics are leading indicators that, using our approach, we can industrialize drug discovery. We believe that future iterations of the Recursion OS will enable even greater improvements. Ultimately, we look to minimize the total dollar-weighted failure while maximizing the likelihood of success in the clinic.

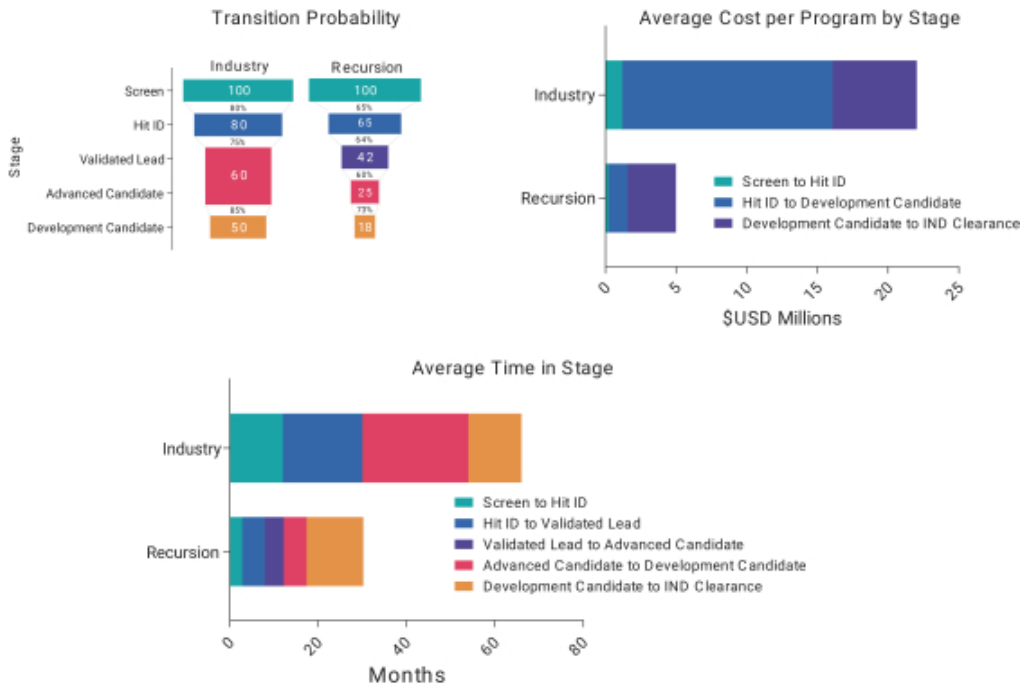


Figure 4. The trajectory of our drug discovery funnel mirrors the 'ideal' pharmaceutical drug discovery funnel. Compared to industry averages, we i) identify low-viability programs earlier in the

research cycle, narrowing the funnel more quickly, ii) spend less per program because of our approach, and iii) advance programs more quickly from program start to the clinic. Data shown are the average of all our programs since late 2017[1].

Over time, we believe continued and improved successes in any or all of the dimensions highlighted above will improve overall R&D productivity, allowing us to address smaller patient populations that may otherwise not be commercially viable using traditional drug discovery approaches. Further, we believe our unbiased approach may lead to novel targets and allow us to outperform others in highly competitive disease areas where multiple parties often simultaneously pursue a limited number of similar target hypotheses. These advantages potentially expand the total addressable market for our technology by a significant amount.

The Recursion OS

The Recursion OS is an integrated, multi-layer system for generating, analyzing, and deriving insight from biological and chemical datasets. It consists of three parts:

- *Infrastructure Layer*: A synchronized network of highly scalable enabling hardware and software used to design and execute diverse biological experiments and subsequently store our ever-growing datasets.
- *The Recursion Data Universe*: As of December 31, 2020, our Recursion Data Universe contained approximately seven petabytes of highly relatable biological and chemical data spanning multiple different data modalities. The size of the Recursion Data Universe has grown more than threefold since 2018 and has continued to grow at an accelerating rate. For context, our dataset already requires more storage capacity than all of the feature-length films in human history in high-definition, combined.

1 All industry data adapted from Paul, et al. *Nature Reviews Drug Discovery*. (2010) 9, 203–214.

- *The Recursion Map*: A suite of in-house software tools, algorithms and machine learning approaches designed to process and translate data from the Recursion Data Universe into actionable insights for our research and development teams.

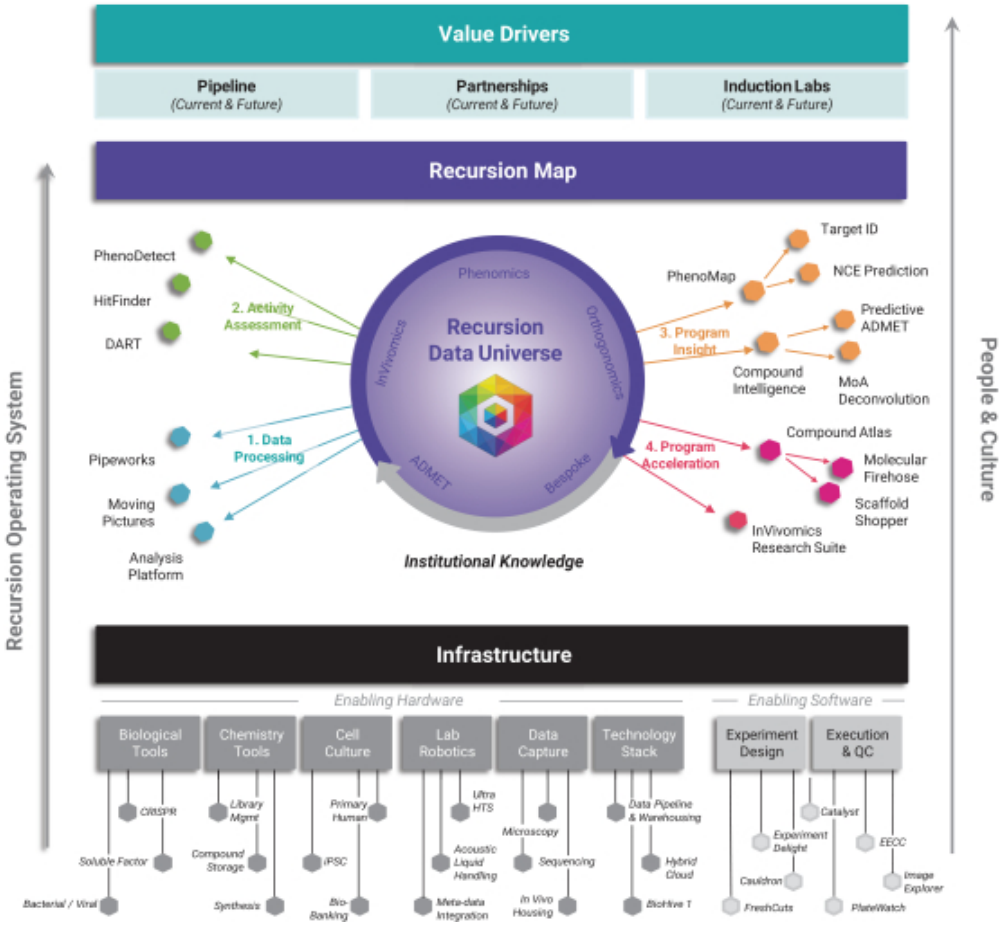


Figure 5. The Recursion OS for industrializing drug discovery (expanded). The Recursion OS is an integrated, multi-faceted system for generating, analyzing, and deriving insight from massive biological and chemical datasets to industrialize drug discovery. It is composed of an Infrastructure Layer of enabling hardware and software, the Recursion Data Universe, which houses our diverse and expansive datasets, and the Recursion Map, a suite of our proprietary discovery, design, and development tools.

The combination of wet-lab biology used to generate our proprietary dataset and *in silico* tools in our closed-loop system sets us apart in the field of tech-enabled drug discovery. Many companies in this space: i) leverage disparate, noisy and often irreproducible third-party datasets, which are poorly suited for ML, or ii) build tools “as a service” for others, which may limit their upside and impact over time. More importantly, our repetition of wet-lab validation and *in silico* predictions creates a flywheel effect, where data generation and learning accelerate side-by-side and further strengthen our drug discovery platform. While emerging competitors and large well-resourced incumbents may pursue a similar strategy, we have two advantages as a first mover: i) no amount of resources can compress the time it takes to

observe naturally occurring biological processes, and ii) the ever-growing Recursion Data Universe creates compounding network effects that may make it difficult to close the competitive gap.

The Infrastructure Layer

The foundational layer of the Recursion OS is a highly synchronized network of enabling hardware and software used to design, execute, aggregate, and store the approximately seven petabytes of rapidly growing biological and chemical data. We built the core elements of our infrastructure based on cutting-edge technology created in the last several years and continue to adopt new technological advancements within each component.

The eight components of our Infrastructure Layer include:

- *Biological Tools.* We leverage the latest biological tools, such as CRISPR gene editing, to build models of human diseases and explore biology at scale. For example, we created an algorithm to custom design an arrayed whole genome CRISPR library used to knock out every gene individually in multiple human cell types.
- *Chemistry Tools.* We have invested in infrastructure to store millions of chemical starting points for drug candidates and rapidly select any molecule or combination of molecules in our facilities for experimentation. Further, we are investing substantially in infrastructure to synthesize and analyze novel chemical entities at scale in-house. We have explored additional modalities, such as antibody, protein, and RNA-based therapeutics, and can rapidly expand our capabilities to support these areas in the future.
- *Cell Culture.* We have invested in state-of-the-art facilities and equipment to culture, store, and utilize massive quantities of diverse human cell types and patient-derived cell lines for discovery and validation experiments. This includes the use of bioreactors, originally pioneered for the cell-therapy industry, to grow dozens of primary human cell types to the scale of many billions of cells and subsequently store them in our biobanking facility.
- *Lab Robotics.* We have created a highly-scalable, automated laboratory robotics workflow that enables us to conduct up to 1.5 million experiments each week for up to 50 weeks per year with only a small team overseeing our processes at any given time. Every step of every experiment is monitored and measured, creating a comprehensive layer of meta-data that is critical for interpretation and analysis in our Recursion Map.
- *Data Capture.* We leverage state-of-the-art hardware to capture high-dimensional, multi-modal biological and chemical data from our experiments. This includes high-throughput microscopes to generate images of human cells, sequencing systems to collect RNA transcript data, and continuous video feeds from cameras embedded in custom animal study cages.
- *Technology Stack.* We have created highly scalable, advanced computational resources enabling us to move, store, process and secure ‘petabyte-scale’ data assets in both public and private cloud environments. A cornerstone of this stack is our state-of-the-art ML supercomputer, BioHive-1, purchased in December 2020, which we believe will be one of the most powerful computers wholly-owned by any single biopharmaceutical company for drug discovery applications and the 66th most advanced supercomputer overall.[2]
- *Experiment Design.* We have built a set of enabling software tools that empower our scientists to design an increasing number of experiments each week while taking into account real-time onsite reagent supplies, consistent control strategies, and design standards that make each week’s data relatable across time.
- *Experiment Execution and Quality Control.* We have invested substantially in a set of enabling software tools to orchestrate the execution of up to 1.5 million experiments each week while simultaneously monitoring quality to maintain a productive flow of data. Anomalies are automatically flagged to the team for resolution.

2 Estimate of placement on TOP500 supercomputer list provided by NVIDIA (supplier).

The Recursion Data Universe

The Recursion Data Universe is our proprietary collection of highly relatable, high-dimensional biological and chemical datasets spanning multiple different data modalities. As of December 31, 2020, the Recursion Data Universe contained approximately seven petabytes of highly relatable biological and chemical data.

Core to the Recursion Data Universe is our proprietary, image-based dataset, which we believe to be among the world's largest and most comprehensive. Each image is the product of our underlying Infrastructure Layer, which is generated by the following automated workflow:

- Using our cell culture infrastructure, we culture billions of cells across dozens of human cell types and cryopreserve them in our biobanking facility.
- Using our Experiment Design software, we are able to design up to 1.5 million experiments each week while maintaining key design and control constraints.
- As needed, we thaw aliquots of cells and add them to 1,536-well assay plates.
- Using diverse biological tools, we model human diseases in these cells, for example, using CRISPR gene editing to knock out human genes or adding disease-causative soluble protein factors.
- In parallel, we may profile hundreds of thousands of chemical starting points from chemistry tools to enable modelling of pharmacological interactions.
- All experimental plates are handled, stored, and maintained by our automated lab robotics infrastructure before being fed into our high-throughput microscopes that capture high-resolution images of the cells.
- Our Experiment Execution and Quality Control Software monitors data quality in real time and moves only validated data into the Recursion Data Universe.

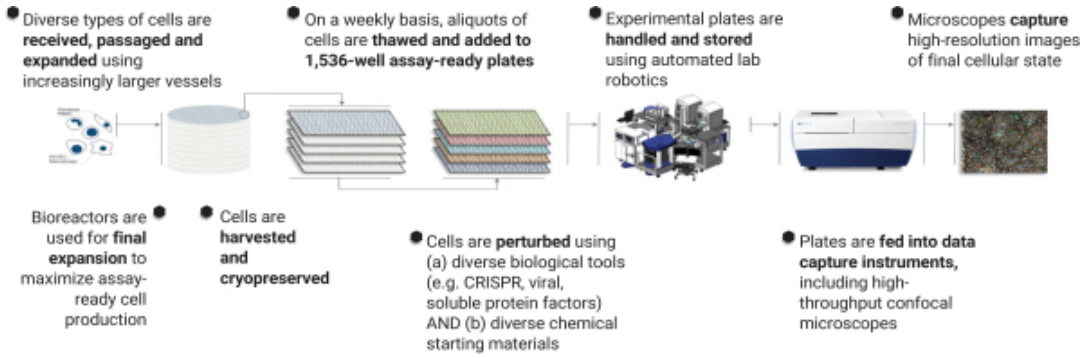


Figure 6. The automated workflow used to generate our large-scale, image-based dataset. The core dataset in the Recursion Data Universe is based on billions of labeled images of human cells generated across millions of unique perturbations (i.e., gene knockout, soluble protein factor addition, drug addition or combinations thereof) generated in our own wet laboratories.

As of December 2020, this process can generate up to nine million images, or approximately 80 terabytes of data, across up to 1.5 million experiments per week. Importantly, meta-data generated in the course of experiments is logged by both automated and manual QC systems to ensure that the data is clean and relatable before being added to the Recursion Data Universe.

Images are the foundational dataset of the Recursion Data Universe for two key reasons. First, images are two-to-four orders of magnitude more data-dense per dollar than other high-dimensional datasets such as transcriptomics or proteomics, both of which we also leverage but at less scale. Second, arguably the greatest advances in neural networks over the last decade have been made in the area of computer vision and image processing. We have leveraged these advancements to create our proprietary, image-based algorithms for drug discovery that we believe are substantially more advanced than those developed using other types of biological data.

Additional datasets within the Recursion Data Universe include:

- *Orthogonomics*. A combination of scaled transcriptomic and proteomic datasets used to validate the activity of compounds identified on our phenomic platform and further elucidate the mechanism by which drug candidates may be working.
- *ADMET Assays*. Large-format absorption, distribution, metabolism, excretion, and toxicology data that enable us to identify and predict early liabilities that frequently lead to program termination.
- *InVivomics*. Sensor data and continuous video feeds from cameras embedded in custom animal study cages. Using this data, we can collect more holistic measurements of animal behavior and create abstract representations of *in vivo* disease states.
- *Bespoke One-Off Assays*. A diverse set of custom assays for program-specific validation.

We plan to continue leveraging our expertise and infrastructure investments to accelerate the generation of the datasets described above and to add complementary new data assets to the Recursion Data Universe over time.

The Recursion Map

The Recursion Map is a rapidly growing suite of in-house software applications designed to process and translate data from the Recursion Data Universe into actionable insights for our research and development teams to accelerate programs. These tools cover a broad set of uses including:

- *Data Processing.* Our tools manage and monitor the streaming of our data to the appropriate public and private cloud at scale, transform our images into mathematical representations through our in-house proprietary convolutional neural networks, and perform standard and custom analyses as parameterized and requested by users.
- *Biological and Chemical Activity Assessment.* Our tools allow us to evaluate the robustness of disease models and measure the activity of potential therapeutics using brute-force search approaches.
- *Program Insight.* Our tools translate processed data into actionable insights, enabling us to infer tens of billions of relationships among biological and chemical perturbations and predict potential safety liabilities.
- *Program Acceleration.* Our digital chemistry tools equip our chemists with valuable information as they optimize therapeutic starting points into viable drug candidates, including tools to conduct *in silico* hit expansions into in-house and commercial libraries based on 3D virtual screens and dense structure activity relationships. These tools also include applications to augment *in vivo* study design and execution.

Modern ML tools, with which much of the Recursion Map is built, learn to identify complex patterns within high-dimensional, multi-factorial data without the need for human oversight. Our ML tools are designed to extract insights from foundational biological datasets that are too complex for human interpretation, minimizing human bias and identifying relationships that traditional drug

discovery approaches may miss. The outcomes of our analyses range from unsurprising, to totally novel, to challenging dogma.

The current and future suite of Recursion Map tools augments our decision making at each step of the drug discovery process and can increasingly predict likely outcomes of subsequent steps. Importantly, these *in silico* predictions are validated in our own wet laboratories. This creates a mutually reinforcing cycle of learning within the Recursion Map. Predictions that validate experimentally, a positive signal, are advanced rapidly and reinforce our learning. Predictions that do not validate experimentally, a negative signal, generate valuable data that test our understanding and can be used to retrain or reweight the algorithms to improve future predictions. This iterative process of prediction and validation is a key element of successful ML over complex datasets.

Our People and Culture

We operate at the intersection and cutting-edge of science and technology. Unlike traditional biotechnology companies, our rapidly growing team of more than 200 Recursionauts is balanced between life scientists such as chemists and biologists (approximately 40% of employees) and computational and technical experts such as data scientists and software engineers (approximately 35% of employees), creating an environment where empirical data, statistical rigor, and creative thinking is brought to bear on the problems we address. While we are united in a common mission, *Decoding Biology to Radically Improve Lives*, our greatest strength lies in our differences: expertise, gender, race, disciplines, experience and perspectives. Deliberately building and cultivating this culture is critical to achieving our audacious goals.

Our Value Drivers

We have used the Recursion OS to build three value drivers thus far: i) a pipeline of 35 internally-developed programs focused on areas of significant unmet need, several of which have market opportunities in excess of $1 billion in annual sales, ii) strategic partnerships with leading biopharmaceutical companies, and iii) Induction Labs, a growth engine created to explore new extensions of the Recursion OS both within and beyond therapeutics.

Our Pipeline

Every program at Recursion is a product of our Recursion OS. While we have 35 programs in our pipeline, we highlight ten 'Notable Programs' that are key, near-term value drivers given their individual market opportunities and the validation they provide for each generation of the Recursion OS.

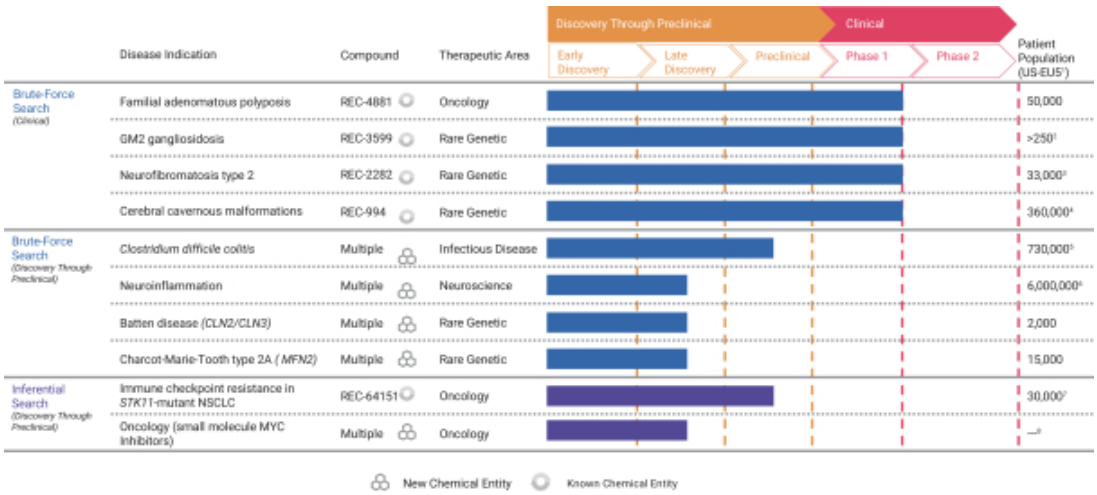


Figure 7. Notable Programs within the broader Recursion pipeline. Notable Programs are key, near-term value drivers for us given their market opportunities and the validation that they provide. Our four lead programs are expected to enroll patients in Phase 2 clinical trials in 2021 while preclinical programs are progressing. (1)EU5 is defined as France, Germany, Italy, Spain and the United Kingdom. All numbers are prevalence unless otherwise noted. (2)Worldwide prevalence. (3)Annual US-EU5 incidence for all NF2-driven meningiomas. (4)Hereditary and sporadic symptomatic population. (5)730,000 annual incidence in US-EU5. Initial clinical studies will focus on subsets of the total population with high rates of recurrent infection. (6)Our program has the potential to address a number of indications within Neuroinflammation, including multiple neurodegenerative diseases totaling at least 6 million patients in the US. We intend to pursue a select subset of these indications in the future. (7)Annual US-EU5 incidence. (8)Our program has the potential to address a number of indications driven by *MYC* alterations. At this time, we have not finalized a target product profile for a specific indication.

Brute-Force Search Programs

Eight of our Notable Programs were identified using our brute-force search approach. Four of these programs are new uses of existing known chemical entities, or KCEs, that we have advanced to clinical development and for which we have obtained key enabling licenses. Another four of these programs are new chemical entities, or NCEs, that have been discovered and advanced in-house.

- ***REC-4881 for the Treatment of FAP***. REC-4881 is an orally bioavailable, non-ATP-competitive allosteric small molecule inhibitor of MEK1 and MEK2 being developed to reduce tumor size in familial adenomatous polyposis (FAP) patients and patients with somatic *APC*-mutant tumors. REC-4881 appears to be well tolerated, consistent with the intended use and a gut-localized PK profile in humans that is highly advantageous for FAP and potentially other tumors of the gastrointestinal tract. We expect to enroll the first patient in a Phase 2, double-blind, randomized, placebo-controlled trial in .

- ***REC-3599 for the Treatment of GM2 Gangliosidosis***. REC-3599 is an orally bioavailable, selective, potent small molecule inhibitor of protein kinase C, or PKC, and GSK3-b being developed for the treatment of GM2 gangliosidosis, or GM2. This molecule has demonstrated strong rescue of pathogenic biomarkers GM2 and lipofuscin levels in cells derived from patients with multiple different mutations in either *HEXA* or *HEXB*, referred to as Tay-Sachs or Sandhoff Disease, respectively. We are currently generating additional pharmacodynamic data in an animal model of *HEXB-mutated GM2* at the request of the FDA in anticipation of enrolling the first patient in an open-label Phase 2 trial in .
- ***REC-2282 for the Treatment of NF2***. REC-2282 is a CNS-penetrant, orally bioavailable, small molecule HDAC inhibitor being developed for the treatment of *NF2*-driven meningioma and neurofibromatosis type 2, or NF2. This molecule has been well tolerated, including in patients dosed for multiple years, and potentially has reduced cardiac toxicity that would differentiate it from other histone deacetylase, or HDAC, inhibitors. In contrast to approved HDAC inhibitors, REC-2282 is both CNS-penetrant and orally bioavailable. We expect to enroll the first patient in a Phase 2, double-blind, randomized, placebo-controlled study in .
- ***REC-994 for the Treatment of CCM***. REC-994 is an orally bioavailable, superoxide, scavenger small molecule being developed for the treatment of cerebral cavernous malformation, or CCM. In Phase 1 single-ascending dose, or SAD, and multiple-ascending dose, or MAD, trials in healthy volunteers that we conducted, REC-994 demonstrated excellent tolerability and suitability for chronic dosing. CCM is among the largest rare disease opportunities with approximately 360,000 symptomatic patients in the United States and EU5, and no approved therapies. We expect to enroll the first patient in a Phase 2, double-blind, placebo-controlled, safety, tolerability, and exploratory efficacy study in .
- ***Lead Molecules for the Treatment of C. difficile Colitis***. We have identified three lead NCEs (REC-163964, REC-164014, and REC-164067) with the potential to be orally active, gut-biased, small molecule *C. difficile* toxin inhibitors, which we have shown to be inhibitors of glucosyl transferase. These molecules have the potential to prevent recurrent disease and be used as secondary prophylaxis therapy in high risk patients with *C. difficile* infections, the leading cause of antibiotic-associated diarrhea and a major cause of morbidity and mortality. We are currently completing exploratory non-clinical safety studies to enable selection of a development candidate.
- ***Lead Molecules for the Treatment of Neuroinflammation***. We have identified three lead NCEs (REC-648455, REC-648597, and REC-648677) with the potential to be first-in-disease, orally bioavailable, safe, CNS-penetrant, small molecule modulators of microglial activation. Microglial activation and neuroinflammation are hallmarks of neurodegenerative diseases such as Alzheimer's Disease and Parkinson's Disease, and CNS inflammatory diseases such as Multiple Sclerosis. Small molecule modulators of microglial activation have the potential to reduce neuronal death associated with proinflammatory processes in neurodegenerative diseases and inflammatory diseases of the CNS. The project is in lead optimization.
- ***Lead Molecules for the Treatment of Batten Disease***. We have identified three lead NCEs (REC-648190, REC-259618, and REC-648647) with the potential to be orally bioavailable, CNS-penetrant, disease modifying therapeutics for multiple subtypes of Batten disease. Batten disease is an autosomal recessive, neurodegenerative disease resulting from mutations in one of fourteen *CLN* genes. While rare, these disorders collectively represent the most prevalent pediatric neurodegenerative disease and demonstrate significant unmet need. This project is currently in lead optimization.

- ***Lead Molecules for the Treatment of CMT2A***. We have identified four lead molecules (REC-64810, REC-648458, REC-1262, and REC-150357) with the potential to be first-in-disease, orally bioavailable, disease modifying molecules to slow or reverse the progression of the mitochondrial disease Charcot-Marie-Tooth type 2A, or CMT2A. CMT2A is a rare, autosomal dominant, peripheral nerve degenerative disease caused by mutations in the *MFN2* gene which leads to progressive muscle atrophy in the lower legs and hands. There are no approved disease modifying therapies for CMT2A. This project is currently in lead optimization.

Inferential Search Programs

Two of our Notable Programs were identified since mid-2020 using our inferential search approach. One of these programs is a new use of an existing KCE while the other is an NCE discovered and advanced in-house.

- ***REC-64151 for the Treatment of Immune Checkpoint Resistance in STK11-mutant NSCLC***. We have identified a novel use for a clinical-stage, orally bioavailable small molecule to restore and improve sensitivity to immune checkpoint inhibitors in tumors harboring mutations in the tumor suppressor gene *STK11*. There are approximately 30,000 cases of *STK11* mutant metastatic non-small cell lung cancer, or NSCLC, per year in the US and EU5, and these mutations have been shown to predict poor prognosis and resistance to immune checkpoint inhibitors, or ICI, specifically anti-PD-(L)1 therapies. There are currently no approved therapies developed to specifically modulate tumor response in *STK11* mutant cancers. This program is currently in the dose-optimization phase.
- ***MYC Inhibitory Molecules for the Treatment of Solid and Hematological Malignancies.*** We have identified multiple hit series using our inferential-search approach that have subsequently shown concentration-dependent activity in suppressing transcriptional activity downstream of MYC. Increased expression of MYC transcriptional target genes presents across oncology and up to 50% of cancers harbor alterations in *MYC*. Novel small molecules with the potential to suppress MYC-dependent activity could improve treatment of diverse tumors, especially those harboring mutations in genes directly implicated in MYC activation. There are currently no approved molecules that target MYC specifically. This program is currently in the hit-to-lead phase.

In addition to the Notable Programs highlighted above, we have discovered 25 additional compounds, which may prove to be drivers of our future growth. Using our inferential search approach, we have discovered and validated 16 of these programs since July 2020. Moving forward, we expect the vast majority of new additions to our pipeline will be discovered using our inferential search approach.

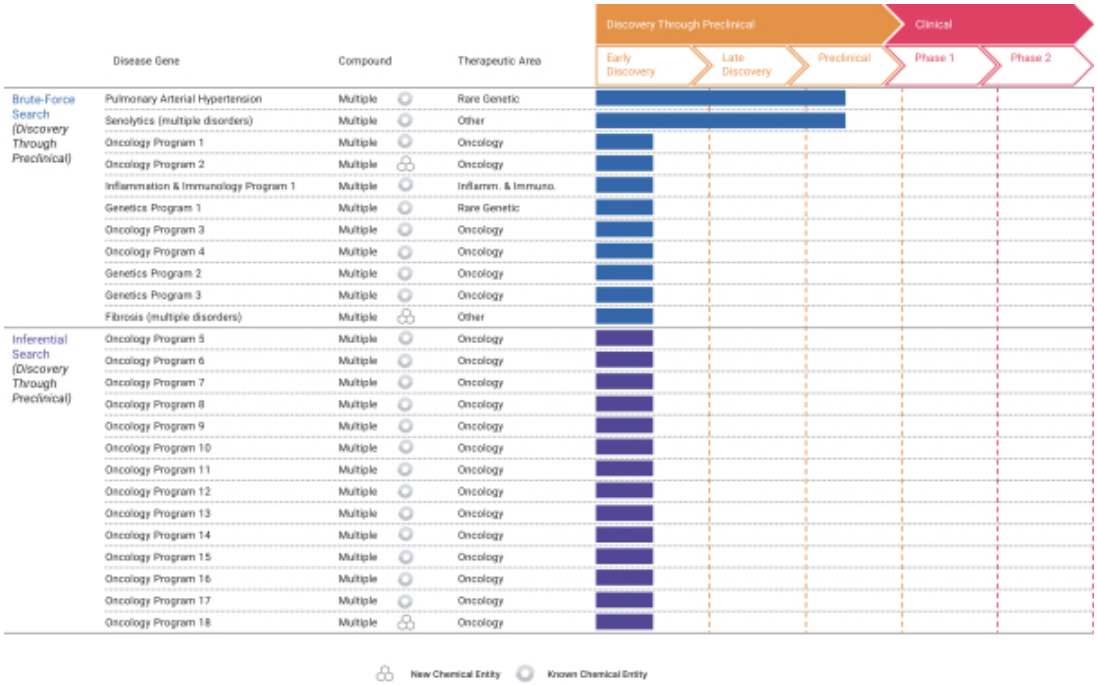


Figure 8. Our large and diverse set of additional research programs. Additional programs in active development cover a number of therapeutic areas, from cancer to inflammation to rare genetic disorders. All of these programs were discovered and developed using our Recursion OS.

Our Partnerships

We are not alone in our mission to industrialize drug discovery and improve patient lives. Using our Recursion OS, we have and will continue to collaborate with leading biopharmaceutical companies that have the resources and experience to help us broadly explore diverse disease domains (e.g., fibrosis, neuroscience, oncology, immunology, and inflammation) and rapidly identify first-in-class and best-in-class therapeutic candidates.

In August 2020, we entered into a multi-year, strategic partnership with Bayer AG, or Bayer, in the area of fibrosis. Under the collaboration, the parties agreed to initiate more than 10 discovery projects over a five-year period to identify novel therapeutics for devastating and complex fibrotic diseases across multiple organ systems—including lung, liver, and heart. Bayer contributed approximately 500,000 compounds from its proprietary library and will contribute deep scientific expertise throughout the collaboration.

While our partnerships to date have focused on small molecule research, future partnerships may extend into large molecules and novel therapeutic modalities including gene therapies and cell therapies.

Our Strategy for Value Creation

We are a biotechnology company scaling more like a technology company. The near to medium-term elements of our business strategy align with our three key value-drivers. We intend to:

Develop the Current Pipeline of Assets While Delivering Super-Linear Pipeline Growth.

- Rapidly advance our Notable Products through development and potential regulatory submission.
- Super-linearly expand and advance our pipeline.
- Mitigate portfolio risk through therapeutic and mechanistic diversification and select asset partnerships.
- Demonstrate that our time and costs at each stage of discovery and development are lower than industry averages.
- Demonstrate that the level of technical success for our clinical programs is greater than industry average.
- Continue growing the Recursion Data Universe and improve the Recursion Map as we believe that the assets that will drive the most value for Recursion and society are those still to come.

Execute On Strategic Partnerships to Maximize the Potential Value of Our Platform.

- Execute partnerships with industry-leading companies addressing broad therapeutic areas or additional therapeutic modalities, such as large molecules or RNA therapeutics, where we can leverage our tools and our partners' expertise and resources to advance programs rapidly.
- Deliver on our strategic partnership with Bayer in the field of fibrosis.

Explore New Extensions and Business Opportunities Arising from the Recursion Map Through Induction Labs.

- Maximize the value of existing and planned investments in infrastructure, tools and people by exploring tangential business verticals (e.g., additional therapeutic modalities, diagnostics, finance, agriculture, and veterinary medicine).

If we are successful in our pursuit to industrialize drug discovery, we may have the opportunity to pioneer how and where value is allocated within the biopharmaceutical industry by i) commanding more value while partnering programs much earlier in the discovery and development process, ii) addressing disease areas of high unmet need that are otherwise considered too small or unprofitable for traditional drug development, and iii) competing on innovation and speed-to-market in major therapeutic areas, commanding a leadership position. We believe that success in these endeavors may lead to a lasting, positive, and transformative impact on patients' lives and the biopharmaceutical industry as a whole.

The Digital Biology Opportunity

Drug Discovery of the Past and Present

The traditional drug discovery and development process is characterized by substantial financial risks, with increasing and long-term capital outlays for development programs that often fail to reach patients as marketed products. Historically, it has taken over ten years and an average capitalized R&D cost of approximately $2 billion per approved medicine to move a drug discovery project from early discovery to an approved therapeutic. Such productivity outcomes have culminated in an industry success rate of 8% to 14% from discovery to commercialization, yielding a rapidly declining IRR for the industry, from 10% in 2010 to 2% in 2019.[3-7]

Historical Biopharma R&D Metrics

	Success rate	Time (years)	Capitalized R&D spend per approval
Drug Discovery	35%	4.5	$881-$1,098
Preclinical	69%	1	
Clinical & FDA Review	8-14%	8-11	$954-$1,460
Overall	<4%	~14	$1,778-$2,558

Figure 9. Historical biopharmaceutical industry R&D metrics. The primary driver of the cost to discover and develop a new medicine is clinical failure. Less than 4% of drug discovery programs that are initiated result in an approved therapeutic, resulting in a risk-adjusted cost per new drug launched of between $1.8 and $2.6 billion[3-7]

These sobering metrics point to the need for a more efficient drug discovery process. Traditional drug discovery relies on basic research discoveries from the scientific community for disease relevant pathways and targets to interrogate. Historically, the extent of biology's complexity has forced the industry to rely on reductionist hypotheses of the critical drivers of complex diseases, which can create a 'herd mentality' as multiple parties chase a limited number of therapeutic targets, aggravated by normal human bias (e.g., confirmation bias and sunk-cost fallacy). Accentuating this problem, the sequential nature of current drug discovery activities results in long timelines to discharge the scientific risk of such hypotheses and costly late-stage clinical failures.

(3) Alacrita Consulting. Pharmaceutical Probability of Success. (2018)
(4) Deloitte. Ten years on: Measuring the return from pharmaceutical innovation (2019)
(5) DiMasi et al. Innovation in the pharmaceutical industry: New estimates of R&D costs. Journal of Health Economics. 47:20-33 (2016)
(6) Paul, et al. How to improve R&D productivity: the pharmaceutical industry's grand challenge. Nature Reviews Drug Discovery. 9: 203-214 (2010)
(7) Martin et al. Clinical trial cycle times continue to increase despite industry efforts. Nature Reviews Drug Discovery. 16:157 (2017)

Contemporaneously, technological innovations, such as ML, have transformed many industries by enabling efficiency and scale. The biopharmaceutical sector, however, has been slow to embrace such innovations except in very narrow areas. The result is that despite decades of accumulated knowledge, drug discovery can become almost artisanal, creating a major, albeit unintentional, hurdle for innovation. We are filling this innovation gap by building a new type of drug discovery engine, reengineering the end-to-end process from the ground up using technological advances that have become accessible within the past decade.

Our Radical New Approach to Drug Discovery

The emergence of radical technological innovations has created the opportunity to envision new approaches to discovering therapeutics at scale. We are pioneering the integration of these technological innovations across biology, chemistry, automation, data science, and engineering to bring about a complete modernization of drug discovery and development. Combining advances in high content microscopy with arrayed CRISPR genome editing techniques, we can rigorously generate massive, high-dimensional biological and chemical datasets to probe genome-scale biological contexts in multiple human cellular conditions, giving rise to the Recursion Data Universe. Simultaneously, exponential improvements in compute speed and reductions in data storage costs driven by the technology industry, married with ML tools to make sense of complex data, enable us to efficiently harness these massive datasets and perform unbiased inquiry of causative human biology, unconstrained by presumptive hypotheses. We believe this will enable us to derive novel biological insights previously inaccessible to scientific researchers and reduce translational risk at program outset. For example, given any gene of interest, our platform reveals its relationship to all genes and molecules included in the Recursion Data Universe, vastly expanding the scope of surveyable biology and combining novel, basic science and therapeutic discovery into a single step.

Recursion: A Biotechnology Company Scaling More Like a Technology Company

Technology companies generate reliable software that automates and improves manual and bespoke processes to bring value to customers at lower unit costs. The introduction of ML into these applications enables machines to learn from data and perform complex tasks beyond human abilities.

Traditional approaches to drug discovery typically begin with a specific indication and a human-derived target hypothesis. Bespoke assays are subsequently built, and data generated, to identify therapeutic candidates against the proposed target. In contrast, we empirically generate large datasets encompassing a broad range of indications, with data across hundreds of thousands of biological and chemical perturbations. We combine this data within our Recursion Data Universe, with the proprietary suite of advanced computational tools in our Recursion Map, to initiate and advance new therapeutic programs. Mutually reinforcing advances in ML algorithms and an ever-growing body of knowledge through continuous data generation create a flywheel of novel insights, increasing the efficiency and output of our pipeline.

With one of the largest biological and chemical datasets at approximately seven petabytes which is growing by up to 1.5 million experiments' worth of data each week *and* a suite of software applications within the Recursion Map, we are well positioned to automate and accelerate basic science and drug discovery tasks to enable scientific teams to quickly and iteratively evaluate therapeutic candidates. Cumulatively, these advances may redefine R&D productivity, as technology has disrupted many other industries, and we believe they will generate forward program growth as they have led to forward revenue growth in the context of technology companies.

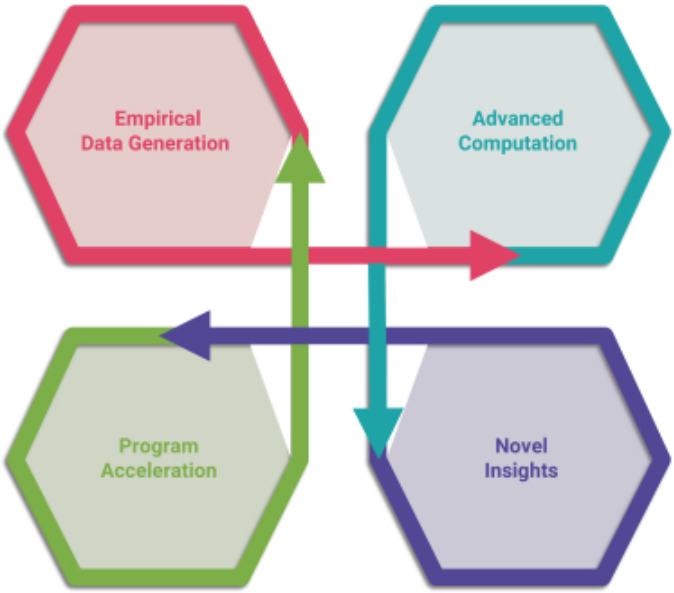


Figure 10. Our integrated approach creates a closed-loop, virtuous cycle of iterative learning. The combination of our proprietary data generation, the Recursion Data Universe, and advanced computational tools, the Recursion Map, enables us to generate novel insights to initiate or accelerate therapeutic programs. We iterate on this approach to create a virtuous cycle of learning within our system and progress programs at each stage of discovery and development.

By applying the Recursion OS to drug discovery, Recursion expects to turn drug discovery from sequential trial-and-error into a search problem.

The Recursion OS

The Recursion OS is an integrated, multi-layer system for generating, analyzing, and deriving insights from biological and chemical datasets. It consists of three parts:

- ***Infrastructure Layer****:* A synchronized network of highly scalable enabling hardware and software used to design and execute diverse biological experiments and subsequently store our ever-growing datasets.
- ***The Recursion Data Universe****:* As of December 31, 2020, approximately seven petabytes of highly relatable biological and chemical data spanning phenomics, orthogonomics, InVivomics, and bespoke bioassay data.
- ***The Recursion Map****:* A suite of in-house software tools, algorithms and machine learning approaches designed to process and translate data from the Recursion Data Universe into actionable insights for our research and development teams.

- ***The Recursion Data Universe***. Approximately seven petabytes of highly-relatable accumulated biological and chemical data spanning phenomics, orthogonomics, InVivomics, and bespoke bioassay data.

The combination of wet-lab biology used to generate our proprietary dataset and *in silico* tools in our closed-loop system sets us apart in the field of tech-enabled drug discovery. Many companies in this space may: i) leverage disparate, noisy, and often irreproducible third-party datasets, which are poorly suited for ML, or ii) build tools "as a service" for others, which may limit their upside and impact over time. More importantly, our repetition of wet-lab validation and *in silico* predictions creates a flywheel effect, where data generation and learning accelerate side-by-side and further strengthen our drug discovery platform. While emerging competitors and large well-resourced incumbents may pursue a similar strategy, we have two advantages as a first mover: i) no amount of resources can compress the time it takes to observe naturally-occurring biological processes, and ii) the ever-growing Recursion Data Universe creates compounding network effects that may make it difficult to close the competitive gap.

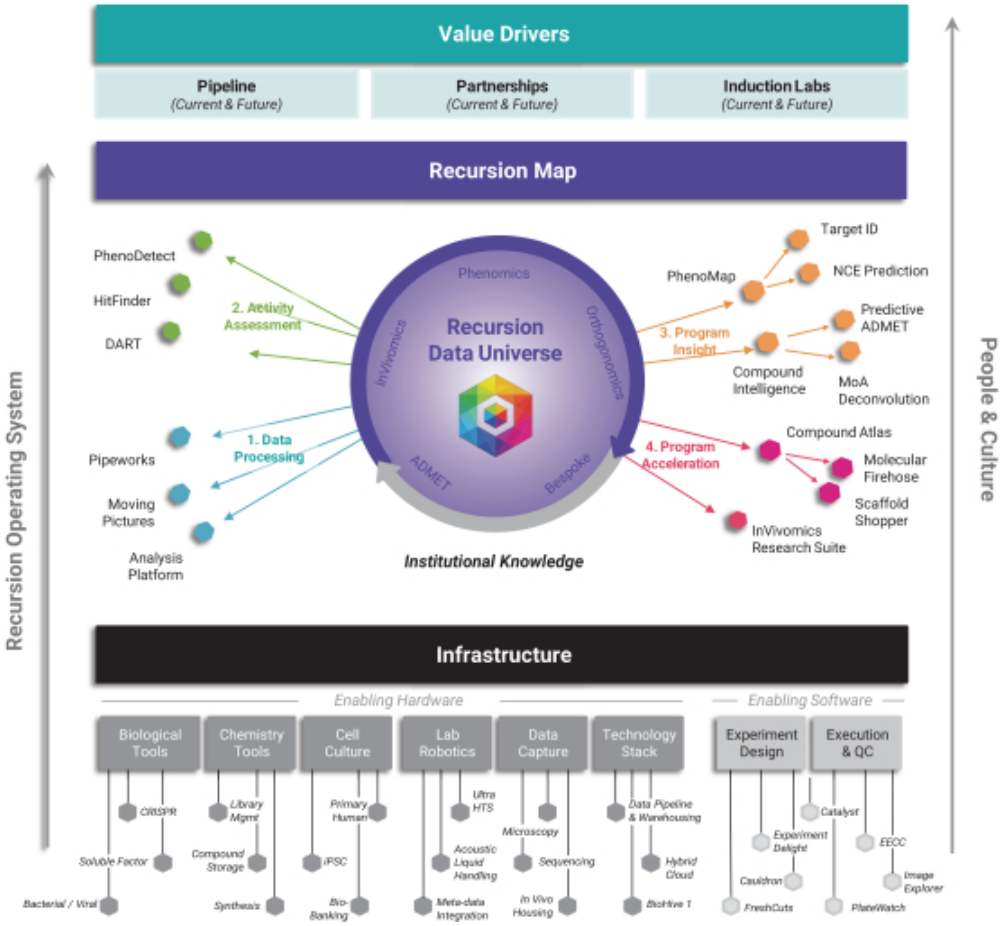


Figure 11. The Recursion OS for drug discovery (expanded). The Recursion OS is an integrated, multi-faceted system for generating, analyzing, and deriving insight from massive biological and chemical datasets to industrialize drug discovery. It is composed of an Infrastructure Layer of enabling hardware and software, the Recursion Data Universe, which houses our diverse and expansive

datasets, and the Recursion Map, a suite of our proprietary discovery, design, and development tools.

The Infrastructure Layer

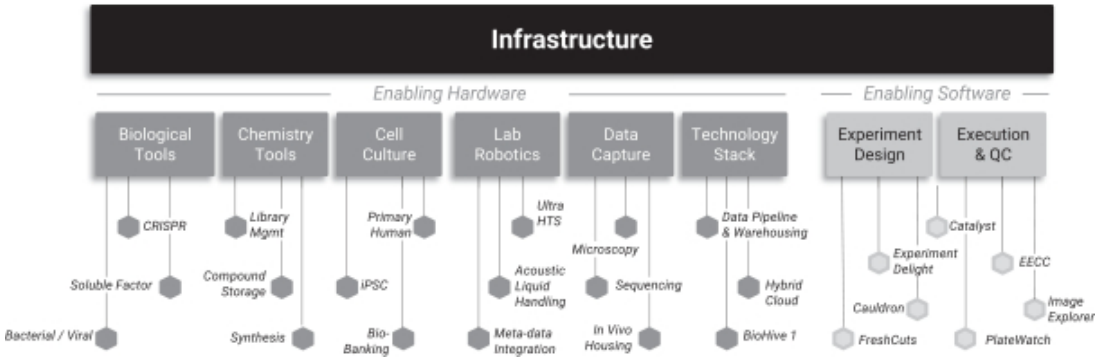


Figure 12. The Infrastructure Layer generates the proprietary data within our massive Recursion Data Universe. The Infrastructure Layer is the backbone upon which the Recursion OS operates and comprises diverse and highly advanced enabling hardware (dark grey) and software systems (light grey) working in concert.

The foundational layer of the Recursion OS is a highly-synchronized network of enabling hardware and software used to design, execute, aggregate, and store the approximately seven petabytes of rapidly growing biological and chemical data. Discrete components of this layer include the following:

Biological Tools

We deliberately designed our platform to model a wide range of biology spanning multiple therapeutic areas, including oncology, immunology, neuroscience, cardiovascular, metabolic, and infectious diseases using the same, image-based endpoint and core technology stack. Our modular design enables us to systematically expand our search space into new areas of exploration while minimizing the need for bespoke assay development. In subsequent steps of our process, our modular design and consistent protocol enables us to analyze and compare the resulting data *across* these modules, revealing the interconnectedness of human biology and tractable therapeutic starting points.

Genetics Module. We have developed our proprietary protocols using CRISPR gene editing to model gene deficiency of every gene in the human genome in an arrayed and high-throughput format. We have iterated on the design of these CRISPR reagents, see FreshCuts in the Recursion Map for detail, and created our proprietary, whole-genome arrayed guide RNA library known as the N-Assay-Ready Whole-genome Human Arrayed Library, or NARWHAL. We continue to build new extensions of these tools to broaden our genetic toolbox, including gain-of-function and novel CRISPR gene editing applications. Collectively, these tools enable us to broadly interrogate human genetics, ranging from Mendelian genetic diseases to precision therapeutics targeting tumor suppressor biology.

Soluble Factor Module. We have developed our proprietary protocols using soluble factors such as cytokines and chemokines underlying a broad range of immune-related diseases. Using these approaches, we can readily combine multiple soluble factors within the same experiment to model more complex disease biology, such as cocktails associated with macrophage polarization states or cytokine storm. Our immune modulation tools enable us to interrogate challenging and poorly understood areas such as neuroimmunology, inflammasome biology, and immuno-oncology.

Infectious Disease Module. We have developed our proprietary protocols using diverse biological pathogens driving a broad range of infectious diseases. For example, we used different

toxins produced by *C. difficile* bacteria to model the disease and subsequently identified lead molecules for our late-stage preclinical *C. difficile* colitis program. In the first half of 2020, we used the live SARS-CoV-2 virus to establish a disease model, set up an end-to-end screening protocol, and test 1,670 FDA-approved and reference compounds for efficacy against COVID-19 in less than 4 weeks. We routinely use agents involved in the innate immune response (e.g., LPS, cyclic dinucleotides, etc.) to generate additional models relevant to infectious disease research. This module enables us to broadly explore infectious disease biology and identify therapeutics working against both pathogen- and host-directed targets.

Fibrosis Module. We are developing our proprietary models and protocols in partnership with Bayer to study fibrotic diseases, including cell co-culture systems. Our emerging tools enable us to tackle this complex disease space where traditional, target-based approaches have proven challenging.

Complex Multicellular Disease Tools. We are developing and expanding the use of advanced co-culture models to explore multifactorial diseases where cell-cell crosstalk is a critical driver of the disease states. These approaches are particularly relevant in immunology, where regulation between adaptive immune cells (i.e., T cells, B cells) and innate immune cells (i.e., monocytes, macrophages) is critical to understanding the full breadth of immunological responses.

Patient-Derived Tools. We are actively developing new techniques to improve the translatability and speed at which we validate and translate early discoveries. We are actively sourcing patient cells (more than 300 individual lines across more than 60 diseases sourced to-date), reprogramming them to induced pluripotent stem cells, or iPSCs, and banking the resulting lines so that we can rapidly differentiate these cells into multiple tissue-specific states for downstream validation when needed. We plan to scale these efforts by an order of magnitude or more in the next 18 months.

We continue to build out additional biology tools and modules to further expand our search space, while maintaining a common, image-based endpoint to reduce complexity, increase flexibility, and ensure the relatability of our ever-growing Data Universe. Over time, we plan to introduce additional variables such as variable imaging time points, 3D models, and tissue-specific organoids that move our screens ever closer to human systems biology.

Chemistry Tools

Our in-house chemistry tools include physical compound collections, state-of-the-art compound storage and handling infrastructure, and high-precision analytical equipment. Our experienced team of chemists use this equipment, and a network of reputable CROs, to rapidly advance discovery efforts and deliver differentiated drug candidates.

Known Chemical Entity Library. One component of our strategy is to identify new uses for existing preclinical and clinical, but not marketed, small molecules. These compounds often have existing data packages that we can leverage to rapidly initiate new clinical studies, accelerating the path to patients and simultaneously increasing program returns. Such molecules are particularly attractive candidates for rare disease indications thanks to the Orphan Drug Act, which provides additional industry incentives and protections for rare disease programs, which may otherwise have too many hurdles to garner commercial interest. Additionally, these molecules typically have well-understood mechanisms of action, or MoA, which, using our tools within our Recursion Map, we can use to uncover the MoA for unknown compounds or launch new NCE discovery efforts.

To this end, we have curated one of the most comprehensive KCE libraries in the world, currently comprised of over 6,000 compounds covering approximately 2,500 unique mechanisms. We actively

add new molecules to this library as they are disclosed in public forums or filings, synthesizing molecules that are not commercially available. Our pharmaceutical partners may also contribute compounds to this library, further expanding its size and chemical diversity.

NCE Starting Point Library. In addition, we have access to over 700,000 small molecule starting points from a combination of commercial, semi-proprietary, and proprietary sources and use this library to identify new chemical starting points for small molecule discovery campaigns. Approximately 200,000 of these compounds reside within our NCE library, curated by our medicinal chemists and designed for highly druggable chemical properties while avoiding undesirable chemical properties, such as poor solubility and permeability. While this library has been constructed to maximize chemical diversity, we have ensured that several analogs of many compound cores are included to help identify emergent structure activity relationships for early hits and enable rapid hit expansion into readily available analogs. Under our strategic partnership with Bayer, we received an additional 500,000 small molecule starting points and use these combined libraries as the starting substrate for our fibrosis collaboration.

Using our foundational 'brute-force' approaches, screening increasingly larger chemical libraries across all disease models would necessitate an exponential increase in platform throughput. As we transition to 'inference-based' discovery approaches, we can onboard and profile far larger compound libraries in multiple cellular contexts with only incremental increases in bandwidth, an important advantage of the Recursion OS. As such, we plan to substantially increase the size and diversity of our NCE library over the coming years through a combination of internal investment and partnerships as well as nascent plans to explore automated microsynthesis systems within Induction Lab. We believe we have the potential to meet or surpass the scale of large pharmaceutical companies that have between approximately 1.4 and 4 million compounds.

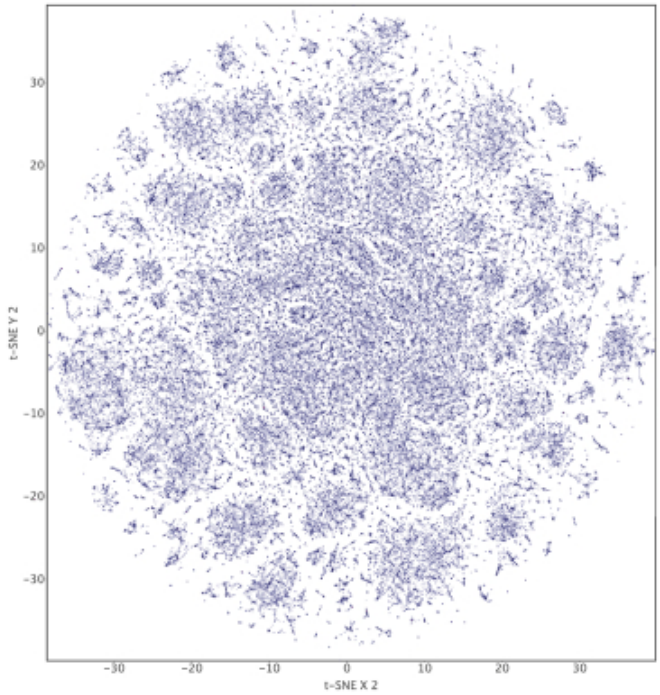


Figure 13. Our internal chemical libraries are highly diverse. This visualization of the structural diversity of approximately 200,000 compounds from our small molecule NCE library, where

compounds are clustered based on descriptors using t-distributed stochastic neighbor embedding, demonstrates the evenly distributed and diverse nature of our compounds. This diversity increases the probability that we capture useful biochemical interactions across a broad range of biology.

Mass Compound Storage & Handling. We have invested in sophisticated compound management infrastructure that allows for the environmentally controlled (temperature and humidity) storage of over one million compounds in tubes and plates. Environmental controls are critical to maintaining the long-term stability of our chemical libraries, and in-house quality control procedures are in place to monitor the libraries over time. The storage system is also rapidly expandable for future growth. Our system enables rapid creation of purpose-built and custom libraries from our existing compound inventory. In addition, automated pipetting systems are in place to consistently aliquot and dilute these compounds into a variety of configurations for experimentation. All key events and lab data are tracked in our laboratory information management software, which integrates with experiment design and scheduling software, enabling accurate and seamless information tracking for our experiments.

Medicinal Chemistry/CMC Outsourcing. Our internal team of experienced medicinal chemists execute all drug design activities in-house but outsource drug synthesis and select ADMET assays to a network of reputable CROs with whom we have built well-established relationships. External CROs provide easily scalable and project-specific resource flexibility, access to diverse chemistry expertise, and rapid turnaround as we iterate on SAR. As of January 2021, we had over 50 full-time equivalents, or FTEs, across multiple vendors working to expand the KCE library and advance six programs at various stages, with plans in place to increase the number of FTEs by an additional 65 in the first quarter of 2021. As programs advance into more advanced preclinical stages where synthesis at scale is of higher priority, our medicinal chemists work ever-closer with our CROs and internal CMC group to craft detailed material plans for preclinical, IND-enabling and clinical supplies.

Analytical and Bioanalytical Chemistry. We have built an analytical laboratory equipped with state-of-the-art liquid chromatography-mass spectrometry equipment. Our lab performs analytical work to assess compound purity and identification for quality controls, bioanalytical work measuring compound levels in plasma and tissue samples from *in vivo* ADME and efficacy studies, and plasma protein binding and permeability studies. Furthermore, this team carries out biomarker identification and validation activities in support of preclinical and clinical translational efforts.

Figure 14. Our expandable and automated compound storage and handling system enables flexibility and speed. Our system allows us to safely and reliably store more than one million chemical compounds in plates or tubes and rapidly create purpose-built custom libraries. This system is one of many highly-automated components within our Infrastructure Layer and integrates with experiment design and scheduling software to minimize errors.

Cell Culture

We have built a state-of-the-art cell culture facility to consistently produce high-quality, mammalian cells, such as vein, kidney, lung, liver, skin, and blood cell subsets, that go into each experiment run on our platform and in subsequent validation. We utilize a toolbox of *in vitro* cell culture techniques to scale production while driving down costs. This includes the graduated use of small scale flasks, with a 25 cm^2 growth surface area, to large-scale, single-use bioreactors, with a 375,000 cm^2 growth surface area, that enable us to generate ten billion normal human cells, which is enough for up to 5,000 1,536 well plates, per batch. We are actively onboarding cutting-edge innovations such as microcarrier suspension culture systems to scale our work further.

Primary cells	Abbr.	Cell lines	Abbr.	iPSC-derived cell types
Normal Human Dermal Fibroblast	NHDF	Adenocarcinoma human alveolar basal epithelial cells	A549	iPSC-derived cardiomyocytes
Renal Primary Proximal Tubule Epithelial Cells	R-PTEC	Human Cardiomyocyte Cell Line	AC16	iPSC-derived neurons
Human Mesenchymal Stem Cells	hMSC	Spontaneous Immortalized Retinal Pigment Epithelial	ARPE-19	
Hepatic Progenitor Cells	HepaRG	Lung adenocarcinoma	Calu-3	
Skeletal Muscle Myoblasts	SKMM-Ad	Immortal Human Keratinocytes	HaCaT	
Human Renal Cortical Epithelial Cells	HRCE	Human Liver Carcinoma	HepG2	
Human Cardiac Microvascular Endothelial Cells	HMVEC-C	Breast cancer cell line	MCF7	
Human Pulmonary Artery Endothelial Cells	HPAEC	Human colon adenocarcinoma	Caco-2	
Human Umbilical Vein Endothelial Cells	HUVEC	Human primary pancreatic adenocarcinoma	BXPC3	
Normal Human Epidermal Keratinocytes	NHEK	Neuroblastoma cell line	SH-SY5Y	
Macrophages (from Apheresis, Leukopacs)	Macrophages	Monocytic cell line	THP-1	
Peripheral Blood Mononuclear Cells	PBMC	Human bone osteocarcoma epithelial cells	U2OS	
Adult Retinal Pigment Epithelial Cells	RPE-Ad	Mammary gland/breast; derived from metastitic site	AU565	
Renal Primary Proximal Tubule Epithelial Cells	R-PTEC	Human Hepatocellular Carcinoma	Huh7	
Small Airway Epithelial Cells	SAEC			
Normal Human Bronchial Epithelial Cells	NHBE			
Normal Human Lung Fibroblasts	NHLF			
Purified Monocytes (from Apheresis, Leukopacs)	Monocytes			

Table 2. Numerous and diverse cell types onboarded to our platform enable us to broadly interrogate biology. Over 30 human cell types have been onboarded to our high-throughput discovery systems to date, spanning primary cells, cell lines, and cells derived from iPSCs.

We maintain a strong track record of quality and consistency in our cell culture facility by implementing facility design and control systems that are uncommon among technology-enabled drug discovery companies. These designs and controls include rigorous process validation and documentation, a personnel training and qualification program, and routine quality monitoring. Our quality system is designed such that we routinely monitor our performance to identify and implement the appropriate preventive and continuous improvement actions.

Figure 15. We leverage bioreactor technologies pioneered by the cell therapy industry to grow massive cell quantities for our large in-house experiments.

Lab Robotics

We have assembled and synchronized robotic components, such as liquid dispensers, plate washers, and incubation stations, that enable us to efficiently execute up to 1.5 million experiments per week with only a small team overseeing the process at any given time. These robotic systems are modular by design and easily configurable to allow us to create complex and variable workflows. This flexibility is essential for executing experiments using our diverse biological tools (e.g., genetic and soluble factor) and chemical libraries at scale and with high quality.

We ensure our lab generates consistent, accurate, and precise data through the use of multiple systems: facility controls to prevent contamination of cells, rigorous assay validation and instrument qualification to ensure consistency, and routine quality monitoring to capture data automatically and track all critical experiment specifications. Our quality system is designed such that we routinely monitor our performance to identify and implement the appropriate preventive and continuous improvement actions.

Figure 16. **Our high-throughput automation platform looks more like a sophisticated manufacturing facility than a biology R&D laboratory.** Our platform can execute up to 1.5 million experiments each week with high-quality to enable downstream analyses.

Our laboratory operates approximately 50 weeks each year. Since 2017, we have at least doubled our throughput every year, and we expect that we will at least double our throughput again in 2021, while meeting our quality benchmarks. We have achieved this level of operational excellence by integrating state-of-the-art technology and adopting lean manufacturing principles.

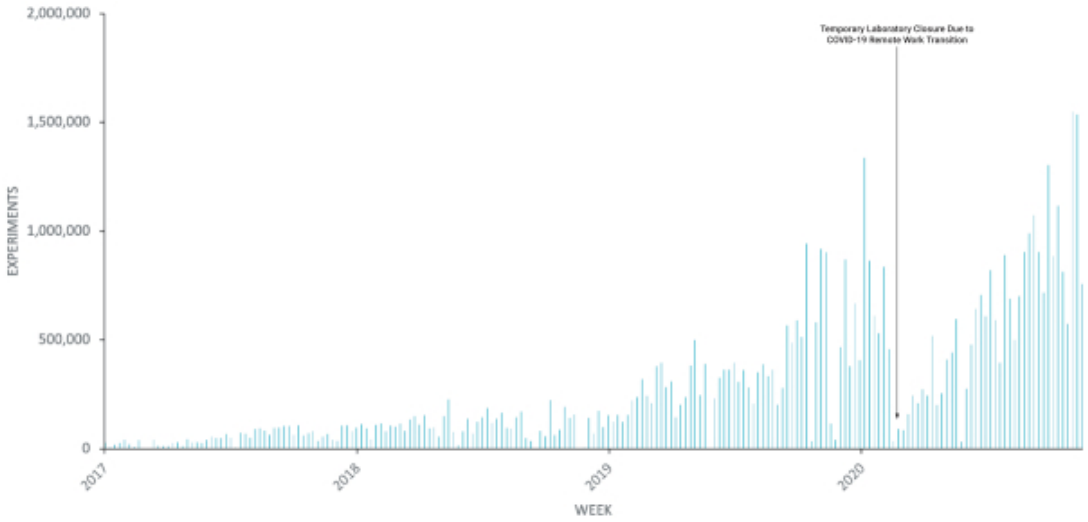


Figure 17. **The experimental throughput of our high-dimensional phenomics assay has scaled significantly over time.** The capabilities of our phenomics assay have grown throughout 2021 with quick recovery following a COVID-19-induced, full-office closure in early 2020.

Data Capture

The Recursion Data Universe contains approximately seven petabytes of highly relatable biological and chemical data spanning multiple different “-omic” modalities. We have invested in state-of-the-art equipment to capture this data at scale and processes to ensure that the highest quality data are fed into the Recursion Data Universe.

High-Throughput Microscopy. Central to the Recursion Data Universe is our image-based dataset. As of December 2020, we had a large installation of 13 ImageExpress microscopes in our labs. These microscopes run approximately continuously, capturing over 91,000 fluorescent microscopy images every hour across six imaging channels. Alerts are automatically triggered if quality issues are detected, enabling our teams to quickly reimage our experimental conditions to obtain higher quality data. Upon imaging, our digital data pipeline immediately uploads these images to the cloud where they are processed within seconds. On a weekly basis, our pipeline captures, uploads and processes up to 80 terabytes of imaging data to add to the Recursion Data Universe.

Figure 18. **Our large installation of high-throughput microscopes.** The 13 high-throughput automated microscopes are serviced by multiple robotic arms to enable near continuous imaging of our phenomic experiments. This imaging process not only increases the imaging speed but also reduces human intervention and error.

High-Throughput Sequencing. In 2020, we purchased and integrated our first sequencing system into our lab. This equipment enables us to capture whole-transcriptome measurements in-house. Over time, we intend to increase our investments in high-throughput sequencing and integrate larger-scale production systems to add another, rapidly growing, complementary data stream to the Recursion Data Universe.

In Vivo Data Collection. We use our proprietary cage hardware and continuous, high-resolution video systems to collect InVivomic data at scale. As of December 2020, we had seven cage systems operational and actively surveying a total of 343 possible *in vivo* subjects undergoing pharmacokinetics, efficacy, and safety studies of our drug candidates. This data is uploaded to the cloud in ten-minute segments where it is integrated into our Recursion Data Universe.

Figure 19. Our proprietary, scalable Smart Housing System for *in vivo* studies automatically collects and analyzes video and sensor data from all cages continuously.

Additional Data Collection Systems. Beyond phenomics, orthogonomics, and InVivomics, we continuously capture experimental data from bespoke assays as we validate our discovery programs. Example data capture infrastructure includes multiplexed readouts for biological analytes, flow cytometry, and electric cell-substrate impedance testing. As this data is generated, it is included in the Recursion Knowledge Store, our data warehousing system that connects one-off experimental assays with the rest of the Recursion Data Universe.

Technology Stack

The Recursion OS is built on top of a core technology stack that is highly scalable and flexible. We have adopted a 'hybrid-cloud' strategy, leveraging the benefits of both public and private cloud infrastructure depending on the context and our needs:

- *Public Cloud.* The public cloud is our default choice for production workloads and applications. The scale, elasticity of compute and storage, and economies of scale offered by public cloud computing providers enable us to cost-effectively execute our strategy.
- *Private Cloud.* The private cloud, or edge computing, is used to integrate our lab data flows, including the upload of data to the public cloud.
- *BioHive-1 and High Performance Computing in a Private Cloud*. In December 2020, we made a significant investment to expand our compute power, purchasing a world-class supercomputer named BioHive-1. With 320 GPUs and 200 peak AI petaflops, BioHive-1 is

estimated to rank number 66 on the TOP500 list of the world's most powerful supercomputers as of January 2021. This new compute power will allow us to iterate on new neural network architectures faster and more efficiently, accelerating our deep learning models and empowering our growing workforce of ML experts. Deep learning projects that take a week to run on our existing cluster will take under a day on the new cluster.

Figure 20. We believe BioHive-1 is one of the most powerful supercomputers dedicated wholly to drug discovery for a single company. This rendering shows what BioHive-1 might look like when installed, expected to be in early 2021. The supercomputer further expands our capability to rapidly improve ML models.

Enabling Software Tools

Alongside our infrastructure, we have built a suite of tools that empower our scientists to accurately design, execute, and verify the quality of over 1.5 million diverse experiments each week, spanning phenomic, orthogonomic, and ADMET assays. Our tools, which take into account real-time onsite reagent supplies, enable consistent control strategies and design standards that make each week's data relatable across time. Additionally, these tools automatically flag experiments or processes which miss quality requirements or stall at some point in the process and notify the appropriate Recursionaut, providing them the tooling needed for manual intervention.

Experiment Design Tools

Cauldron. Cauldron is our proprietary Laboratory Information Management System developed to track reagent inventory and facilitate the rapid and flexible selection of compounds from our library, biological reagents, and cell types/lines. Cauldron is seamlessly integrated with our laboratory equipment and operations so that real-time inventory can be viewed and accounted for during experiment design.

Experiment Delight. Experiment Delight is a custom software application developed to enable biologists and chemists to create large and sophisticated experimental designs (e.g., millions of

perturbation conditions) with ease using internally validated constructs that minimize experimental artifacts and noise while maximizing signal and relatability. Experiment Delight automatically randomizes perturbations to massive plate layouts, includes appropriate controls, creates reagent pick-lists, and automatically conducts basic quality assurance, better ensuring that experiment meta-data is managed within a single system.

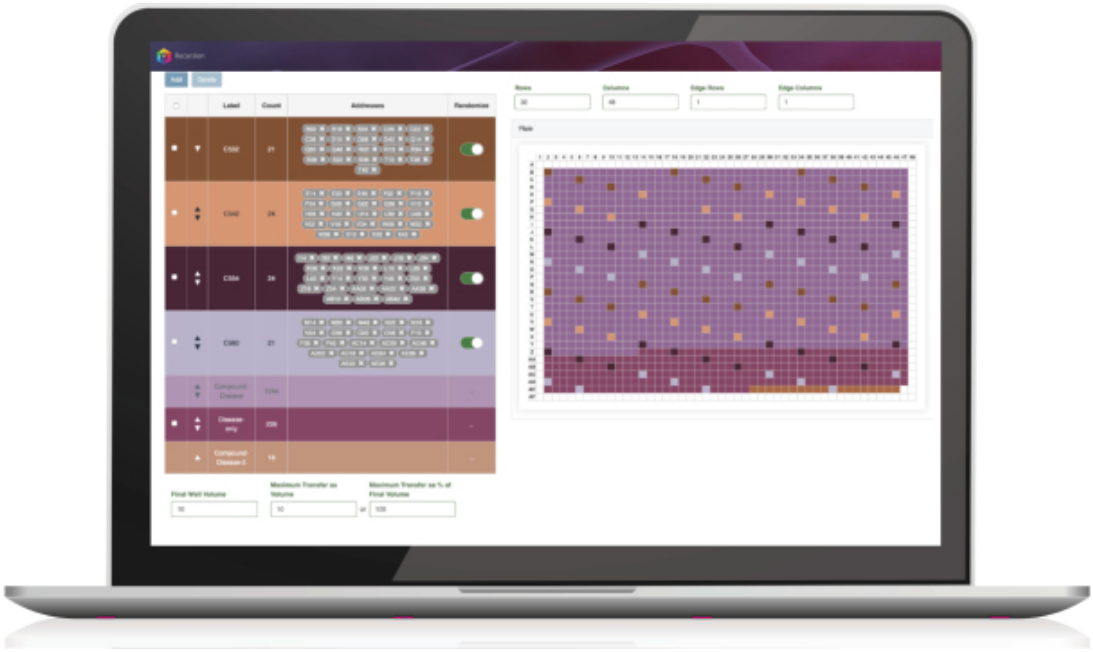


Figure 21. Experiment Delight allows our biologists to design massive experiments while complying with our complex proprietary rules for layout. Experiment Delight is our internal experiment design tool used to rapidly create large-scale experiment sets with high flexibility, while integrating our proprietary rules for experiment layout learned over approximately a decade of iterative improvement. The graphical interface facilitates experiment plate layout specification.

FreshCuts. FreshCuts is our proprietary algorithm for designing CRISPR gene editing guide RNAs for maximal knockout efficiency. The algorithm is based on our internal knockout efficiency sequencing data, generated from our own primary cell types used in our core phenomics platform. Using FreshCuts, we have created a proprietary, whole-genome arrayed CRISPR gene editing library, NARWHAL, providing demonstrable improvement in knockout efficiency over vendor guide designs.

Desired specificity for identifying high-efficiency CRISPR guides	FreshCuts improvement over Vendor Model
95%	2.7x
80%	2.2x

Table 3. FreshCuts exceeds state-of-the-art vendor library design algorithms. At every specificity threshold, FreshCuts is able to design a larger number of effective guides successfully.

Experiment Execution and QC tools

Experiment Execution Command Center. The Experiment Execution Command Center, or EECC, is a suite of tools and dashboards we developed that automatically executes and continuously

monitors experimental protocols designed by our researchers. EECC automatically compares meta-data from experiment designs and executed actions to confirm proper execution. Additionally, EECC allows users to monitor the progress of an experiment through various execution states and provides dashboards with clear metrics on our reliable experiment execution. This system is a mainstay for our teams responsible for reliable and consistent execution of our phenomics platform at scale.

Image Explorer. Image Explorer is a custom web application that enables our scientists to view and interact with microscopy images from our phenomics platform, including: isolating particular stains, filtering images in an experiment down to those with particular biological or chemical perturbations, and viewing meta-data associated with each image and experimental condition. Image Explorer is a critical tool for quality control and experimental debugging.

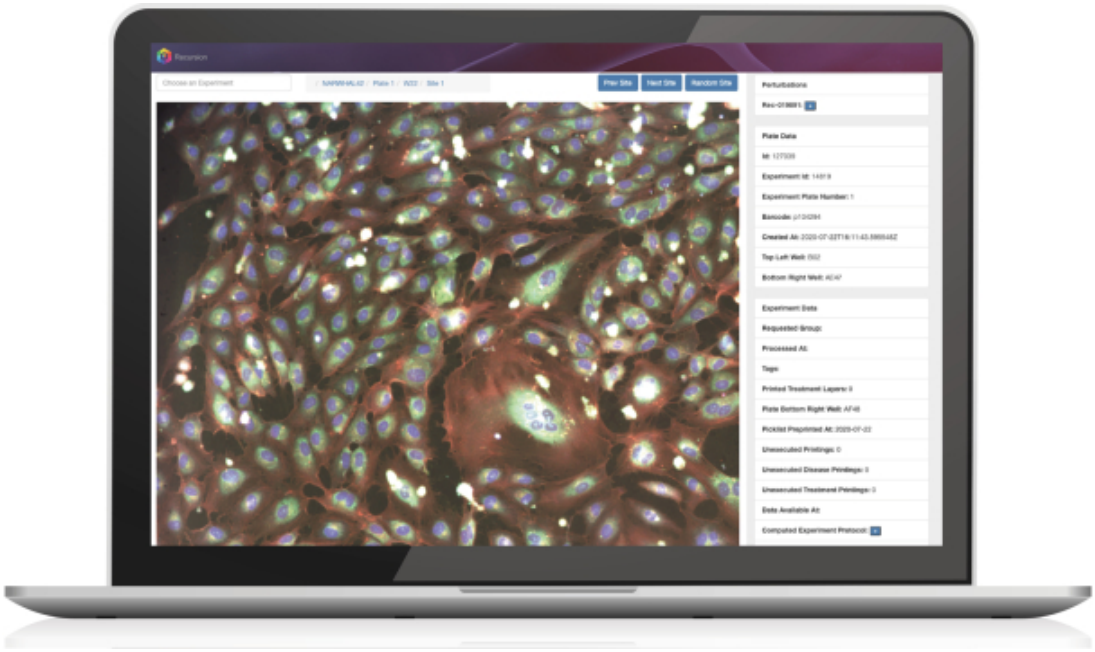


Figure 22. Image Explorer allows biologists to clearly view images to identify potential defects and ensure data quality. Image Explorer enables our scientists and lab technicians to view and explore our images along with the meta-data and any resulting quality control metrics.

Iconographer. Iconographer is our proprietary tool used to capture image-level quality control metrics and identify systematic errors as images are streamed from our platform to the cloud. These measures include summary statistics on channel intensities, quantifications of image focus, cell counts, and meta-data about the image capture. Iconographer integrates with other tools that examine trends across images, such as PlateWatch and components of the Experiment Execution Command Center.

PlateWatch. PlateWatch is a custom application used to detect plate-level quality issues. Due to the arrayed nature of our experimental conditions across microtiter plates, these experiments can sometimes be affected by confounding spatial intraplate effects, such as radial patterns. While our laboratory controls and robotics work cells reduce the noise and variation naturally associated with biological experiments, PlateWatch flags any anomalies so that issues can be resolved and, if needed, removed from the Recursion Data Universe.

Figure 23. PlateWatch enables our team to identify potential irregularities and ensure high-quality data enters the Recursion Data Universe. PlateWatch automatically generates plate-level metrics and figures to assist our technicians in providing quality control for all phenomics experiments, rapidly identifying possible problematic plates and ensuring high-quality data enters the Recursion Data Universe. In this case, a set of plates that did *not* pass QC due to plate effects across various parameters were automatically flagged for further review.

The Recursion Data Universe

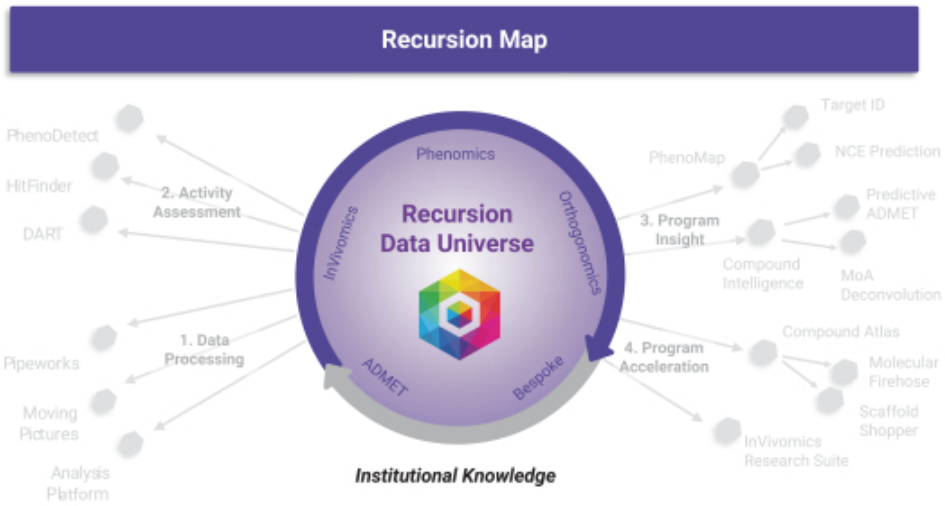


Figure 24. The Recursion Data Universe at the core of the Recursion Map. The central asset of the Recursion Map is the Recursion Data Universe, encompassing multiple data types that compound together, the whole providing greater insight than the sum-of-the-parts.

The Recursion Data Universe comprises approximately seven petabytes of highly relatable biological and chemical data including: phenomics, orthogonomics, ADMET assays, InVivomics, and bespoke bioassay data. These different data modalities are highly complementary as we advance drug discovery and development programs. Phenomic data provides a broad, foundational layer of biological and chemical data, while other datasets provide greater translational insights. The size of the Recursion Data Universe has grown by more than three-fold since 2018 and has continued to grow at an accelerating rate.

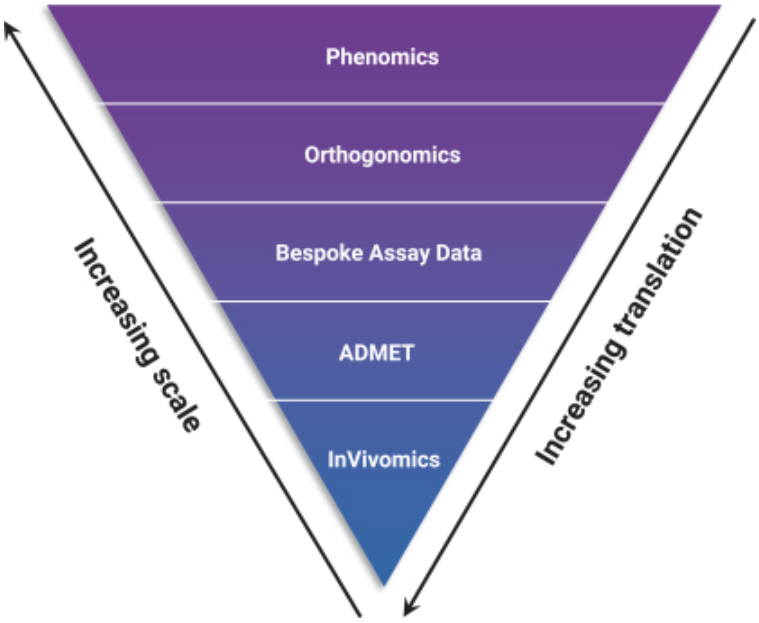


Figure 25. Diverse datasets within the Recursion Data Universe are highly complementary. The Recursion Data Universe consists of complementary datasets spanning multiple data modalities. While phenomics data can be generated cost-effectively and at scale, other datasets such as transcriptomics, proteomics, and InVivomics offer increasing insight as we translate programs from early discovery through development.

Phenomics

At the core of the Recursion Data Universe is our proprietary cellular image dataset generated by our automated phenomics platform. While the inputs to our phenomics platform may differ depending on the biological and chemical tools we use, the readout remains constant: a fluorescent microscopy image that captures composite changes in cellular morphology, a cellular phenotype. We use our single, proprietary staining protocol to capture these changes in cellular morphology across nearly all of our phenomic experiments. This protocol, consisting of six subcellular dyes imaged in six different channels, has been optimized to capture a wide array of biology across nearly any human cell type that can be cultured and perturbed in laboratory conditions. As a result, we can capture the effects of a wide range of biological and pharmacological phenomena of interest, including phenotypic changes induced by small molecules, genetic gain- and loss-of-function, toxins, secreted factors, cytokines, or any combination of the above.

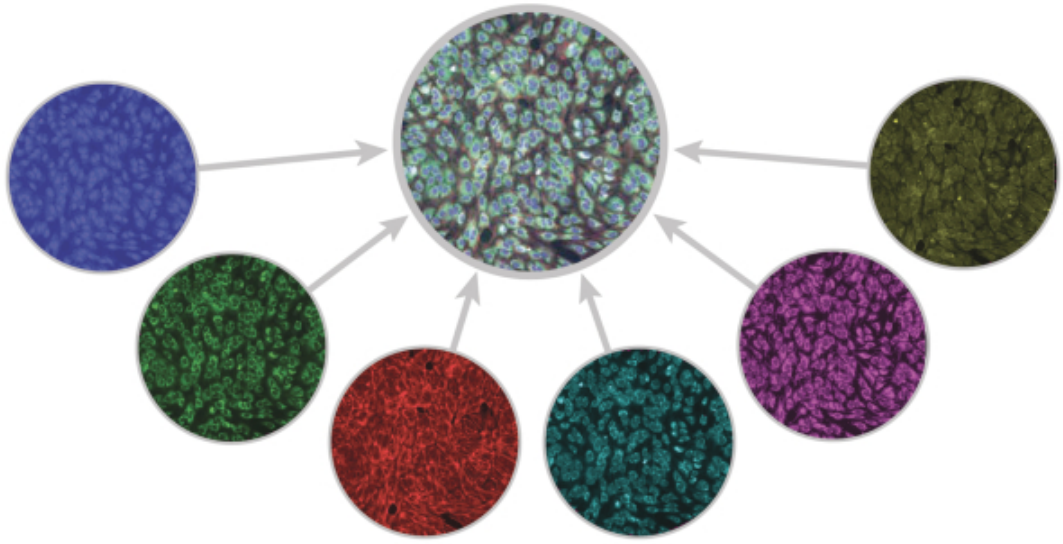


Figure 26. Our fluorescent staining protocol images multiple large cellular structures to capture a holistic assessment of cellular state. We use fluorescent dyes to stain a set of common cellular substructures that are subsequently captured using fluorescent microscopy imaging. Combined with tools from the Recursion Map, this complex and rich biological data modality can be used to solve a host of scientific questions. The top image is a composite of the 6 channels. It is followed by each of the 6 individual channel faux-colored images of HUVEC cells: nuclei in blue, endoplasmic reticula in green, actin in red, nucleoli in cyan, mitochondria in magenta, and Golgi apparatus in yellow. The overlap in channel content is due in part to the lack of complete spectral separation between fluorescent stains.

Cellular morphology is a holistic measure of cellular state that integrates changes from underlying layers of cell biology, including gene expression, protein production and modification, and cell signaling, into a single, powerful readout. Images are also two-to-four orders of magnitude more data-dense per dollar than other -omics datasets that focus on these more proximal readouts, enabling us to generate far more data per dollar spent to inform our drug discovery efforts. Indeed, since 2017 we have approximately doubled the capacity of our phenomics platform each year and currently generate up to nine million images or 80 terabytes of new data to the Recursion Data Universe per week across 1.5 million experiments. We expect to again double this capacity in 2021.

Lastly, our phenomics approach builds on the recent explosion of powerful computer vision and ML approaches driven by the technology industry over the last half decade. Modern ML tools can be trained to identify the most salient features of images without relying on any pre-selected, disease-specific subject matter expertise, even if these features are imperceptible to the human eye. Using these tools, we can capture the aggregate cellular response induced by a disease-causing perturbation or therapeutic, and quantify these changes in an unbiased manner, freeing us from human bias. In contrast, traditional drug discovery relies on presumptive target hypotheses and bespoke biological signaling assays, that only capture narrow, pre-determined biology limiting the scope of biological exploration.

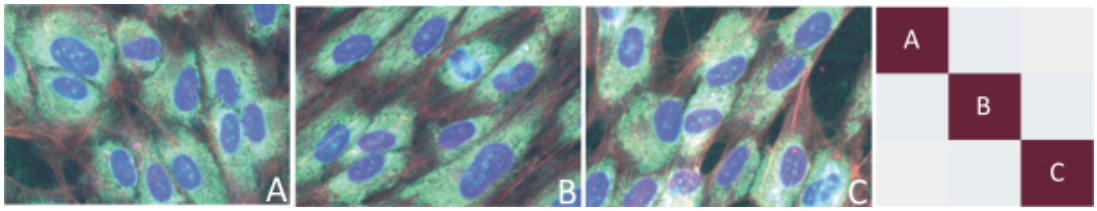


Figure 27. ML algorithms can detect cellular phenotypes that are indistinguishable to the human eye. Most morphological differences within our images are too subtle for the human eye to detect; however, ML algorithms like those we deploy in our Recursion Map can readily distinguish between them. The heatmap of similarities shown here between learned embeddings of these images shows clear separation of highly similar cellular changes.

Orthogonomics

Phenomics provides cost-effective, information-rich, and functional biological data well-suited for broad biological exploration; however, other data modalities such as transcriptomics and proteomics can be highly complementary. Both of these approaches generate supplemental data that can be useful for i) unraveling the mechanism of action by which a compound is active and/or ii) more precisely measuring (and confirming) a compound's functional activity and efficacy. While the costs to measure bio-molecules using these approaches are orders of magnitude more expensive compared to phenomics, this data can be highly informative to advance programs. Additionally, if we are able to generate this data cost-effectively and at scale, we may be able to significantly reduce the time needed to develop specific assays on a per bio-molecule basis. Collectively, we refer to these alternative modalities as orthogonomics, the generation and integration of orthogonal -omics-level datasets as a part of the Recursion Data Universe.

Scaled Transcriptomics. We have developed an in-house laboratory process capable of profiling over 20,000 genes from samples drawn from any of our biological modules. We routinely run this process on hundreds of samples per week and, as of January 2021, have amassed whole transcriptome data for 1,920 different individual perturbations. Taking our learnings from scaling phenomics, we are actively increasing throughput and driving down sample costs to scale this approach by orders of magnitude.

Scaled Proteomics. In January 2021, we entered into a year-long agreement with a proteomics vendor to measure protein-level changes across thousands of analytes for thousands of samples in order to accelerate our functional validation and mechanistic deconvolution efforts. In parallel, we are co-developing custom proteomics panels to enable measurement of post-translational modifications as well as scaled and more cost-effective multiplex proteomics panels. In small pilot proteomics studies to date, with approximately 166 protein analytes, we have demonstrated that the resulting "proteoprints"

can help inform and guide program validation by identifying pathways and specific proteins affected by both disease-causing perturbations and therapeutic compounds identified by our platform.

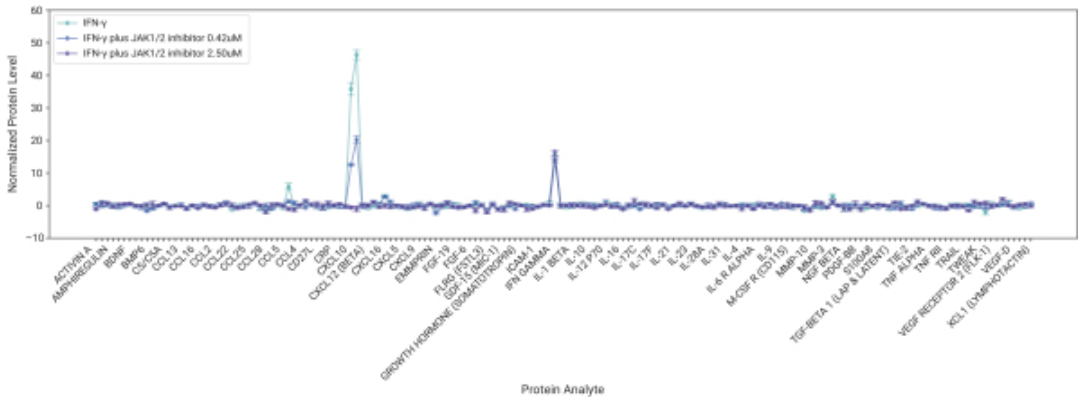


Figure 28. Proteomic capabilities add a rich volume of functional data that is complementary to our phenomics dataset. Demonstration of a small molecule JAK1/2 inhibitor rescuing the complex proteomics signature induced in primary human cells by IFN-g. Integrating additional modalities like proteomics increases the diversity of data available in the Recursion Data Universe.

Other Scaled -omics. Exploration and development of scaled metabolomics and lipidomics are on our roadmap as additional medium-throughput mechanisms for orthogonal validation.

ADMET Assays

While our phenomics platform has historically been used to identify signals of compound efficacy, we are actively exploring the use of our image-based readout to predict ADMET liabilities of promising compounds early in the drug discovery process. Poor *in vivo* pharmacokinetics, including unwanted side effects, are a major driver of late-stage drug program failures.

To train predictive ADMET models, our team has built large-format ADMET datasets spanning various compound liabilities including CYP inhibition, which can indicate risk of complication from drug-drug interactions and hERG liabilities, which may suggest a heightened risk for heart arrhythmias. In addition, we developed a cardiomyocyte-spheroid beating assay to serve as an *in vitro* proxy of cardiotoxicity. All such ADMET data, generated using our in-house compound libraries, resides within the Recursion Data Universe. Importantly, unlike conventional ADMET data that is often created only for single-program use, our ADMET data is generated under highly controlled and standardized assay conditions to enable high-fidelity predictive models.

As discussed in subsequent sections, this ADMET data has been combined with phenomic and compound structure data to create early predictive models, winnowing those drug candidates with higher likelihood of potential liabilities before investing time and resources.

InVivomics

In vivo studies are an important tool for providing an assessment of the efficacy and safety of a compound within the context of a complete, complex biological system. Similar to other steps within the drug discovery and development process, conventional *in vivo* studies are fraught with human bias and limited in the endpoints that they measure. Using our In Vivo Data Collection Infrastructure, we can collect more holistic measurements of an individual animal's behavior and physiological state using

continuous video feeds and our proprietary animal cages, surveilling animals in their home environment. By automating the process of data collection, we can amass uninterrupted data on animal behavior and physiology across days, weeks, or even months allowing for a more accurate and holistic assessment of the animal's health state across the entirety of the study. This data can subsequently be used to create more abstract representations of animal behavior, allowing us to rapidly phenotype new animal models and identify *in vivo* disease signatures that may be more relevant for assessing compound efficacy and potential liabilities.

Bespoke One-Off Assays

In addition to the large format datasets described above, our team is experienced at developing custom assays needed for program-specific validation at smaller scale. These assays encompass diverse biomolecules, including nucleic acids, proteins, and lipids, allowing for complete coverage across diverse therapeutic areas. Representative examples of these bespoke assays include:

- High-content protein translocation readers and multiplexed readers to measure protein changes
- qPCR or bead-based technologies to measure panels of transcript changes
- Mass spectrometry to measure more challenging biomolecules (e.g., low abundance proteins, lipids and metabolites)
- Electric cell-substrate impedance sensing, live-cell imaging and other functional readouts
- Flow cytometry to measure distinct cellular subpopulations

As this data is generated, it is included in the Recursion Knowledge Store, our data warehousing system that connects one-off experimental assays with the rest of the Recursion Data Universe.

Recursion Map

The Recursion Map is a rapidly growing suite of in-house software applications designed to process and translate data from the Recursion Data Universe into actionable insights for our research and development teams to accelerate programs.

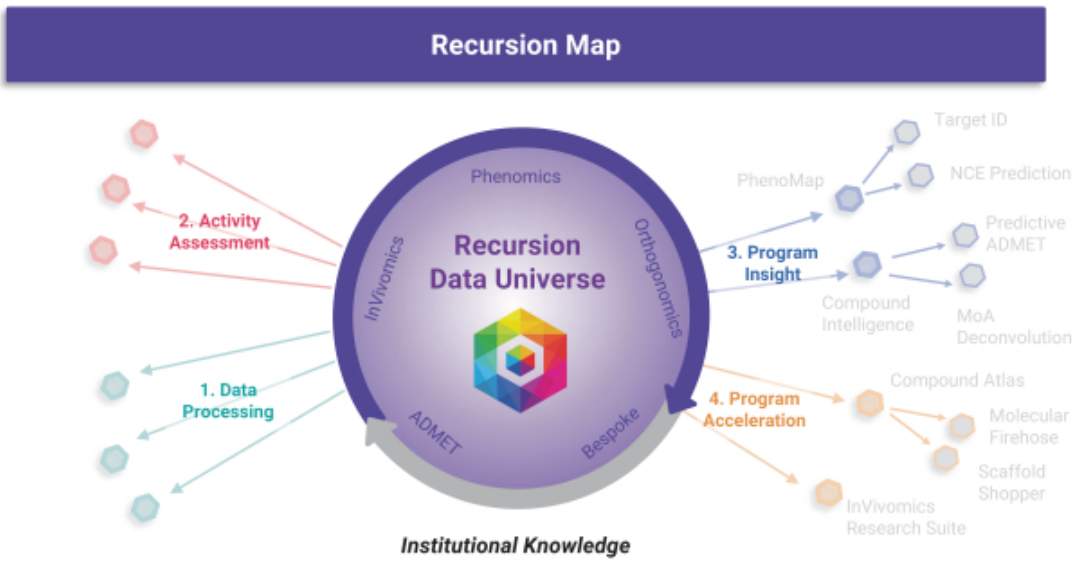


Figure 29. The Recursion Map. The Recursion Map is a combination of massive biological and chemical datasets, or the Recursion Data Universe, and a suite of proprietary data generation, discovery, and development tools that transform data into actionable insights. The combination of our proprietary data generation and software tools provides the basis for data-driven decision making.

Data Processing Tools

To understand, explore, and relate new or existing data in the Recursion Data Universe, we must normalize, transform, and analyze the data. Our tools in this layer manage the streaming of our data at scale to the appropriate public and private cloud, the transformation of our images into mathematical representations through our in-house proprietary convolutional neural networks, and the standard and custom analyses performed on our data as parameterized and requested by users. Anomalies are flagged to the team for fast resolution.

Moving Pictures. Moving Pictures is our proprietary application for securely and efficiently *moving* massive image data from our phenomics platform to the cloud environment, a non-trivial and highly-critical step in our data processing pipeline. On a weekly basis, this data transfer may approach 80 terabytes across approximately 1.5 million experiments. Moving Pictures is tightly integrated with both our hardware and other software systems and highly fault-tolerant.

Pipeworks. Pipeworks is our proprietary in-house system for handling and *orchestrating* diverse image-level processing activities across millions of images generated weekly on our phenomics platform. Using Pipeworks, we can apply complex computer vision algorithms to extract signals from our high-dimensional images and subsequently run deep convolutional neural networks, trained on our large microscopy image repository, to create high-dimensional abstract feature representations from these images.

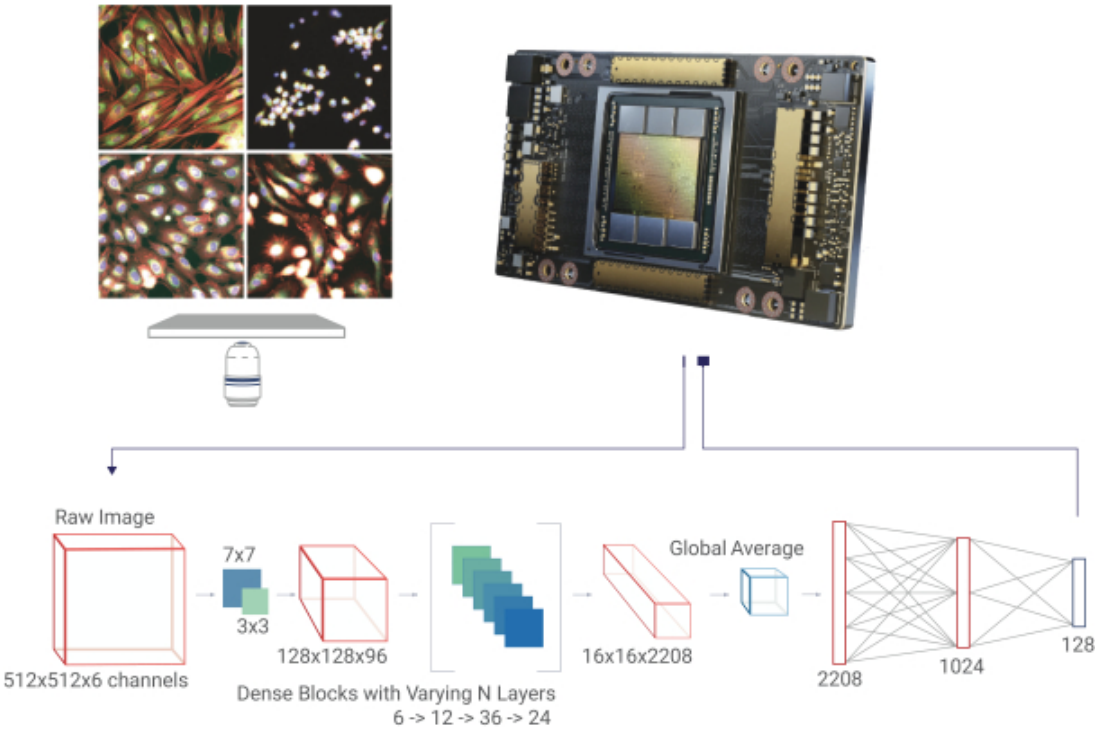


Figure 30. The Pipeworks process converts raw images into a list of features that allows cross-image comparison. Microscopy images are run through a deep convolutional network with an architecture similar to the one above, as orchestrated by Pipeworks. The network is trained on our phenomics data so that, layer by layer, each image is transformed into a list of 128 features representing the cellular biology in the image. The resulting features power downstream analysis.

Analysis Platform. Our Analysis Platform is responsible for executing defined tasks using the feature representations created by Pipeworks, experiment meta-data from design tools, and analysis parameters as defined by our scientific team members. These tasks may include performing biological and chemical activity assessments, preparing data for use in our inference-based screens, and evaluating the quality of our feature representations. Data scientists routinely add more analyses to the system that scientists can then select. Analysis Platform is robust, reproducible, and highly flexible, enabling us to quickly onboard different disease models and experiment types.

Biological and Chemical Activity Assessment

Our Activity Assessment tools enable us to evaluate the robustness of diverse disease model phenotypes and subsequently measure the activity of potential therapeutic agents within these disease models. These tools are target-agnostic by design, explore cellular biology holistically, and enable the exploration of many disease models and potential therapeutics simultaneously with no significant alteration to the core platform.

PhenoDetect. PhenoDetect is our proprietary application for *confirming the statistical significance* of disease phenotypes generated on our platform through the introduction of one or more biological perturbations. This step is critical for mapping a given biological perturbation (e.g., CRISPR genetic knockout) to its high-dimensional and reproducible changes in cellular morphology. These phenotypes are the primary input into downstream analyses, including predicted gene-gene and gene-molecule relationships.

HitFinder. HitFinder is our software tool for evaluating the activity of therapeutic candidates (small or large molecule) within a high-dimensional disease model. This process differs from traditional drug discovery approaches in several important ways. First, whereas traditional biochemical assays measure a compound's activity against a single hypothesized target of interest, HitFinder measures a compound's ability to rescue a disease phenotype induced by a disease-causative biological perturbation. This 'target-agnostic' assessment prevents us from injecting human bias into the process. Second, while traditional assays are low- or univariate measures, HitFinder assesses compound activity in a high-dimensional context, increasing the likelihood that activity we observe is unlikely due to random chance. Lastly, HitFinder is able to rapidly assess the activity of large and diverse chemical libraries, at a scale that surpasses most traditional methods.

Drug Activity Report Table. Drug Activity Report Table, or DART, is our proprietary software tool for summarizing and visualizing compound activity data. Importantly, within DART researchers can compare a compound's i) ability to rescue those morphological changes that were specifically induced by the biological perturbation used to model the disease of interest and ii) any new morphological changes induced by the compound, an early measure of potential off-target or deleterious on-target effects. Using DART, researchers can rapidly identify and prioritize molecules with those believed to have the greatest potential for both efficacy and safety for advancement.

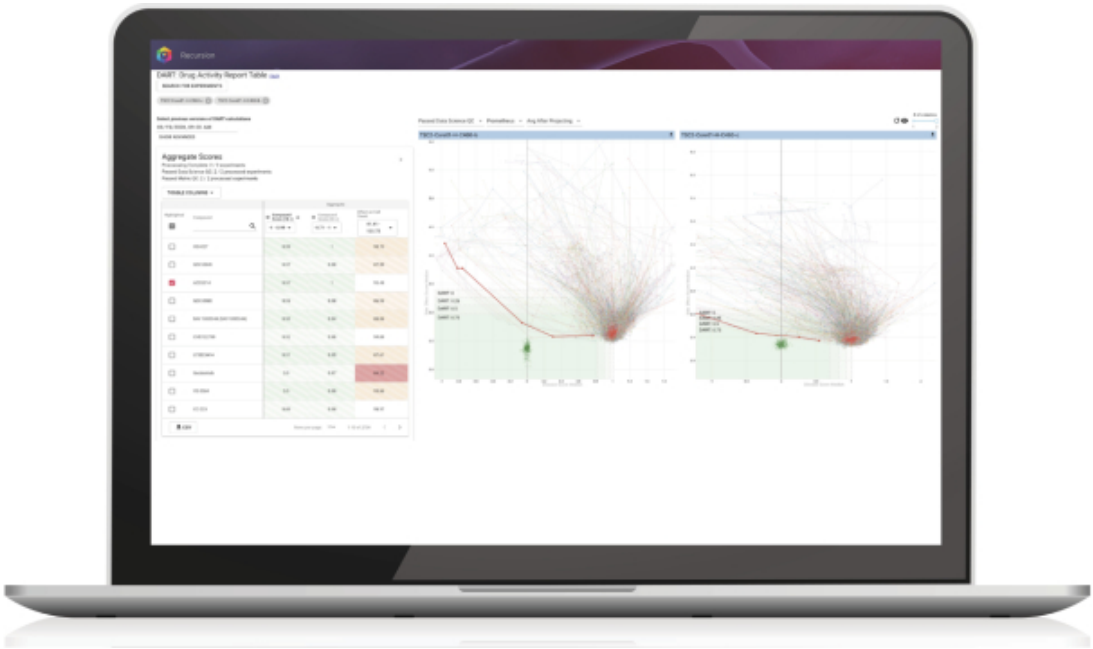


Figure 31. DART enables our biologists to rapidly identify compounds with maximum effect on a disease phenotype while minimizing other effects. The results from our empirical hit identification screens are presented in DART, our user interface that allows drug discovery teams to rapidly explore and understand results and focus on what is believed are the most promising compounds tested.

Program Insight

Our Program Insight tools translate processed data into actionable insights. These insights fall into two broad buckets: i) insights into underlying biology and early therapeutic starting points, or where to begin?, and ii) insights into the specific chemical substrate of interest, or which to advance and how?. We mine the Recursion Data Universe of biological and chemical data to predict therapeutic activity and behavior that may seed new NCE programs or new uses of known chemical entity programs. Compound Intelligence tools enable us to infer a compound's mechanism of action and potential ADMET liabilities based on measures of similarity to other high-dimensional landmarks in our dataset and predictive models incorporating images and chemical structure.

PhenoMap. PhenoMap is a massive relational database of biological and chemical perturbation phenotypes that allow us, based on phenotypic similarity, to infer the relationship between any two perturbations (or groups of perturbations) *in silico*. To date, we are able to infer over 13 billion relationships, which are generated solely by ML tools without any human bias and allow us to understand the mechanisms underpinning disease and how to manipulate those mechanisms to improve human health. For example, we can query the similarity (or dissimilarity) created by the CRISPR-engineered knockout of any two genes from our whole-genome arrayed CRISPR screen, revealing both known and novel drug targets never before described in scientific literature. We can query the similarity between any small molecule in our library and all genetic knockouts, uncovering a compound's mechanism of action and, most importantly, infer the activity of such molecules against high-value drug targets. Our ability to probe the relationships between any perturbation in our library (spanning the genome and approximately one hundred thousand small molecules) changes drug discovery from an iterative trial-and-error process into a computational driven 'search' problem.

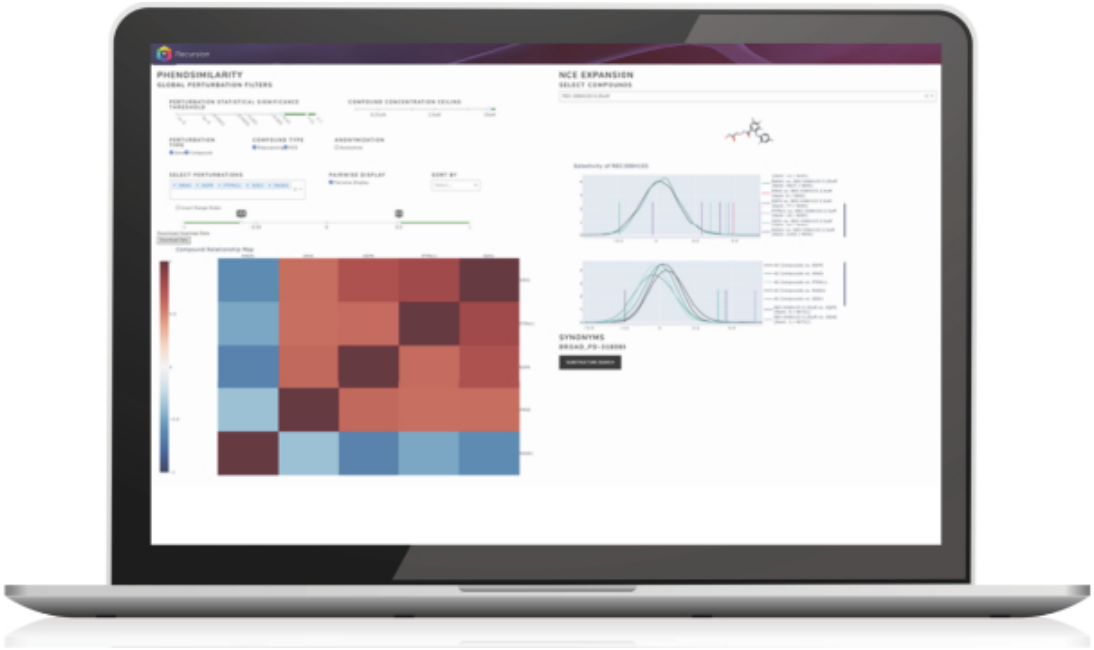


Figure 32. The PhenoMap allows our team to view multiple inferred comparisons side-by-side to rapidly identify relationships between genes and compounds. Our PhenoMap tooling enables us to rapidly explore inferred biological and chemical relationships in order to i) run target discovery, ii) predict active hits, iii) optimize for phenosimilarity and iv) deconvolve mechanism of action.

In the future, we aim to include an ever increasing array of insights from the full digital drug discovery pipeline stack: physicochemical and structural information about compounds in our physical libraries as well as predictions about synthesizable compounds not yet tested on our platform, ADMET assay readouts and predictions, and eventually even *in vivo* readouts and predictions.

Compound Intelligence. Our Compound Intelligence, or CI, tools generate deep and early insights into specific therapeutic candidates, helping us to advance those with favorable properties and cull those with higher likelihood of failure before investing valuable time and resources. Using one application of CI, we can elucidate the mechanism of action of NCE compounds either by comparing a compound's phenotype to i) those from our whole-genome arrayed CRISPR experiments (querying whether the phenotype induced by inhibition of a small molecule mimics any genetic knockout in our library) or ii) those phenotypes induced by well-annotated compounds in our repurposing library. Using a different application within CI, we can use our growing ADMET dataset and computational models to predict specific ADME and toxicology endpoints for therapeutic candidates. Compounds with low predicted ADMET properties are advanced. Compounds with high predicted ADMET properties may be discarded or flagged for subsequent investigation.

Program Acceleration

Once insights have surfaced, our researchers have a suite of digital chemistry and translational tools at their disposal to optimize compounds and accelerate discovery and development programs.

Compound Atlas. Compound Atlas is a collection of our proprietary and commercially-available digital chemistry tools that enables our scientists to expand from promising therapeutic starting points into more diverse chemical substrate using large, enumerated chemical libraries from vendors such as Enamine and WuXi. Scaffold Shopper, a module within Compound Atlas, can compare candidate compounds identified by our platform to over 12 billion ready-to-synthesize and off-the-shelf molecules based on our 3D chemical functionality and shape-based similarities, within a matter of minutes and at low computational expense. Additionally, we have built software that enables our chemists to rapidly assemble dense mini-libraries around reproducible and validated hit molecules to accelerate SAR establishment without requiring custom synthesis.

Figure 33. Scaffold Shopper enables our chemists to rapidly identify read-to-synthesize and off-the-shelf compounds for hit expansion. Comparisons are based on 3D chemical functionality and shape-based similarities generated within a matter of minutes and at low computational expense.

Molecular Firehose. Molecular Firehose filters the expansive search results from Compound Atlas, so that our medicinal chemists can rapidly prioritize molecules of interest. Chemists can dynamically filter search results with a range of molecular properties and both 2D and 3D-based similarity scoring to better identify an appropriate compound set to order for synthesis from our chemical vendors.

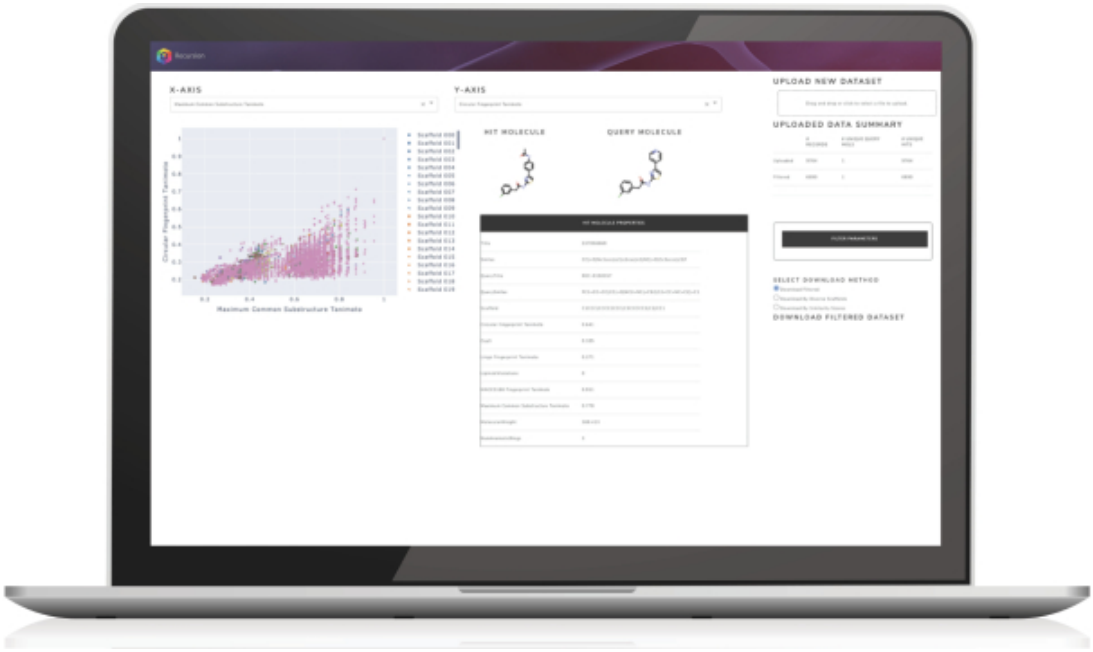


Figure 34. Molecular Firehose adds filtering capabilities along multiple properties to rapidly identify ideal compounds to synthesize. Molecular Firehose provides dynamic analysis and filtering of results from our large-scale chemical expansions, enabling our medicinal chemists to rapidly identify the next set of compounds to order and test on our platform.

InVivomics Research Suite

The InVivomics Research Suite is our proprietary collection of software tools that enables scientists to monitor and analyze behavioral and physiological data from ongoing and completed *in vivo* studies. Study data for individual animals or aggregated across study groups can be explored in near real-time, better ensuring that the final study data will be reproducible and interpretable. Continuous monitoring allows researchers to similarly flag unexpected effects that may arise from animal handling, dosing, or compound liabilities and modify or terminate the study as needed. At the end of the study, graphs and data tables are automatically generated to aid in the evaluation of study results and design of follow-up *in vivo* studies.

More importantly, continuous video feeds and our proprietary animal cages enable us to amass uninterrupted data on animal behavior and physiology across days, weeks, or even months. ML tools within our InVivomics Research Suite can then be used to create more abstract representations of animal behavior, allowing us to rapidly phenotype new animal models and identify *in vivo* disease signatures that may be more relevant for assessing potential compound safety and efficacy attributes.

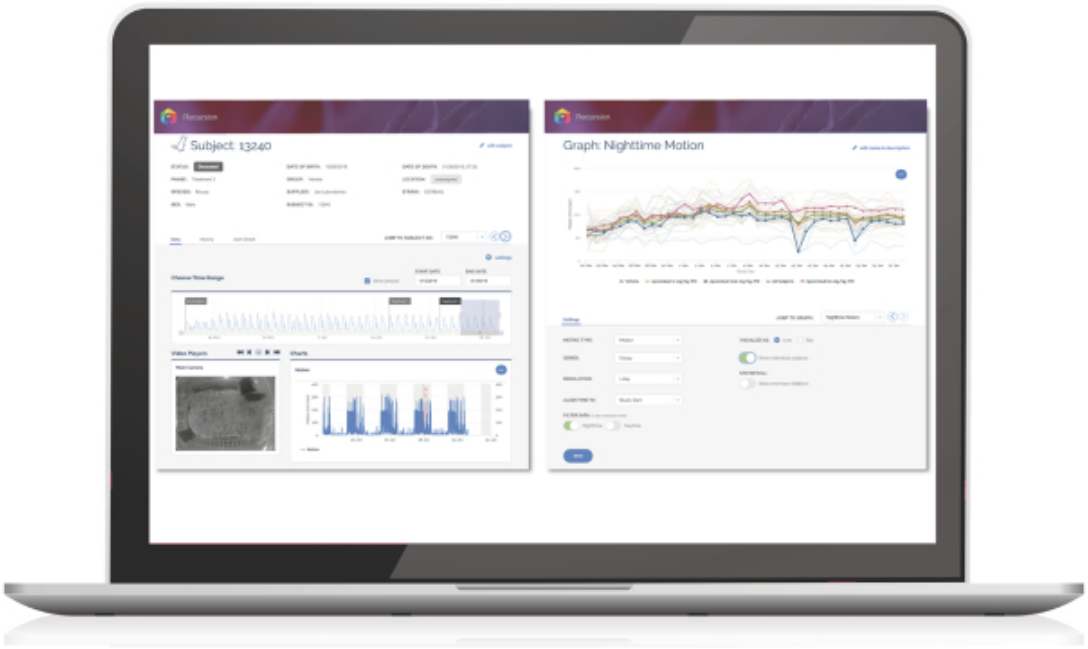


Figure 35. InVivomics Research Suite allows our team to track and analyze a broad swath of data in ongoing animal studies. The Research Suite enables our *in vivo* scientists to monitor individual subjects through near real-time video feed and data generation and review study level data.

Institutional Knowledge

Knowledge Store. Knowledge Store is a data warehousing system that encompasses Recursion Data Universe, the electronic lab notebooks generated by our research scientists, and the technical analyses posted to our internal Knowledge Repository by our data and ML scientists. Knowledge Store is centralized and accessible for authorized Recursionauts and helps preserve institutional knowledge, further collective learning, and generate ideas for new discovery and development tools.

Bridging from Recursion Map-based Insights to Program Advancement

Tools within the Recursion Map translate experimental results into actionable insights that our research and development teams can use to accelerate programs at each stage of the drug discovery and development process. While there is no ‘standard’ drug discovery program, most programs under our inferential search approach proceed as follows:

- We identify an early therapeutic starting point or novel biological target using the Recursion Map.
- We empirically validate compounds in a disease-relevant background.

- We predict the mechanism of action for compounds that demonstrate activity.
- We optimize compounds into viable drug candidates.
- We select and advance drug candidates into clinical development.

Step 1: Identify Early Therapeutic Starting Points and Novel Biological Targets. Using the Recursion Map, we can screen, and subsequently infer relationships among thousands of diverse biological perturbations, including CRISPR gene knockouts, soluble factors, viruses, bacterial toxins, and hundreds of thousands of small molecule perturbations *in silico,* based on the similarity (shades of red in the figure below) or dissimilarity (shades of blue in the figure below) of each perturbation's high-dimensional phenotype. Using these inferred relationships, we can elucidate both novel drug targets or early therapeutic compounds to start new drug discovery programs.

In order to identify novel program starting points, it is critical that the Recursion Map can accurately predict relationships across diverse domains of biology. To confirm the accuracy of our predictions, we have demonstrated that our approach recapitulates well-known biological pathways. In the example below, we used CRISPR gene editing tools to knock out genes in canonical biological pathways. In addition, we profiled small molecules that are known agonists or antagonists of these same pathways. Comparing the phenotypes induced by these perturbations to one another, we observed that i) each perturbation creates a unique phenotype but that ii) phenotypes form clusters that recapitulate well-understood biological pathways, including genes involved in:

- Bcl-2 signaling
- NF-κB signaling
- RAS signaling
- JAK/STAT signaling
- TGFß signaling

These findings not only validated the accuracy of our predictions, they suggest that we can use our inferential search approach to identify new drug targets or early therapeutic starting points to seed new drug discovery programs.

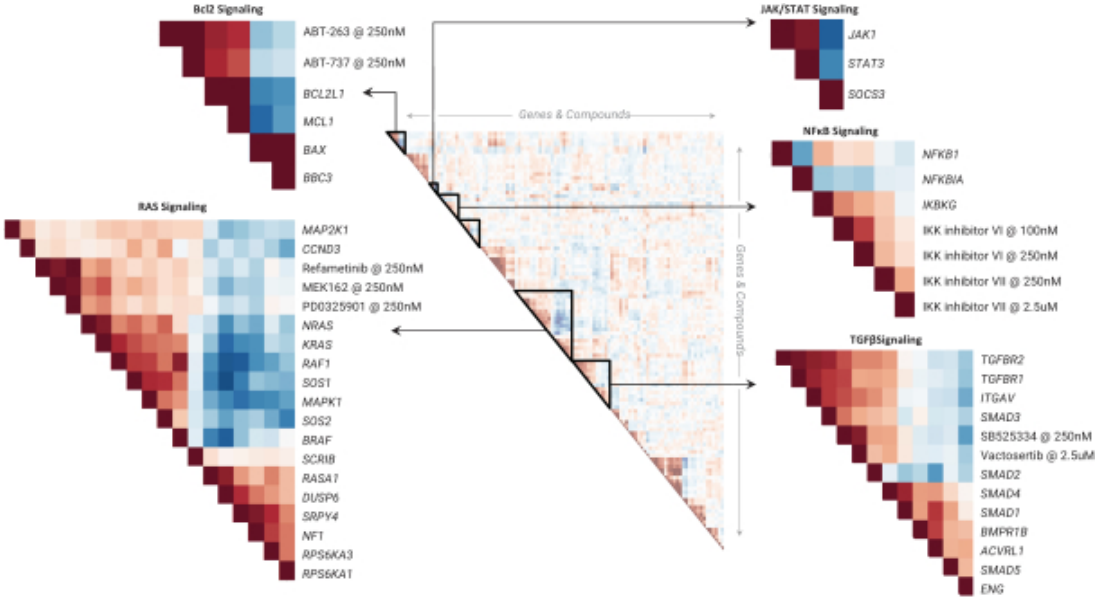


Figure 36. Inferred relationships between genes and small molecules reconstruct known biology. A small fraction of the more than ten billion inferred relationships produced by our Recursion Map are shown. Shades of red reflect an increasing degree of phenotypic similarity. Shades of blue reflect an increasing degree of phenotypic oppositeness. Highlighted sections of the Recursion Map reveal expected relationships along well-studied biological pathways.

Step 2: Empirically Validate Compounds in a Disease-Relevant Background. Having selected a compound of interest based on its *inferred* activity, we then *physically* screen candidate compounds in the disease-relevant background to confirm our predictions.

In order to prioritize candidates for advancement, it is critical that our platform can accurately measure the activity of compounds. To confirm the accuracy of our measurements, we have demonstrated that our models correctly rediscover compounds that are known to be active in human diseases, also known as positive controls. To date, we have executed over 200 studies reconfirming the activity of well-known positive controls. These experiments span:

- Small molecules and antibodies that have been previously studied and documented in scientific literature, are currently in clinical trials, and/or are marketed treatments.
- Dozens of different diseases and related biological pathways.
- Three different techniques we use to model disease, including soluble factors, CRISPR and BacMam genetic gain-of-function.

The table below summarizes a subset of the hundreds of established clinical and development drugs from across the industry that we have rediscovered on our platform.

CRISPR Loss-of-function Disease Models

Gene	Disease Or Pathway	Drug #	Class*	Drug Compound(s)*
BMPR2	Pulmonary hypertension	1	SRC	Saracatinib
LEMD3	Buschke-Ollendorff syndrome	4	ALK5	GW788388, EW-7197, LY21557299, SD-208
NF1	Neofibromatosis type 1	5	MEK	RO5126766, PD 184352, MEK162, Pimasertib, GDC0623
TP53	Li-Fraumeni Syndrome	1	p53	RITA
PTEN	Cowden syndrome	22 7 6	PI3K AKT mTOR	GDC-0980, AZD6482, IPI-145, Acalisib, Pilaralisib + 17 GSK690693, MK-2206, Triciribine, Afuresertib, AKTi-1/2 + 2 XL388, AZD2014, WYE-125132, CC-223, AZD8055 +1
SOCS3	Pathway biology	13	JAK	Solcitinib, Tofacitinib, Ruxolitini, Baricitinib, TPCA-1 +8
TSC2	Tuberous sclerosis	18	mTOR	Everolimus, Temsirolimus, PP242, CC-223, OSI-027 +13
VHL	Von Hippel-Lindau syndrome	1	HIF-2α	PT2385

Soluble Factor Disease Models

SF	Disease Or Pathway	Drug #	Class*	Drug Compound(s)**
IFNα	Multiple inflammatory diseases	2 4 2 5	INFα (a) PI3K IKK JAK	Anifrolumab (a), Sifalimumab (a) VS-5584, GDC-0980, Pilaralisib, PF-4989216 AZD-3264, TPCA-1 Tofacitinib, Baricitinib, Ruxolitinib, AZD1480, AZ960
IFNγ	Multiple inflammatory diseases	1 16	IFNγ (a) JAK	Emapalumab (a) Oclacitinib, Ruxolitinib, Tofacitinib, Peficitinib, AZD1480 +11
IL-1β	Multiple inflammatory diseases	1 5	IL-1b (a) IKK	Canakinumab IKK-1, ACHP, LY2409881, AZD-3264, TPCA-1
IL-4	Multiple inflammatory diseases	1 5	IL-4 (a) JAK	AMG317 (a) Ruxolitinib, Tofacitinib, TG 101209, TG 101348, NVP-BSK805
IL-6R	Multiple inflammatory	4	JAK	Baricitinib, Tofacitinib, Oclacitinib, Ruxolitinib
IL-13	Asthma and allergy	2 16	IL-13 (a) JAK	CNTO607 (a), Lebrikizumab (a) NVP-BSK805, Cerdulatinib, Tofacitinib, Solcitinib, CYT387 +12
TGFβ-2	Fibrosis diseases & cancers	1 6	TGFb (a) ALK5	Fresolimumab (a) SD 208, SB 525334, GW 788388, Repsox, SB 431542 +1
TNFα	Many autoimmune diseases	3 5	TNFa (a) IKK	Adalimumab (a) Infliximab (a), Golimumab (a) TPCA-1, AZD 3264, ACHP, LY2409881, BMS 345541
VEGF	Angiogenic factor/tumor	23	VEGFR (1a)	Bevacizumab (a), Sorafenib, Sunitinib, Ponatinib, Axitinib +18

Bacmam Gain-of-function Disease Models

Gene	Disease Or Pathway	Drug #	Class*	Drug Compound(s)
BRAF	Multiple cancers	1 1 1	ERK inhibitor BRAF (a) MEK inhibitor	Ulixertinib Dabrafenib MEK162

Table 4. The Recursion Map accurately recovers activity of known positive controls. This table summarizes approximately 200 compounds that have shown activity in clinical trials and which our platform has accurately recovered using our brute-force approach.

Step 3: Predicting the Mechanism of Action. Having validated our predictions empirically, our medicinal chemists work to further understand the mechanism by which compounds are operating, traditionally the 'Achilles heel' of phenotypic drug discovery. Our KCE library contains thousands of compounds with well-annotated mechanisms of action. The phenotypes from these compounds, as well as thousands of genes that we have knocked out using our CRISPR-gene editing tools, are included in our Recursion Map. Using this information, our chemists can compare the phenotype of our validated compounds to these high-dimensional 'landmarks' and assess its degree of similarity.

In order to confidently predict a compound's mechanism, it is critical that the Recursion Map can accurately capture mechanistic similarity of small molecules based on phenotypic relationships. We have demonstrated that, while all compounds create unique morphological changes in cells, compounds that share similar mechanisms of action show a higher degree of phenotypic similarity to one another. In the example below, we tested a large number of compounds with known mechanisms of action using our phenomics platform. When we plot the resulting phenotypes based on phenotypic similarity, we observe that i) they are highly varied but also ii) form hundreds of clusters based on mechanistic similarity.

These results suggest that, given a compound of interest with an unknown mechanism, we may be able to compare it to our KCE library of well-annotated compounds and deconvolve its mechanism.

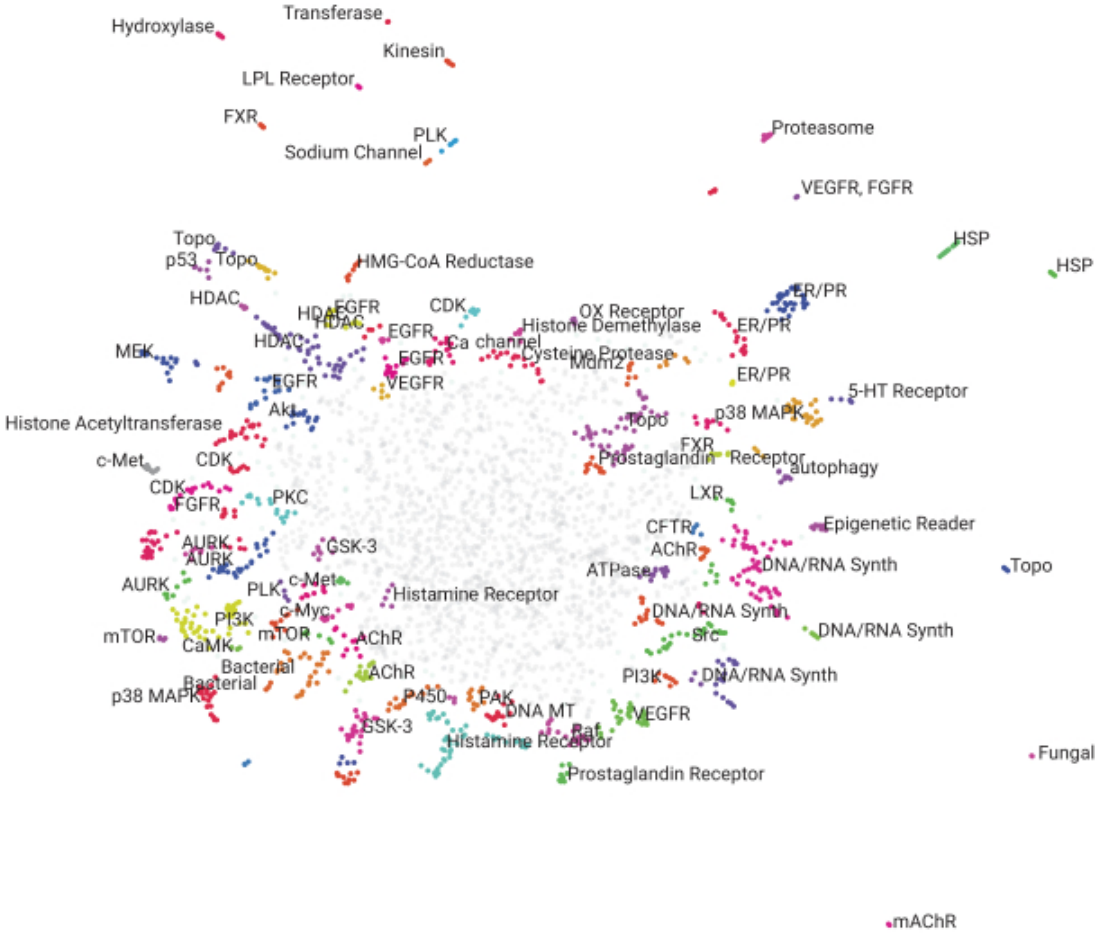


Figure 37. Compounds with the same mechanism cluster together phenotypically. A UMAP plot where each dot represents a different compound. Compounds that are phenotypically similar reside closer together and recapitulate mechanistic similarities (as labeled).

Step 4: Optimize Validated Compounds into Viable Drug Candidates. While a compound may be active in our screens, most early therapeutic starting points have low potency and undesirable drug properties and must be optimized before advancing into *in vivo* and ultimately human studies. During the lead optimization process, our chemists rely upon our phenomics platform to repeatedly measure changes in compound potency that result from changes in compound structure.

Because this process may extend over several months, it is critical that our platform assay is highly stable over time. To test this, we ensure that our assay can reproduce specific measures of compound activity, such as a compound's EC50 (the concentration of a drug that gives half-maximal response) or max-effect (the maximal response), in experiments run weeks, or even months, apart.

In the example below, we ran four separate experiments of a HIF2a inhibitor known to be active against our *VHL* disease model over a period of three months. Dose-response curves across all four runs demonstrate a high degree of overlap, including highly similar EC50s and max-effect. Our calculated minimum significance ratio from this study, a common industry metric of *in vitro* assay reproducibility over time, is 1.076, highly robust by industry benchmarks[5]. These results demonstrate the stability of our assay and the ability to use our phenomic platform as a basis for SAR as we progress programs.

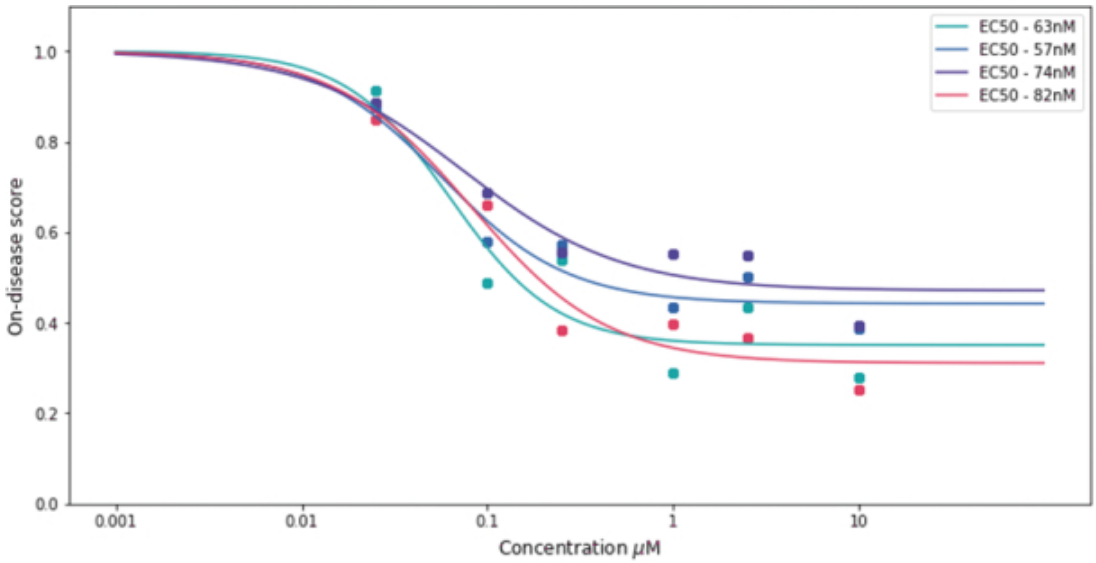


Figure 38. Compound activity is reproducible across experimental runs. Dose response curves from multiple runs of the same tool compound against our disease model for *VHL* loss-of-function shows high consistency, with a calculated tool compound minimum significance ratio of 1.076.

Step 5: Select and Advance Drug Candidates into Clinical Trials. After optimizing early therapeutic starting points into viable drug candidates, we select those compounds that have the best chemical properties to advance as development and ultimately clinical candidates. We have built the internal capabilities to drive clinical candidates through IND-enabling studies, regulatory approval processes, and into human clinical studies. Collectively, members of our development team have been involved in over 100 clinical studies, including recently completing our first SAD in 2019 and MAD studies in 2020. Additionally, we work closely with a team of external consultants across regulatory, CMC, and clinical operations to ensure execution success.

Our People and Culture

We operate at the intersection of multiple fields of cutting-edge science and technology, creating an environment where empirical data, statistical rigor and creative thinking are brought to bear on decisions. Our diverse team of Recursionauts, now composed of more than 200 full time employees, is united by our growth-mindset, mission-driven commitment and an inclusive culture. Our cross-disciplinary workforce is balanced across biology, drug-hunting and chemistry (approximately 40% of our employees) alongside experts in software engineering, automation engineering and data science

5 Haas JV, Eastwood BJ, Iversen PW, et al. Minimum Significant Ratio – A Statistic to Assess Assay Variability. 2013 Nov 1 [Updated 2017 Nov 20]. In: Markossian S, Sittampalam GS, Grossman A, et al., editors. Assay Guidance Manual [Internet]. Bethesda (MD): Eli Lilly & Company and the National Center for Advancing Translational Sciences; 2004.

(approximately 35% of our employees). Our project teams are cross-functional whenever and wherever appropriate. Our value “One Recursion” reinforces this important, company-first, function-second mindset that is essential to maximize the effectiveness of the Infrastructure Layer, and effectiveness of the Recursion OS as a whole.

Given the rate at which the Recursion OS advances, combined with the growth trajectory of the company, an environment of learning and teaching is critical to our success. Our people systems, processes, and rituals have been designed to specifically reinforce these behaviors. For example, our performance and development system is anchored around three questions to assess performance that are tied to our Values: i) What was Delivered, ii) What was Learned, and iii) What was the Impact on Others? Another cultural dimension that is a critical enabler of the Infrastructure Layer and Recursion OS overall is our willingness to be bold and ambitious, captured in our value “Act Boldly with Integrity”. Underlying this value has long been an approach of taking bold bets in pursuit of our mission, to accelerate progress; we lean into change that will propel us, with regularity.

Our Culture

Culture is our character and personality; it is the sum of our values, traditions, beliefs, behaviors, and attitudes. We have intentionally sought extraordinary talent and created an environment where our Recursionauts can do their best work. Our deliberate approach is critical to our future success because of the audacity of our mission and building an industry-defining company headquartered in Salt Lake City. Our culture is defined by an incredibly diverse, committed, ambitious, purpose-driven, and talented group of people that come to the table with curiosity, humility, kindness, and respect. People systems and company rituals reinforce the behaviors that bring our culture to life. Ultimately our greatest strength is in our differences: expertise, gender, race, disciplines, experience, and perspectives.

Our Values. Values are the core behaviors that define our culture. Our values are incredibly important to us because they are the simplest definition of how we will achieve our mission.

Figure 39. Our Five Value Pillars. Our values are the core behaviors that define our culture.

We Care. We care about our drug candidates, our Recursionauts, their families, each other, the communities in which we live and work, and we care deeply about the patients we aim to serve and their loved ones. We also care about our work; we operate with an owner's mindset. We care so much that we are willing to do and say the hard things to make each other and the company better. An example of our caring is we pay 100% of the health premiums for all Recursionauts and their families and provide substantial mental health benefits, believing that everyone should have fair access to healthcare so they can be well and in turn work towards serving our mission.

We Learn. Learning from the diverse expertise and perspectives of our fellow Recursionauts, and from failure, is an essential part of how we make progress. We seek to create cross-functional teams so that we can teach and learn about the myriad ways to approach the problems we tackle. We expect everyone to be learning at the rate of growth of the company. We have never been static, nor should we be. This value is exemplified by the time we make for journal clubs and even a '101' lecture series where some of our brightest and most accomplished Recursionauts regularly teach introductory classes on their field to new employees (or any employee who wants to brush up their skills).

We Deliver. We are unapologetic that our expectations for delivery are extraordinarily high. We have the potential to radically improve the lives of millions of people, and we do not want any of them to wait a day longer than is necessary. There is urgency to our existence. The deep caring for our people is an enabler for them to rise to these expectations. This value is exemplified by this document and all we have built since our founding in November 2013.

We Act Boldly with Integrity. No company changes the world or reinvents an industry without being bold. Part of being bold is creating a culture where failure is embraced if it leads to learning and growth. We dare greatly, rather than celebrate the more moderate successes that could be within our reach if we relaxed our ambition. Boldness, however, must be balanced; not by timidity, but by acting with integrity and doing the right thing even when no one is looking. We lead with data, optimize relationships for the long-term, and aim for the highest levels of integrity in everything we do. The best example of this value is the breadth of our mission, the progress we have made against it, and the data we have to back-up that progress and our claims. Another strong example of our high integrity approach stems from when we updated our new hire equity guidelines last year. Rather than act on a go-forward basis, we went back to 'make whole' every single Recursionaut whose new hire grant was less than the new guidelines.

We Are One Recursion. We operate with a 'company first, functions second' mentality. We do what is best for the mission, regardless of whether it is the optimal outcome for ourselves or our functional team. Our success comes from working as one interdisciplinary team. This value is exemplified by leaders and employees being consistently willing to 'give-up' power, control or responsibility in favor of another when it means the mission can be advanced.

Other Key Drivers of our Culture. Being Utah-based has a positive impact on our culture, marrying loyalty, grit, kindness, and respect with the relentless pursuit of our ambitions, all outside of traditional echo-chambers. This powerful combination fuels a durable commitment to our values and is an accelerator towards our mission. In our latest employee engagement survey, we achieved 83% engagement which was more than ten points higher than the Tech, Science, and Research benchmark we use. Engagement, akin to motivation, is an industry standard index score that research shows is a driver of performance and business results. As a company, we target a high but balanced engagement score of 75-85% so that we can be confident in the health of our organization, while acknowledging some amount of friction as we move and change at a relentless pace. Over-indexing on engagement above 85% could come at the cost of delivering for other stakeholders in the business such as our partners, shareholders or the patients we aim to serve.

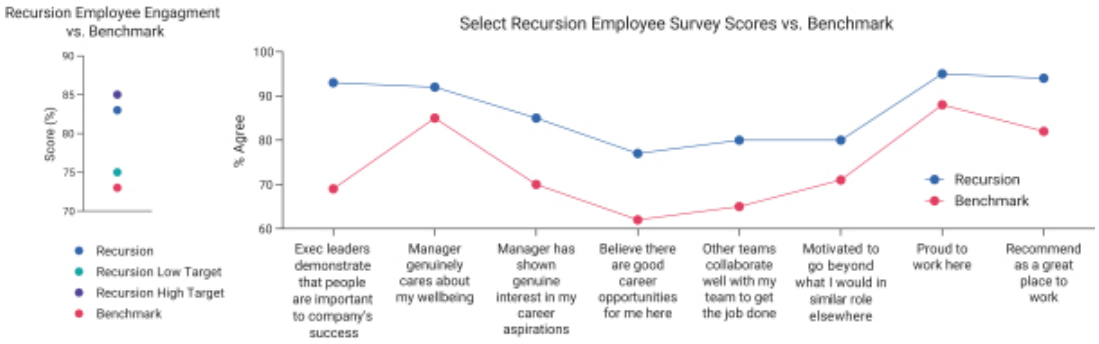


Figure 40. Our employee engagement survey scores exceed industry benchmarks.[6]

To harness the power of our diversity, we put an emphasis on building an equitable and inclusive culture and environment. From onboarding to training to all-hands meetings, we invest in skill-building and use storytelling to foster an inclusive workplace that can be a shared home for our many differences. We make it a point to keep ourselves aware, educated and empathetic to those around us. In a 2020 survey we conducted, 91% of Recursionauts agree that we foster a high integrity environment and 83% felt they could express a contrary viewpoint and still be respected, well above benchmarks to many similarly positioned companies. Hiring, promotion, and pay equity are important to us and we invest in process, training, and analysis to maximize equitable outcomes so that differences are based on the value each employee delivers to the business.

Lastly, the most singular unifying force in our culture is our mission. We bring it to life through Vision Talks by our CEO to every new employee, which all current Recursionauts are always invited to attend, photos of patients that we have gotten to know around our facility, invited lectures by leading scientists, patients, patient advocates, and other stakeholders, and more. We are a mix of professionals that have chosen a professional path of meaning, some earlier, and some later, in their careers. 2020 only amplified our collective desire for purpose and it highlighted the importance of healthcare in our lives and in the economy and the profound recognition that new approaches are necessary. This fuels us, and our future Recursionauts.

Our People

As of January 14, 2021, we employed 209 people and are growing rapidly. Our team is highly educated and experienced with more than 25% having advanced technical degrees (e.g., M.D. or Ph.D.) and collective experience contributing as core team members to 53 marketed drugs and 77

6 Our benchmark is derived from over 20,000 survey responses from comparable companies during the 12 months ended December 31, 2019.

clinical stage molecules. Our team is also highly cross-functional with about as many data scientists and engineers (approximately 35% of our employees) as biologists and chemists (approximately 40% of our employees). The majority of our employees work from our headquarters in downtown Salt Lake City. We also have an *in vivo* scientific team at our vivarium in Milpitas, California as well as a few remote employees, particularly in data science, ML, and computational chemistry. The team has diverse experience across best-in-class global corporations and institutions in life sciences, technology, and business.

As of January 14, 2021, more than 30% of our workforce had moved to Utah to join us, drawn by our mission, science, technology, and culture. Salt Lake City itself has been a draw for many new Recursionauts given its affordability, access to recreation, quality of life, and maturing diversity. We have employed creative means to identify and recruit some of the brightest minds including an ML competition based on the release of our first public dataset, RxRx1, that we hosted in affiliation with NeurIPS, a premier AI conference. In particular, we have been successful in attracting talent from the Bay Area which hosts a deep talent pool in both tech and biotech.

We are deeply committed to building a diverse organization. Numerous studies have concluded that diverse teams outperform homogeneous teams. Today our workforce is approximately 40% women, and we continue to strive to improve gender and racial diversity at all levels. We have values and processes that are designed to achieve our diversity, equity, and inclusion ambitions in the service of achieving our mission. For example, we have focused on including non-binary and BIPOC (Black, Indigenous or Person of Color) individuals and women in both the panel of interviewers and the slate of candidates for all new hires. Our progress has been noted locally as a three-time ‘Shatter Award’ recipient from the Women Tech Council of Utah.

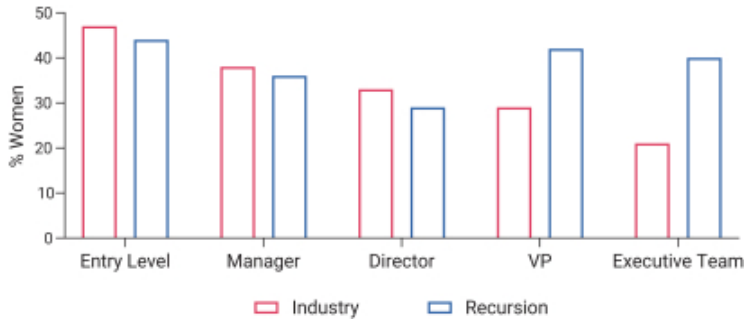


Figure 41. Representation of women by level at Recursion significantly outperforms the average corporate pipeline, in which female representation narrows at more senior levels.[7]

Lastly, despite incredible growth, we are intentional about developing our talent not just from external sources, but through promotion and mobility of our internal team. The inherent complexity and evolution of the Recursion OS results in value being placed on the institutional knowledge that comes with time at Recursion. Part of the value proposition of being a Recursionaut is that your career will grow. Notably, 20% of our executive team are products of internal mobility, having joined as individual

7 Adapted from 2020 Lean In McKinsey Women in the Workplace Report.

contributors and grown into executive roles with the company. In 2020, we had 38 employees move into new roles with more responsibility.

Pipeline

We have used the Recursion OS to generate a pipeline of 35 internally-developed programs. Our programs target diseases spanning several therapeutic areas where: i) the cause of the disease is well-defined and ii) there is high unmet need, there are no approved therapies, or there are significant shortcomings with existing treatment paradigms. Several of our programs target indications with market opportunities in excess of $1 billion in annual sales and we are preparing four pipeline programs to enter Phase 2 clinical trials in .

The majority of our late-stage programs were created using 'brute-force search' approaches, where we physically test each combination of disease model and drug candidate in our library using our automated wet-lab infrastructure. In mid-2020, we began transitioning towards a more efficient and more powerful 'inferential search' approach. Under this new paradigm, we independently profile thousands of disease models and hundreds of thousands of drug candidates and then infer tens of billions of biological and chemical relationships *in silico*, prioritizing the most promising candidates for follow-on validation. The majority of our emerging, early discovery stage programs were created using inferential search tools and, moving forward, we expect this approach will generate the vast majority of new additions to our pipeline.

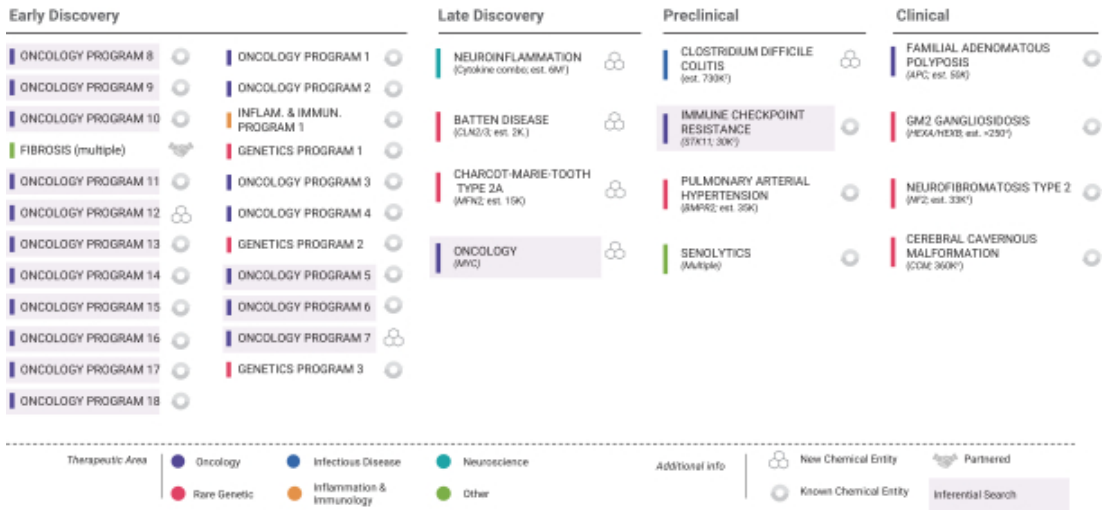


Figure 42. The power of the Recursion OS is exemplified by the breadth of active research and development programs. 35 programs spanning multiple therapeutic areas and consisting of both new uses for existing compounds and NCEs under active research and development. (1)Our program has the potential to address a number of indications within Neuroinflammation, including multiple neurodegenerative diseases totaling at least 6M patients in the US. We intend to pursue a select subset of these indications in the future. (2)730,000 annual incidence in US-EU5. Initial clinical studies will focus on subsets of the total population with high rates of recurrent infection. (3)Annual US-EU5 incidence (4) Worldwide prevalence (5) Annual US-EU5 incidence for all *NF2*-driven meningiomas (6) Hereditary and sporadic symptomatic population.

Notable Programs

We consider ten 'Notable Programs' to be key, near-term value-drivers.

Eight of our Notable Programs were discovered using our brute-force search approach:

- REC-4881 for the treatment of familial adenomatous polyposis, or, FAP—expected Phase 2 initiation in
- REC-3599 for the treatment of GM2 gangliosidosis, or GM2—expected Phase 2 initiation in
- REC-2282 for the treatment of neurofibromatosis Type 2, or NF2—expected Phase 2 initiation in
- REC-994 for the treatment of cerebral cavernous malformation, or CCM—expected Phase 2 initiation in
- Lead molecules for the treatment of *C. difficile* colitis—preclinical
- Lead molecules for the treatment of neuroinflammation—late discovery
- Lead molecules for the treatment of Batten disease—late discovery
- Lead molecules for the treatment of Charcot-Marie Tooth type 2a disease, or CMT2A—late discovery

Following closely are two Notable Programs discovered and rapidly advancing using our inferential search approach:

- REC-64151 for the treatment of STK11 immune checkpoint resistance in STK11-mutant non-small cell lung cancer—preclinical
- MYC inhibitory molecules for the treatment of solid and hematological malignancies—late discovery

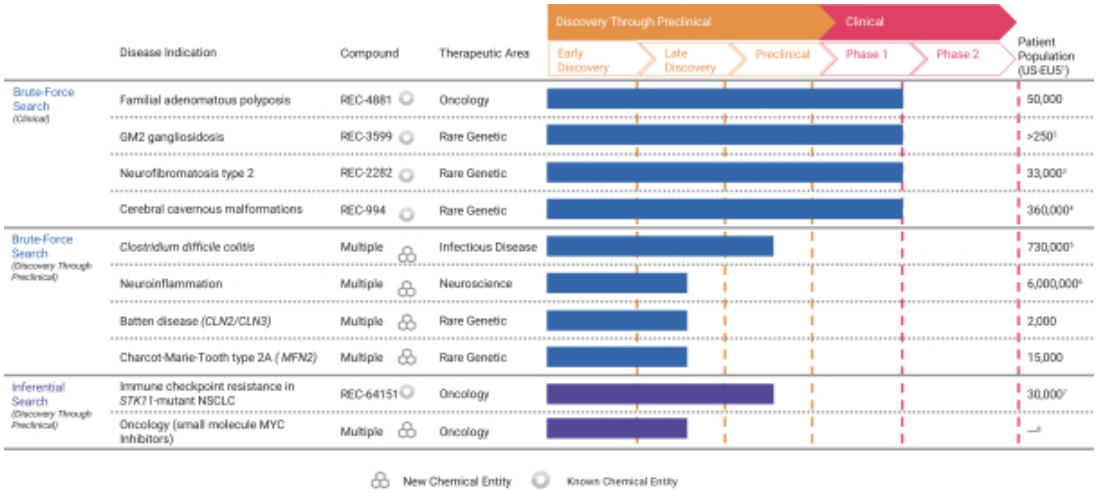


Figure 43. Notable Programs within our pipeline. Notable Programs are key, near-term value drivers for us given their market opportunities and the validation that they provide. Our four lead programs are poised to enroll patients in Phase 2 clinical trials in 2021 while preclinical programs are rapidly progressing. (1)EU5 is defined as France, Germany, Italy, Spain and the United Kingdom. All

numbers are prevalence unless otherwise noted. (2)Worldwide prevalence. (3)Annual US-EU5 incidence for all NF2-driven meningiomas. (4)Hereditary and sporadic symptomatic population. (5)730,000 annual incidence in US-EU5. Initial clinical studies will focus on subsets of the total population with high rates of recurrent infection. (6)Our program has the potential to address a number of indications within Neuroinflammation, including multiple neurodegenerative diseases totaling at least 6 million patients in the US. We intend to pursue a select subset of these indications in the future. (7)Annual US-EU5 incidence. (8)Our program has the potential to address a number of indications driven by *MYC* alterations. At this time, we have not finalized a target product profile for a specific indication.

REC-4881: Familial Adenomatous Polyposis

Summary

REC-4881 is an orally bioavailable, non-ATP-competitive allosteric small molecule inhibitor of MEK1 and MEK2 being developed to reduce tumor size in FAP patients and patients with somatic *APC*-mutant tumors. REC-4881 has been well tolerated consistent with the intended use and a gut-localized PK-profile in humans that is highly advantageous for FAP, and *APC*-driven gastrointestinal tumors. We expect to enroll the first patient in a Phase 2, double-blind, randomized, placebo-controlled trial in .

Disease Overview

FAP is a rare tumor syndrome affecting approximately 50,000 patients in the US and EU5 with no approved therapies. FAP is caused by autosomal dominant inactivating mutations in the tumor suppressor gene *APC*, which encodes a negative regulator of the Wnt signaling pathway. FAP patients develop polyps and adenomas in the colon, rectum, rectal pouch, stomach, and duodenum throughout life. These growths have a high risk of malignant transformation and can give rise to invasive cancers of the colon, stomach, duodenum, and rectal tissues. Standard of care for patients with FAP is colectomy in late teenage years. Without surgical intervention, affected patients will progress to colorectal cancer by early adulthood. Post-colectomy, patients receive endoscopic surveillance every 6-12 months to monitor disease progression.

Despite surgical management, the need for effective pharmacological therapies for FAP remains high due to continued risk of duodenal and desmoid tumors post-surgery. These tumors occur in the majority of patients and surgical resection of these tumors can be associated with significant morbidity. NSAIDs, such as sulindac or celecoxib, are sometimes used to treat these tumors, but have limited efficacy and do not impact precancerous lesions. While surgical management and surveillance have improved the prognosis for FAP patients, desmoid tumors remain a major cause of death in patients with FAP following colectomy.

Product Concept

Our REC-4881 candidate is an orally bioavailable, non-ATP-competitive allosteric small molecule inhibitor of MEK1 and MEK2 (IC50 2-3 nM and 3-5 nM, respectively) that has demonstrated potent reduction in polyps and dysplastic adenomas, compared to the NSAID celecoxib, in the *Apcmin* mouse model of FAP. In a previous Phase 1 study run by Millennium Pharmaceuticals, 51 patients with solid tumors were treated with REC-4881 and did not demonstrate the typical ocular toxicities associated with this class. REC-4881 exhibits extremely low hepatic metabolism and its primary route of

elimination is through biliary excretion, which may allow it to achieve preferential exposure at tumor sites in the duodenum and lower gastrointestinal tract with reduced systemic exposures and toxicity. We obtained a global license for REC-4881 from Takeda Pharmaceuticals in May 2020. We plan to seek orphan drug designation for REC-4881 in FAP and *APC*-driven tumors.

Preclinical

The novel use of REC-4881 for FAP was discovered using our brute-force search approach leveraging knock-down of the FAP disease gene *APC* in human cells. We validated our findings using tumor cell lines and spheroids grown from human epithelial tumor cells with a mutation in *APC*. REC-4881 inhibited both the growth and organization of spheroids in these models and, in tumor cell lines, had well over a 1,000-fold selectivity range in cells harboring *APC* mutations.

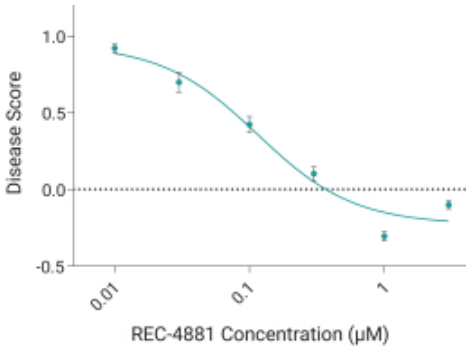


Figure 44. Platform rescue of *APC* model by REC-4881. REC-4881 rescued the effects of knockdown of *APC* in human cells using our phenomics assay.

We subsequently evaluated REC-4881 in a disease relevant preclinical model of FAP. Mice harboring truncated *Apc*, or *Apc*^{min}, were treated with multiple oral daily doses of REC-4881 or celecoxib over an eight-week period. Mice treated with celecoxib had approximately 30% fewer polyps than did those treated with vehicle, whereas mice treated with 1 mg/kg or 3 mg/kg REC-4881 exhibited approximately 50% fewer polyps than vehicle-treated mice. Mice that were treated with 10 mg/kg REC-4881, the highest dose tested, exhibited an approximately 70% reduction in total polyps.

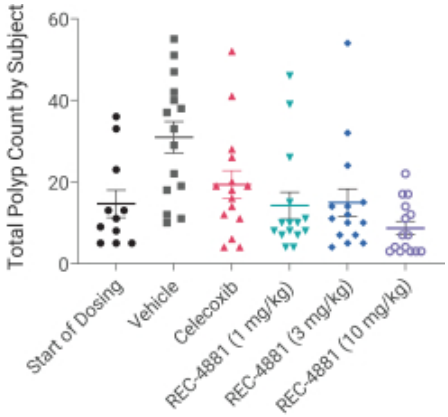


Figure 45. REC-4881 reduces GI polyp count in the *Apc*^{min} mouse model of FAP. GI polyp count after oral administration of indicated dose of REC-4881, celecoxib, or vehicle control for 8 weeks.

Polyp count at start of dosing reflects animals sacrificed at the start of study (15 weeks of age). $P < 0.001$ for all REC-4881 treatment groups versus vehicle control.

In FAP, polyps arising from mutations in *APC* may progress to high-grade adenomas through accumulation of additional mutations and eventually to malignant cancers. To evaluate the activity of REC-4881 on both benign polyps and advanced adenomas, gastrointestinal tissues from mice treated with REC-4881 were histologically evaluated and polyps were classified as either benign or high-grade adenomas. While celecoxib reduced the growth of benign polyps in the model, a large proportion of polyps that remained were dysplastic. By contrast, treatment with REC-4881 specifically reduced not only benign polyps, but *also* precancerous high-grade adenomas, a finding with the potential for translational significance.

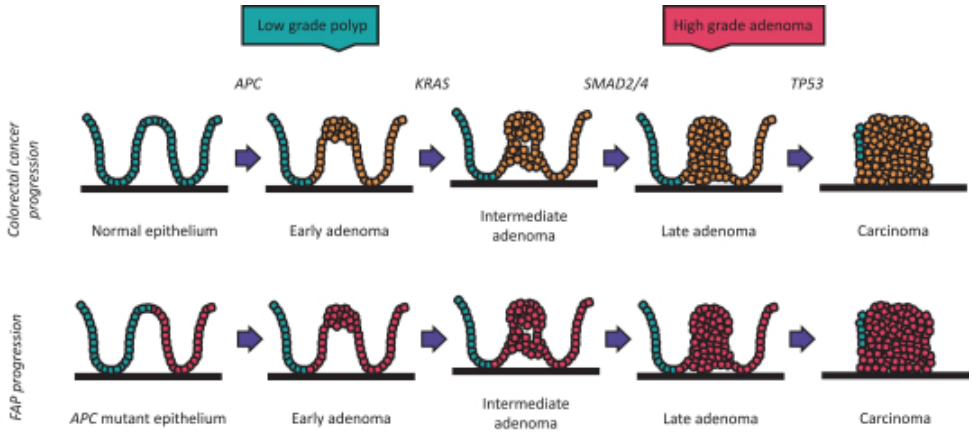


Figure 46. Disease progression of FAP begins with mutations in *APC*. Progression of benign *APC*-mutant polyps to high-grade adenomas and eventually malignant tumors occurs following the accumulation of additional genetic alterations[8].

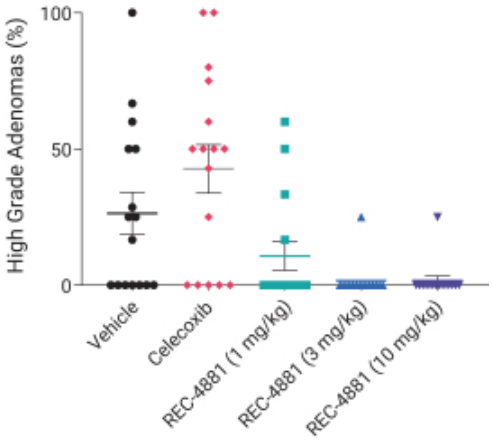


Figure 47. REC-4881 reduces high-grade adenomas in the *Apc$_{min}$* mouse model of FAP. Quantification of high grade adenomas versus total polyps based on blinded histological review by a

8 Adapted from http://syscol-project.eu/about-syscol/

pathologist. While celecoxib reduces benign polyps, the majority of remaining lesions are high grade adenomas. By contrast, REC-4881 reduces both polyps and high grade adenomas.

REC-4881 is a non-ATP-competitive and specific allosteric small molecule inhibitor of MEK1 and MEK2. Studies have shown that mitogen-activated protein kinase signaling, or MEK, and extracellular signal-regulated kinase, or ERK signaling is activated in adenoma epithelial cells and tumor stromal cells, including fibroblasts and vascular endothelial cells. In addition, genomic events resulting in alteration of mitogen-activated protein kinase signaling, or MAPK, such as activating mutations in *KRAS*, are frequent somatic events that promote the growth of adenomas in FAP. Therefore, suppression of aberrant MAPK signaling in adenomas of FAP with REC-4881 has the potential to regress or slow the growth of these tumors by acting on core pathways driving their growth.

Clinical

We plan to initiate a Phase 2 clinical trial in FAP in .

Millennium Pharmaceuticals previously conducted clinical work including human exposure using REC-4881, then referred to as TAK-733. A total of 51 patients were included in the Phase 1 study, which demonstrated that REC-4881 had a manageable toxicity profile up to the maximum tolerated dose, or MTD, of 16 mg dosed on days one to 21 of 28-day treatment cycles. The most common adverse events were dermatitis acneiform rash (53%), fatigue (36%), and diarrhea (31%), consistent with other MEK inhibitors. No dose-limiting toxicities, or DLTs, were observed in patients who received REC-4881 in the first eight dose cohorts (0.2 - 8.4 mg). Four patients experienced DLTs of grade 3 dermatitis acneiform at doses of 12 mg (n=1), 16 mg (n=1), and 22 mg (n=2). Importantly, REC-4881 demonstrated a favorable ocular safety profile compared to approved drugs in this class. Our preclinical data in FAP support a low dose cohort in the Phase 2 in the dosing range where DLTs were not experienced in the prior Phase 1 (0.2 - 8.4 mg).

We plan to initiate a Phase 2, randomized, double-blind, placebo-controlled study to evaluate efficacy and safety of REC-4881 in classical FAP patients and non-FAP patients with upper and lower gastrointestinal polyposis with confirmed somatic APC mutations. We expect to initiate a Phase 2 clinical trial later in .

- The study will be conducted in classical FAP or non-FAP patients with tumors with somatic APC mutation who are at or over 18 years of age at the time of enrollment.
- Patients will be randomized into two active and one placebo group and treated for 24 weeks with an extension period of 24 weeks.
- The study will assess tumor response endpoints in patients treated with REC-4881 versus placebo.

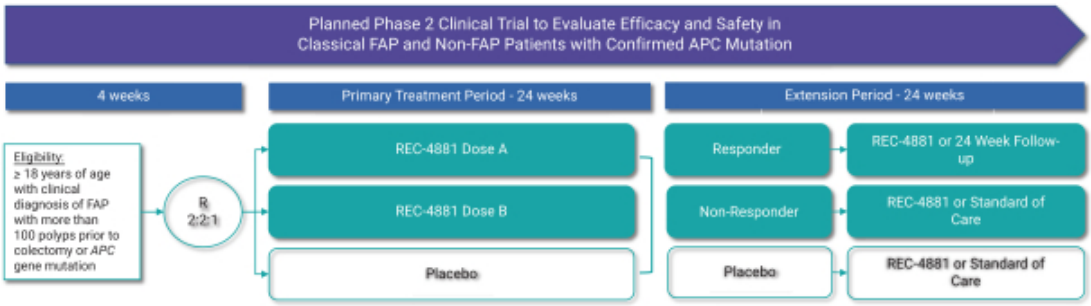


Figure 48. Clinical trial schematic for REC-4881. Planned Phase 2 clinical trial to assess the efficacy and safety of REC-4881 in patients with classical FAP and non-FAP patients with upper and lower gastrointestinal polyposis.

Key Competitors

There are four therapeutic approaches in clinical development for FAP; all are focused on reduction in colorectal polyposis.

- Guselkumab is an IL-23 human monoclonal antibody, or mAb, in Phase 2 development by Janssen Pharmaceuticals which is hypothesized to reduce cytokine production, inflammation, and tumor polyp development.
- Eicosapentaenoic acid-free fatty acid is a polyunsaturated fatty acid currently in Phase 3 development for FAP by S.L.A. Pharma AG. Eicosapentaenoic acid-free fatty acid is hypothesized to reduce polyp formation due to its activity as a competitive inhibitor of arachidonic acid oxidation.
- A combination of Eflornithine and sulindac is in development by Cancer Prevention Pharma for FAP and, in a recent Phase 3 study, the incidence of disease progression with the combination was not significantly lower than either drug alone.
- Encapsulated rapamycin, or eRAPA, is currently in Phase 2 development for FAP and is hypothesized to reduce tumor formation through its inhibitory effect on the mTOR pathway.

In contrast to other active clinical studies in FAP, our REC-4881 program will include patients with both benign polyps and dysplastic adenomas as supported by preclinical data demonstrating benefit in preventing growth of both types of tumors.

REC-3599: GM2 Gangliosidosis

Summary

REC-3599 is an orally bioavailable, selective, potent small molecule inhibitor of Protein Kinase C, or PKC, and GSK3ß being developed for the treatment of GM2. REC-3599 has demonstrated strong rescue of pathogenic biomarkers GM2 and lipofuscin levels in cells derived from patients with multiple different mutations in either *HEXA* or *HEXB,* referred to as Tay-Sachs or Sandhoff Disease, respectively. We are currently generating additional pharmacodynamic data in an animal model of *GM2* at the request of the FDA in anticipation of enrolling the first patient in an open-label Phase 2 trial in .

Disease Overview

GM2 is a lysosomal storage disease affecting more than 250 patients worldwide. The disease is caused by mutations in either *HEXA* or *HEXB* genes which encode subunits of the lysosomal beta-hexosaminidase enzyme. GM2 presents during infancy, childhood, or later in life depending upon the degree of genetic deficiency and is classified by the period of onset: Infantile onset, Juvenile onset, and Late-onset Tay-Sachs or Sandhoff Disease. Patients with infantile GM2 are diagnosed in the first year of life and exhibit rapidly progressing neurological decline, associated with neuronal lysosomal dysfunction and GM2 accumulation, resulting in complete neurological disability and premature death in the first few years of life. Some of the earliest observed signs include retinal abnormalities and exaggerated startle reflex within the first six-months after birth. Affected infants may achieve some

motor milestones at close to expected normal developmental age up to about 12-months; however, they will ultimately lose any gained motor skills, including basic skills such as the ability to turn over, sit, crawl, and swallow, by the age of 18-24 months and usually succumb to their disease prior to age four. There are no approved disease modifying treatments for the disease. Standard of care for these patients is supportive interventions, including seizure control with anticonvulsants, assisted feeding through a nasogastric tube, or percutaneous endoscopic gastrostomy, and, ultimately, ventilatory support. While progression of the disease remains rapid, supportive care can provide some improvement in survival of patients with infantile GM2.

Product Concept

We are developing a first-in-class small molecule therapeutic as monotherapy or in combination with gene therapy to slow progression of neurological decline in patients with GM2. REC-3599 is an orally bioavailable, CNS-penetrant small molecule inhibitor of PKCß with additional inhibitory activity on GSK3ß. In preclinical studies, REC-3599 demonstrated potent reduction of GM2-ganglioside accumulation and sphingolipid-associated autofluorescence in patient-derived fibroblast models at IC50s suitable for human dosing of infantile GM2-harboring *HEXA* and *HEXB* mutations. REC-3599 is hypothesized to play a dual role in modulating lysosomal biogenesis through inhibition of GSK3ß while also stimulating cellular autophagy through inhibition of PKCß. Eli Lilly previously studied REC-3599, then referred to as ruboxistaurin, in diabetic retinopathy, including a Phase 3 clinical trial. The compound has been dosed in over 2,500 adult human subjects with treatment durations as long as two years. REC-3599 has been well tolerated in adult human subjects, supporting its evaluation in this rare and devastating infantile neurological disease. We are currently executing the relevant *in vivo* pharmacodynamic study and juvenile rodent toxicology studies at the request of the FDA to help bridge entry into pediatric populations. In 2015, Eli Lilly out-licensed the rights for ruboxistaurin to Chromaderm; we subsequently licensed the global rights to ruboxistaurin from Chromaderm for all systemic uses in December 2019, which we are developing as REC-3599. We obtained pediatric rare disease designation for REC-3599 in GM2 in 2020. We plan to seek orphan drug designation for REC-3599 in GM2.

Preclinical

The novel use of REC-3599 for GM2 was discovered using our brute-force search approach leveraging knockout of the GM2 disease gene *HEXB* in human cells.

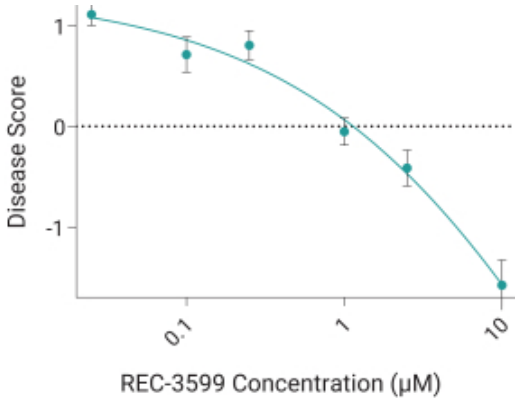


Figure 49. **Rescue of *HEXB* model by REC-3599.** REC-3599 rescued the effects of knockout of *HEXB* in human cells using our phenomics assay.

In Tay-Sachs and Sandhoff diseases, the loss of function of ß-hexosaminidase results in the accumulation of GM2 gangliosides and lipofuscin in the lysosome. Exposure of GM2 patient fibroblast lines to REC-3599 resulted in a reduction in GM2 ganglioside aggregates, total GM2 levels, and lipofuscin-associated autofluorescence to levels comparable to apparently healthy control-derived fibroblast lines. These data are consistent with an improvement in lysosomal function resulting from REC-3599 exposure.

REC-3599 was initially developed as an inhibitor of PKCß; however, the compound also demonstrates weaker but significant inhibitory activity against GSK3ß. GSK3ß is a known inhibitor of lysosomal biogenesis, and inhibition of GSK3ß has been shown to lead to increased lysosomal production and function by activating transcription of lysosomal genes regulated by transcription factor TFEB. Additionally, inhibition of GSK3ß leads to pro-survival autophagic signaling through TFEB. In parallel, results support the role of PKCß as an inhibitor of cellular autophagy, a key cellular process in lysosomal-mediated degradation that is impaired in lysosomal storage diseases. Thus, the dual action of REC-3599 in modulating lysosomal biogenesis through inhibition of GSK3ß while also stimulating cellular autophagy through inhibition of PKCß, may underlie the unique activity of REC-3599 in human cellular models of GM2.

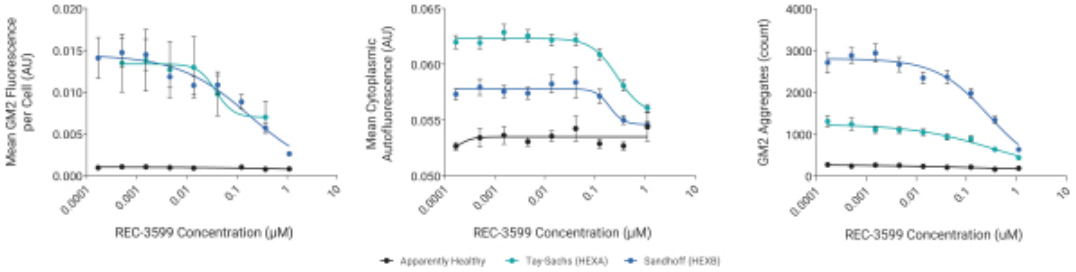


Figure 50. Patient cells show reduced disease-specific activity when treated with increasing REC-3599. Tay-Sachs and Sandhoff disease patient fibroblasts exhibit higher: mean GM2 fluorescence (left panel), aggregate counts (middle panel), and autofluorescent substrate accumulation (right panel).

Clinical

We are planning to initiate a Phase 2 clinical trial in Infantile GM2 in .

Previous clinical work conducted by Eli Lilly includes considerable human exposure to REC-3599, previously referred to as ruboxistaurin. A total of 26 studies in adult human subjects conducted in the United States, Europe, and Asia have established the absorption, distribution, metabolism, excretion, pharmacodynamics, and tolerability of REC-3599. A total of 3,521 patients were included in the primary safety database (placebo: 1408, REC-3599: 2113) at daily doses of 4, 8, 16, 32, and 64 mg. Of these, 937 patients (placebo: 401, REC-3599: 536) were part of the diabetic retinopathy safety database. The safety of REC-3599 was also evaluated in at least 250 adult subjects in an integrated database of at least 20 clinical pharmacology studies and 86 adult subjects in a thorough QT interval study. In these clinical pharmacology studies, single doses of REC-3599 up to 256 mg and multiple daily doses up to 128 mg given over two weeks were taken by healthy subjects in clinical trials and has been well tolerated by patients on 32 mg REC-3599 with chronic dosing.

Safety information provided in Eli Lilly's NDA 22005 supports the safety profile of REC-3599 in adult patients. The summary of safety conclusions was as follows: Most adverse events were noted to be mild to moderate severity and did not lead to discontinuation of study drug; the safety profile of

REC-3599 was similar regardless of age, gender, ethnicity, and type of diabetes; the incidence of patients with at least 1 serious adverse event, or SAE, was lower in 32 mg REC-3599 treated patients compared with placebo; the pattern of SAEs did not suggest any organ-specific or systemic toxicity. Analyses of laboratory measures, vital signs, and ophthalmic safety assessments revealed no clinically significant safety concerns.

Upon satisfactory completion of in vivo pharmacodynamic studies in the *HEXB* mouse model, we expect to initiate an open-label Phase 2 study evaluating the efficacy, safety and tolerability of daily dosing with REC-3599 in patients with Infantile GM2. We expect to initiate a Phase 2 clinical trial in .

- The study will be conducted in infantile patients with confirmed diagnosis of infantile GM2 and the patient will have achieved at least one specific developmental milestone.
- The study will consist of four periods: screening, dose escalation, treatment and follow-up. The overall study duration is anticipated to be 15 months.
- We will track achievement of development milestones, neurological function and quality of life using established and validated composite scales.

Figure 51. Phase 2 clinical trial schematic for REC-3599. Planned Phase 2 clinical trial to assess the efficacy and safety of REC-3599 in patients with Infantile GM2.

Key Competitors

Key competitors to the REC-3599 program consist of two therapeutic categories, gene therapies and small molecule substrate reduction therapies. Two companies are developing AAV-based gene therapies to restore functional beta-hexosaminidase enzyme by gene delivery:

- Taysha Gene Therapies is developing an AAV-based gene therapy, TSHA-101. The program is currently in Phase 2.
- Sio Gene Therapies is also developing an AAV-based gene therapy, AXO-AAV-GM1/GM2. The program is currently in Phase 1/2.

Two companies are developing small molecule substrate reduction therapies:

- Sanofi is developing Venglustat as an orally bioavailable small molecule hypothesized to reduce substrate accumulation in GM2 and other lysosomal storage diseases. The program is currently in Phase 3 studies in patients with late-onset GM2.
- IntraBio is developing N-Acetyl-L-Leucine as an orally bioavailable amino-acid ester. The program is currently in Phase 2.

While restoration of gene function with gene therapies offers large potential therapeutic benefit for patients with genetic diseases such as GM2, results from other devastating neurological conditions

such as spinal muscle atrophy suggest that, even with an efficacious gene therapy, unmet need is expected to remain high. Thus, we anticipate that multiple disease modifying therapies administered in combination, including gene therapies, may offer the potential for greatest benefit for patients with severe neurological conditions, such as GM2.

REC-2282: Neurofibromatosis Type 2

Summary

REC-2282 is a small molecule HDAC inhibitor being developed for the treatment of NF2. The molecule has been well tolerated, including in patients dosed for multiple years, and potentially reduced cardiac toxicity that differentiates it from other HDAC inhibitors. In contrast to approved HDAC inhibitors, REC-2282 is both CNS-penetrant and orally bioavailable. We expect to enroll the first patient in a Phase 2, double-blind, randomized, placebo-controlled study in .

Disease Overview

NF2 is an autosomal dominant, inherited, rare, tumor syndrome caused by loss-of-function mutations in the NF2 tumor suppressor gene, which encodes the cell signaling regulator protein merlin. Loss of NF2, results in growth of the hallmark tumors that characterize this disease: vestibular schwannomas, or VS, and meningiomas. The tumor types of VS and meningiomas seen in NF2 are among the most common in neuro-oncology. In addition, *NF2* mutations give rise to spontaneous meningiomas, mesotheliomas, and underlie subsets of additional tumor types. Combined, we believe *NF2*-driven vestibular schwannomas and meningiomas occur in approximately 33,000 patients per year.

NF2 patients are diagnosed in their late teens or early 20s and present with hearing loss which is usually unilateral at the time of onset, focal neurological deficits, and symptoms relating to increasing intracranial pressure. Although the course of disease progression is highly variable, most patients are rendered deaf and many will eventually need wheelchair assistance due to progressive neurological decline. Standard of care is surgery or radiosurgery and patients may require multiple operative procedures during their lifetime. Although surgery or radiation can be effective in controlling tumor growth, most surgical procedures result in morbidity related to neurological deficits based on the location of the tumor. Hearing loss, facial nerve palsy, and moderate facial nerve dysfunction are also common surgical outcomes. Radiation can induce malignant transformation which in turn makes surgery more complex. In addition, tumors may recur post-surgical resection along with the growth of new tumors. NF2-associated tumors and treatment related morbidity can lead to earlier than expected mortality. If left untreated, *NF2*-driven tumors can result in death resulting from rising intracranial pressure.

Product Concept

We are developing a first-in-class oral small molecule therapeutic to inhibit the growth of *NF2*-driven meningiomas in patients with familial and sporadic disease. REC-2282, is an orally bioavailable, CNS-penetrating, pan-histone deacetylase, or HDAC, inhibitor with PI3K/AKT/mTOR pathway modulatory activity. By comparison to marketed HDAC inhibitors, REC-2282 is uniquely suited for patients with NF2, and *NF2*-mutant CNS tumors, due to its oral bioavailability and CNS-exposure. NF2 disease is driven by mutations in the *NF2* gene, which encodes an important cell signaling modulator, merlin. Loss of merlin results in activation of multiple signaling pathways converging on PI3K/AKT/

mTOR among others. Human clinical pharmacodynamic data supports the role of REC-2282 in inhibiting activity of multiple aberrant signaling pathways in *NF2*-deficient tumors. HDAC inhibitors induce growth arrest, differentiation, and apoptosis of cancer cells. We obtained a global license for REC-2282 from the Ohio State Innovation Foundation in December 2018. Orphan drug designation for REC-2282 in NF2 has been granted in the US and EU.

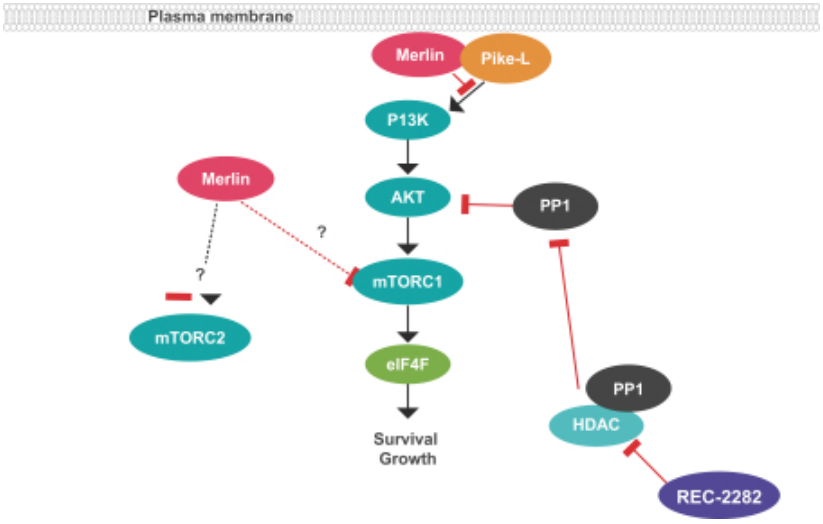


Figure 52. REC-2282 acts on an important pathway in tumor development to inhibit the growth of tumor cells. Mechanism of action of REC-2282 in NF2[9].

Preclinical

The novel use of REC-2282 for NF2 was discovered using our brute-force search approach leveraging the knock-down of the disease gene *NF2* in human cells.

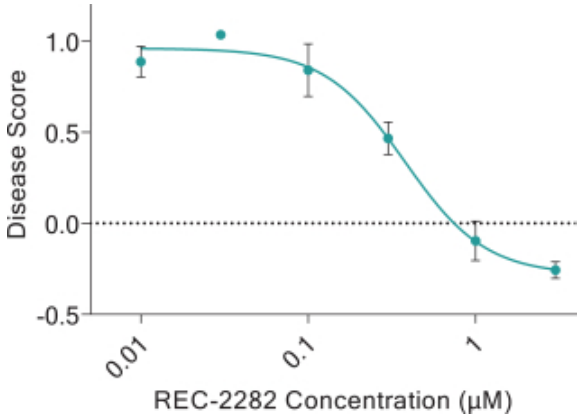


Figure 53. Rescue of *NF2* model by REC-2282. REC-2282 rescued the effects of knock-down of *NF2* in human cells using our phenomics assay.

9 Adapted from Petrilli and Fernández-Valle. Role of Merlin/NF2 inactivation in tumor biology. Oncogene 2016 35(5):537-48

After we discovered the novel use of REC-2282 for NF2 using our platform, we performed a literature search to better understand the molecule and validating disease models. At that time, we discovered that REC-2282 had been shown to inhibit *in vitro* proliferation of vestibular schwannoma, or VS, and meningioma cells by inducing cell cycle arrest and apoptosis at doses that correlate with AKT inactivation. In preclinical models, REC-2282 inhibited the growth of primary human VS and *NF2*-deficient mouse schwannoma cells, as well as primary patient-derived meningioma cells and the benign meningioma cell line, Ben-Men-1.

In animal models of NF2, REC-2282 suppressed *in vivo* growth of an *NF2*-deficient mouse vestibular schwannoma allograft. In addition, REC-2282 suppressed *in vivo* growth human vestibular schwannoma xenograft models in mice fed either a standard diet of rodent chow, or chow formulated to deliver 25 mg/kg/day REC-2282 for 45 days. These animal data served as a functional and orthogonal validation of our platform findings.

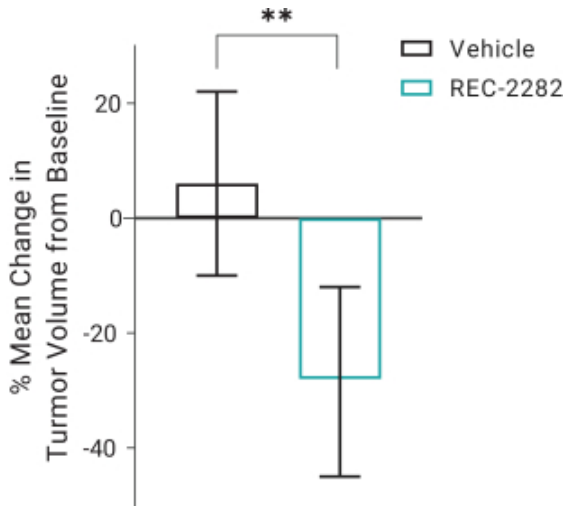


Figure 54. REC-2282 prevents tumor growth in Vestibular Schwannoma xenografts. REC-2282 significantly reduces the mean size of VS xenografts in SCID-ICR mice. Error bars shown are the 95% CI. P=0.006.

Clinical

We expect to initiate a Phase 2 clinical trial in .

Previous clinical work conducted in investigator-initiated trials and trials sponsored by Arno therapeutics includes human exposure to REC-2282, previously referred to as AR-42. A total of three completed studies in adult human subjects were conducted in the United States, in patients with solid or hematological malignancies. A total of 77 patients have been treated with REC-2282 in doses ranging from 20 mg to 80 mg three times a week for three weeks followed by one week off-treatment in four-week cycles. Multiple patients were treated for multiple years using this dosing regimen at the 60 mg dose and the longest recorded treatment duration is 4.4 years at the 40 mg dose. The majority of adverse events were transient cytopenias that did not result in dose reduction or stoppage. The MTD in patients with hematological malignancies and solid tumors was determined to be 40 mg and 60 mg, respectively. The REC-2282 plasma exposure in patients with hematological malignancies and solid tumors generally increased with increasing dose. There were no consistent signs of plasma REC-2282

accumulation across a 19-day administration period nor obvious differences in PK between hematologic and solid tumor patients.

In an Early Phase 1 pharmacodynamic study, REC-2282 suppressed aberrant activation of ERK, AKT, and S6 pathways in vestibular schwannomas resected from treated NF2 patients.

We are planning to initiate a Phase 2, randomized, double-blind, placebo-controlled study to evaluate the efficacy and safety of REC-2282 in patients with progressive meningiomas with underlying NF2 disease and sporadic meningiomas with documented *NF2* mutations. A Special Protocol Assessment, or SPA, has been submitted to the FDA, and we expect to initiate a Phase 2 trial in .

- The study will be conducted in patients with progressive meningioma with NF2 mutations, who are not candidates for surgery within the next three months from screening and who are at least 18 years of age at the time of enrollment.
- Patients will receive REC-2282 for a maximum of 13 cycles; each cycle being four weeks in duration with three weeks of treatment and one week off-treatment. Once a participant completes 13 cycles, they will be followed clinically. If there is progression, then the participant may choose to receive open label REC-2282, if the participant received REC-2282 in double blind period. We plan to conduct an interim and futility analysis at six months into the Phase 2 portion of the study.
- We will assess response to treatment based on objective response rate, or ORR, in target lesions.

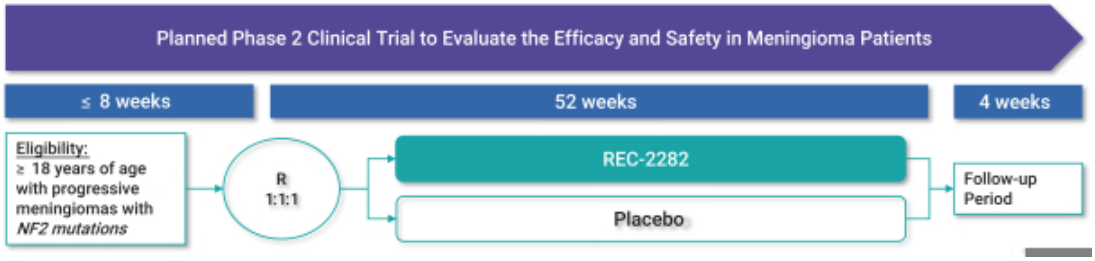


Figure 55. Phase 2 clinical trial schematic for REC-2282. Planned Phase 2 clinical trial design looking at REC-2282 in patients with progressive meningiomas with underlying NF2 disease and sporadic meningiomas with documented *NF2* mutations.

Competitors

There are currently three active programs in clinical development targeting *NF2*-driven brain tumors.

- Brigatinib, an approved ALK inhibitor for NSCLC from Takeda Pharmaceuticals, is in Phase 2 for meningioma, vestibular schwannoma and ependymoma.
- Crizotinib, an ALK/ROS1 inhibitor, is being studied in an investigator sponsored Phase 2 study in progressive vestibular schwannoma.
- Selumetinib, a MEK inhibitor from AstraZeneca, is being studied in a Phase 2 trial for *NF2* related tumors.

Vestibular schwannomas resected from patients treated with REC-2282 demonstrated suppressed activation of multiple aberrant pathways active in these tumors, including ERK and AKT. These results may be difficult to achieve with single pathway inhibitors of ALK or MEK.

REC-994: Cerebral Cavernous Malformation

Summary

REC-994 is an orally bioavailable, superoxide, scavenger, small molecule being developed for the treatment of CCM. In Phase 1 SAD and MAD trials in healthy volunteers directed and executed by us, REC-994 demonstrated excellent tolerability and suitability for chronic dosing. CCM is among the largest rare disease opportunities and has no approved therapies. We expect to enroll the first patient in a Phase 2, double-blind, placebo-controlled, safety, tolerability and exploratory efficacy study in .

Disease Overview

CCM is a disease of the neurovasculature for which approximately 360,000 patients in the United States and EU5 have been diagnosed or suffer symptoms. Less than 30% of patients with CCM experience symptoms, resulting in the disease being severely underdiagnosed. CCM and its hallmark vascular malformations are caused by inherited or somatic mutations in any of three genes involved in endothelial function: *CCM1*, *CCM2*, or *CCM3*. Approximately 20% of patients have a familial form of CCM that is inherited in an autosomal dominant pattern. Sporadic disease in the remaining population is caused by somatic mutations that arise in the same genes. CCM manifests as vascular malformations of the spinal cord and brain characterized by abnormally enlarged capillary cavities without intervening brain parenchyma. Patients with CCM lesions are at substantial risk for seizures, headaches, progressive neurological deficits and potentially fatal hemorrhagic stroke. Current non-pharmacologic treatments include microsurgical resection and stereotactic radiosurgery. Given the invasive and risky nature of these interventions, these options are reserved for a subset of patients with significant symptomatology and/or easily accessible lesions. Rebleeds and other negative sequelae of treatment further limit the effectiveness of these interventions. There is no approved pharmacological treatment that affects the rate of growth of CCM lesions or their propensity to bleed or otherwise induce symptoms. CCM can be a severe disease resulting in progressive neurologic impairment and a high risk of death due to hemorrhagic stroke.

Product Concept

We are developing a first-in-disease, oral, small molecule therapeutic designed to ameliorate neurological symptoms associated with CCM and potentially reduce the accumulation of new lesions. REC-994 is an orally bioavailable small molecule superoxide scavenger with pharmacokinetics supporting once-daily dosing in humans. Mechanistically, reduction of endothelial superoxide species has been shown to ameliorate the cellular pathogenesis of the disease. In addition, REC-994 exhibits anti-inflammatory properties which could be beneficial in reducing disease-associated pathology. Preclinical data have demonstrated benefit on acute to subacute disease-relevant hemodynamic parameters such as vascular permeability and vascular dynamics. Chronic administration in rodent genetic models of CCM has demonstrated long-term benefit in reduction of lesion number. REC-994 was well tolerated up to 800 mg daily dosing in healthy human subjects enrolled in our Phase 1 study, and there were no severe adverse events at any dose tested. The safety results of the Phase 1 studies we executed support continued evaluation of REC-994 in a Phase 2 study. We licensed global rights for REC-994 from the University of Utah in February 2016 and have obtained orphan drug designation in the US and EU.

Preclinical

The novel use of REC-994 for CCM was discovered using our brute-force search approach leveraging knock-down of the disease gene *CCM2* in human cells. In secondary orthogonal assays,

REC-994 reversed defects in human endothelial cell-cell junctional integrity, a functional phenotype associated with the loss of *CCM2*.

REC-994 was subsequently tested in two endothelial-specific knockout mouse models for the two most prevalent genetic causes, *Ccm1* and *Ccm2*. These mouse models faithfully recapitulate the CNS cavernous malformations of the human disease. Mice treated with REC-994 demonstrated a decrease in lesion number compared to vehicle treated controls. Notably, 24-hour circulating plasma levels of REC-994 in this *in vivo* experiment were consistent with exposures seen in humans at a 200 mg daily dose.

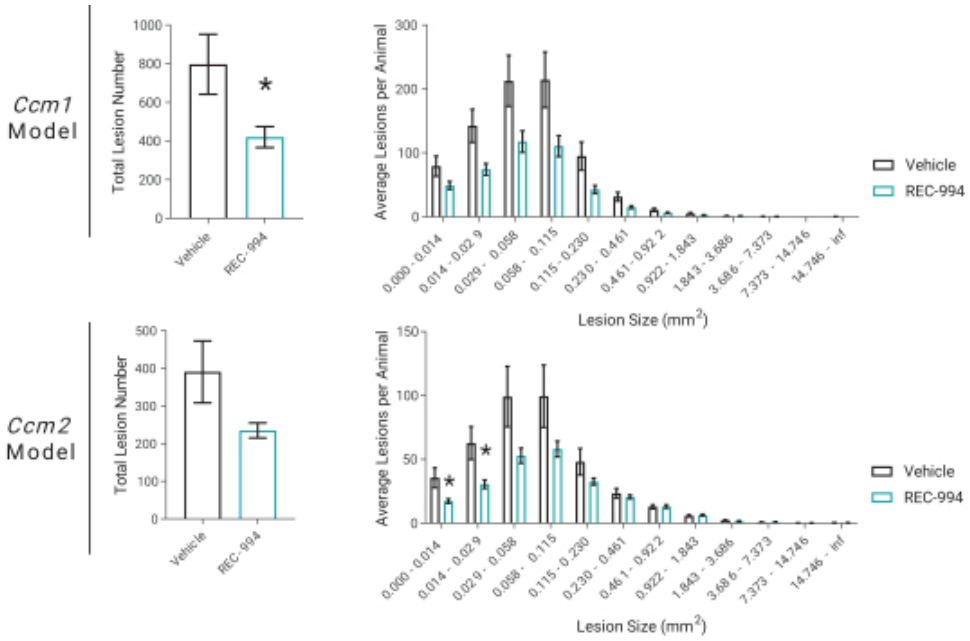


Figure 56. REC-994 reduces lesion severity in chronic mouse models of CCM Disease. Mice treated with REC-994 demonstrated a statistically significant decrease in the number of small-size lesions, with a trend toward decrease in the number of mid-size lesions.

Clinical

We completed Phase 1 SAD and MAD studies in healthy volunteers and expect to initiate a Phase 2 trial in .

We conducted a SAD study in healthy human volunteers using active pharmaceutical ingredients with no excipients in a Powder-in-Bottle dosage form. Results showed that systemic exposure (Cmax and AUC) generally increased in proportion to REC-994 after both single and multiple doses. Median Tmax and $t_{1/2}$ appeared to be independent of dose. There were no deaths or SAEs reported during this study and no TEAEs that led to withdrawal of subjects from the study. These data supported a MAD study in healthy human volunteers.

The MAD study was designed to investigate the safety, tolerability, and PK of multiple oral doses of REC-994, to bridge from the Powder-in-Bottle dosage form to a tablet dosage form, as well as to assess the effect of food on PK following a single oral dose. Overall, multiple oral doses of REC-994

were well tolerated in healthy male and female subjects at each dose level administered in this study. There appeared to be no dose-related trends in TEAEs, vital signs, ECGs, pulse oximetry, physical examination findings, or neurological examination findings.

	Cohort 2: REC-994 50 mg (N=6)	**Cohort 3:** REC-994 200 mg (N=6)	**Cohort 5:** REC-994 400 mg (N=6)	**Cohort 7:** REC-994 800 mg (N=6)	**Cohort 6[a]:** REC-994 800 mg (N=6)
Day 1					
C_{max} (ng/mL)	222.7	626.7 (16.8)	111.3 (43.7)	2686.7 (35.4)	1775.0 (31.9)
T_{max} [b](h)	0.88 (0.50, 2.00)	1.00 (1.00, 2.00)	1.53 (0.75, 4.00)	1.50 (0.75, 4.00)	1.03 (0.75, 4.00)
AUC_{0-24} (h*ng/mL)	1861.0 (34.2)	4939.0 (19.7)	8596.6 (37.3)	23789.1 (32.3)	NA
C_{24} (ng/mL)	23.70 (44.9)	57.52 (39.1)	110.85 (69.6)	284.3 (39.8)	137.80 (35.60)
Day 10					
C_{max} (ng/mL)	128.2 (16.3)	699.2 (24.9)	1138.0 (41.4)	1979.5 (55.2)	1979.5 (55.2)
T_{max} [b](h)	0.750 (0.50, 1.00)	1.500 (0.50, 2.07)	2.000 (0.75, 8.00)	1.500 (1.00, 8.00)	1.500 (1.00, 8.00)
AUC_{0-24} (h*ng/mL)	1092.0 (15.2)	5038.4 (22.1)	9648.7 (26.4)	17541.6 (47.7)	17541.6 (47.7)
C_{24} (ng/mL)	13.67 (26.3)	54.52 (38.2)	107.1 (33.0)	195.7 (62.1)	195.7 (62.1)
$t_{1/2}$ (h)	7.266 (17.6)	7.725 (15.4)	8.541 (10.7)	7.711 (13.1)	7.711 (13.1)

Table 5. Summary Statistics for Plasma REC-994 Pharmacokinetic Parameters – Overall MAD Cohorts.

	Placebo (N=8) n (%)	**REC-994 50 mg** (N=6) n (%)	**REC-994 200 mg** (N=6) n (%)	**REC-994 400 mg** (N=6) n (%)	**REC-994 800 mg** (N=6) n (%)
Total Number of TEAEs	5	0	10	4	15
Total Subjects with at Least One TEAE	4 (50.0)	0	3 (50.0)	3 (50.0)	4 (66.7)
Severity					
Mild	3 (37.5)	0	3 (50.0)	3 (50.0)	3 (50.0)
Moderate	1 (12.5)	0	0	0	1 (16.7)
Severe	0	0	0	0	0
Relationship to Study Drug					
None	3 (37.5)	0	0	2 (33.3)	1 (16.7)
Unlikely	1 (12.5)	0	1 (16.7)	1 (16.7)	2 (33.3)
Possibly	0	0	0	0	0
Likely	0	0	2 (33.3)	0	1 (16.7)
Definitely	0	0	0	0	0
Total Number of SAEs	0	0	0	0	0
Total Subject with at Least One SAE	0	0	0	0	0
Total Subjects who Discontinued Study Drug Due to an AE	0	0	0	0	0

Table 6. Summary of Adverse Events from Phase 1 Multiple Ascending Dose Study. AE=adverse event; MAD=multiple ascending dose; SAE=serious adverse event; TEAE=treatment-emergent adverse event

We plan to initiate an exploratory Phase 2 double-blind placebo-controlled, safety and tolerability study of REC-994 in the treatment of symptomatic CCM.

- The study will enroll patients with symptomatic CCM at least 18 years of age with anatomic CCM lesions demonstrated by MRI.
- The primary objective of the Phase 2 study will be to assess the safety and tolerability of daily dosing of a low and high dose group of REC-994 over 12 months, compared to placebo, in

patients with symptomatic CCM. Exploratory secondary endpoints will include assessment of patient reported outcomes as well as established composite scales for neurological signs and symptoms.

- Currently, there is no development or regulatory precedent or pathway for CCM drug development. We will undertake an exploratory Phase 2 to inform a pivotal trial design with guidance from the FDA. The Phase 2 will explore multiple clinical outcome assessments, including a CCM-specific patient reported outcome assessment developed by us in collaboration with the CCM patient advocacy group, the Angioma Alliance, and the University of Rochester.

Figure 57. Phase 2 clinical trial schematic for REC-994. Planned Phase 2 trial design to assess the efficacy and safety of REC-994 in patients with symptomatic CCM.

Competitors

There are two investigator-initiated clinical studies underway to study marketed therapeutics in CCM patients.

- Investigators at the University of Chicago are evaluating the efficacy of atorvastatin, or Lipitor, on reduction in hemorrhage rate in patients with CCM.
- Investigators at the Mario Negri Institute for Pharmacological Research in Italy are evaluating the efficacy of the approved beta blocker propranolol in reducing lesions and clinical events.

To our knowledge, the REC-994 program is the only industry-sponsored therapeutic program in clinical trials for CCM. If approved, REC-994 would be the first pharmacologic disease-modifying treatment for CCM, one of the largest areas of unmet need in the rare disease space.

Clostridium difficile Colitis

Summary

We have identified three lead NCEs (REC-163964, REC-164014 and REC-164067), with potential to be orally active, gut-biased, small molecule *C. difficile* toxin inhibitors, which we have shown to be inhibitors of glucosyl transferase. These molecules have the potential to prevent recurrent disease and be used as secondary prophylaxis therapy in high risk patients with *C. difficile* infections, a leading cause of antibiotic-induced diarrhea and a major cause of morbidity and mortality. We are currently completing exploratory, non-clinical, safety studies to enable selection of a development candidate.

Disease Overview

C. difficile induced diarrhea is a leading cause of antibiotic induced diarrhea and arises from the disruption of normal bacterial flora in the colon. Toxins A, or TcdA, and B, or TcdB, secreted by the bacterium are responsible for considerable morbidity, including severe diarrhea, colitis, toxic megacolon, sepsis, extended hospital stays, and, potentially, death. More than 730,000 patients are diagnosed in the US and EU5 each year. Recurrence of disease occurs in 20-30% of patients treated with standard of care.

Product Concept

We aim to discover and develop the first safe and efficacious, orally bioavailable, small molecule toxin inhibitor of *C. difficile*, which could be used to prevent recurrent infections and used prophylactically in high-risk patients, including elderly immunocompromised patients in long-term care facilities who have a history of related infections and hospitalizations. The molecules we are developing for this program were designed for gut-biased pharmacology to target the infection at its anatomic site in the GI tract while reducing systemic exposure and potential systemic effects. In addition, these molecules represent a novel mechanism that could be used in combination with currently approved and novel antimicrobials in development for this disease. Unlike antibiotic treatments that can eliminate the gut microbiota and further enhance *C. difficile* infection, this host-directed mechanism would not be expected to negatively impact the gut microbiome. Our drug candidate could have the potential to offer protection against recurrent *C. difficile* infections, thereby preventing significant morbidity and mortality.

Preclinical

We designed and produced three NCEs, including REC-163964, REC-164014, and REC-164067, discovered using our brute-force search approach leveraging human gut epithelial cells exposed to *C. difficile* Toxin B. The compounds are sub-structurally diverse and have properties which make them suitable for prophylactic therapy. All three molecules display nanomolar potency on our platform as well as in orthogonal functional validation assays including electric cell substrate impedance sensing, a measure of barrier integrity. We have shown in a target-based assay that all three molecules inhibit glucosyl transferase (IC50 = 1.2-10 nM), suggesting suppression of toxin-induced glycosylation of Rho-GTPases in host cells as the most likely mode of action. These molecules have negligible off-target activity, produce high gut/plasma ratios following oral dosing, low potential for drug-drug interaction, and are non-mutagenic. All three molecules improve survival in a hamster model of *C. difficile* infection.

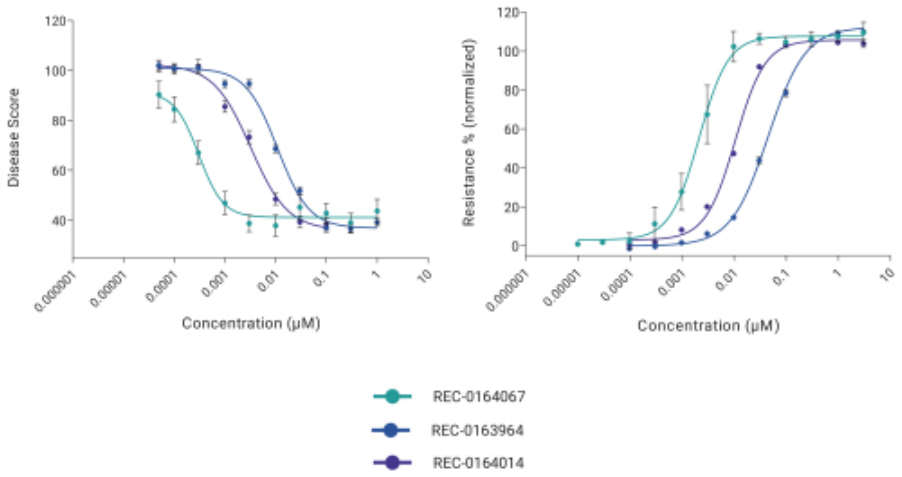


Figure 58. Lead compounds rescue Toxin B-induced phenotype and improve endothelial cell barrier integrity. Activity of lead compounds in the platform assay (left panel) and the ECIS assay (right panel). Left panel: A disease phenotype was induced by Toxin B, or TcdB, in HUVECs incubated with test compounds. Right panel: Transendothelial resistance was quantified with ECIS after incubation of HUVEC cells with 10ng/mL TcdB from *C. difficile* in the presence of test compounds. Data in both are presented as Mean ± SEM, N=>3 independent experiments.

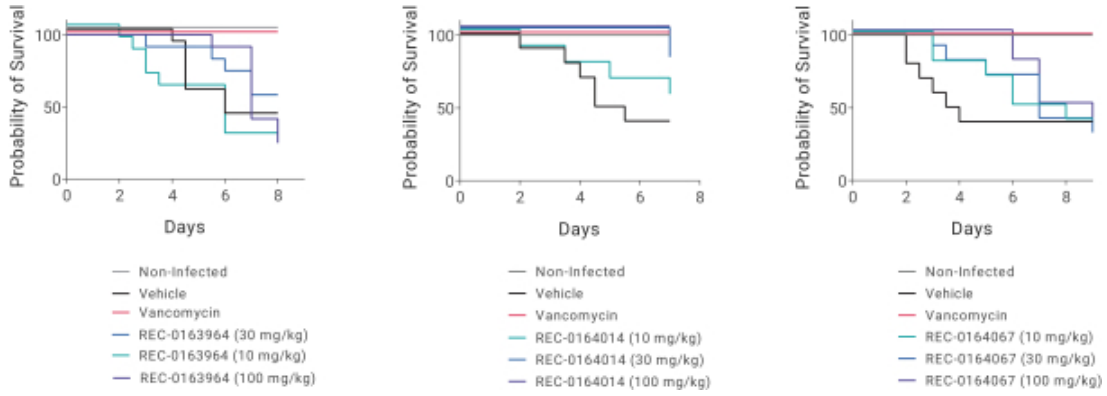


Figure 59. *C. difficile*-infected model hamsters treated with lead compounds survive longer than vehicle-treated animals. Test compounds were administered by oral gavage twice daily for 5 consecutive days along with groups for vehicle and vancomycin (50 mg/kg, QD). N=5 in untreated and vancomycin-treated animals and N=10 in vehicle and test-compound treated animals.

Clinical

The three lead candidates are being progressed into non-GLP, non-clinical safety studies. The molecule with the greatest safety margin will be advanced into IND-enabling safety studies.

Neuroinflammation

Early Discovery	Late Discovery	Preclinical	Phase 1	Phase 2	Phase 3

Summary

We have identified three lead NCEs (REC-648455, REC-648597, and REC-648677) with the potential to be first-in-disease, orally bioavailable, safe, CNS-penetrant, small molecule modulators of microglial activation. Microglial activation and neuroinflammation are hallmarks of neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease, and CNS inflammatory diseases such as Multiple Sclerosis. Small molecule modulators of microglial activation have the potential to reduce neuronal death associated with proinflammatory processes in neurodegenerative diseases and inflammatory diseases of the CNS. The project is in the lead-optimization phase.

Disease Overview

Neuroinflammation is a hallmark of numerous diseases of the central nervous system, including neurodegeneration. In the United States alone, more than six million people suffer from neurodegenerative diseases, with prevalence expected to grow as the population ages. Most neurodegenerative diseases lack safe and effective, disease-modifying therapies. Microglia are a cell type specific to the CNS that, when activated chronically, release proinflammatory cytokines such as TNFa, IL-6, IL-1ß, MCP-1, which drive neuronal toxicity and disease progression.

Product Concept

We aim to identify orally bioavailable and safe, CNS-penetrant, small molecule modulators of microglial activation which inhibit the activity and/or release of TNFa, IL-6 and other proinflammatory cytokines. By contrast to known anti-inflammatory molecules, which act through well-established pathways such as NF-kB and JAK and which have known associated immune-related liabilities, the molecules we have developed for this program act through novel NF-kB- and JAK-independent mechanisms. We believe there are therapeutic opportunities within neurodegenerative diseases, as well as peripheral immuno-inflammatory diseases such as inflammatory bowel diseases and dermatological diseases (atopic dermatitis and psoriasis).

Preclinical

All three molecules, REC-648455, REC-648597, and REC-648677, were discovered using our brute-force search approach leveraging human endothelial cells treated with TNFa. These molecules also inhibit TNFa stimulated IL-6 secretion in HUVEC cells and LPS evoked IBA1 expression in mouse microglial cells. REC-648455, REC-648597, and REC-648677 had IC50s of 95, 75, and 230 nM, respectively in HUVEC cells and IC50s of 80, 78, and 210 nM, respectively, in microglial cells. Using our proteomics platform, we showed that REC-648455 rescued a TNFa-evoked high-dimensional cytokine signature in HUVEC cells including inhibition of key cytokines implicated in neuroinflammation such as IL-1, CCL2 (MCP-1), CXCL5, and CCL5.

The mechanism of action of these molecules appears to be unique and independent of NF-kB and JAK since they do not inhibit TNFa-evoked NF-kB nuclear translocation and JAK activity. Our Recursion Map suggests that the high-dimensional phenotypic signature of these molecules cluster with a novel target that has not been tied to neuroinflammation in the literature and has not been explored clinically. All three molecules have properties consistent with favorable brain penetration and we are currently optimizing the metabolic stability and clearance properties of molecules in this series.

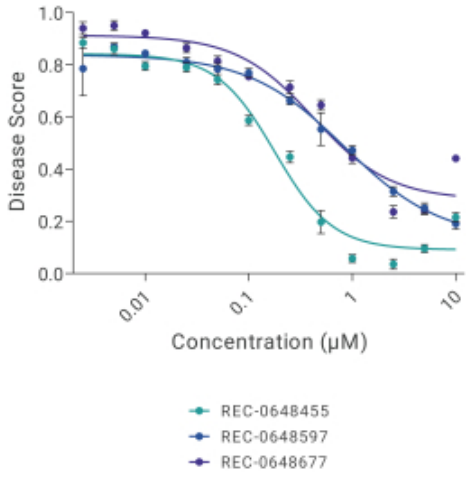


Table of Contents

Figure 60. Rescue of TNFa-evoked model by lead molecules. Three lead molecules rescued the effects of treatment of human cells with TNFa using our phenomics assay.

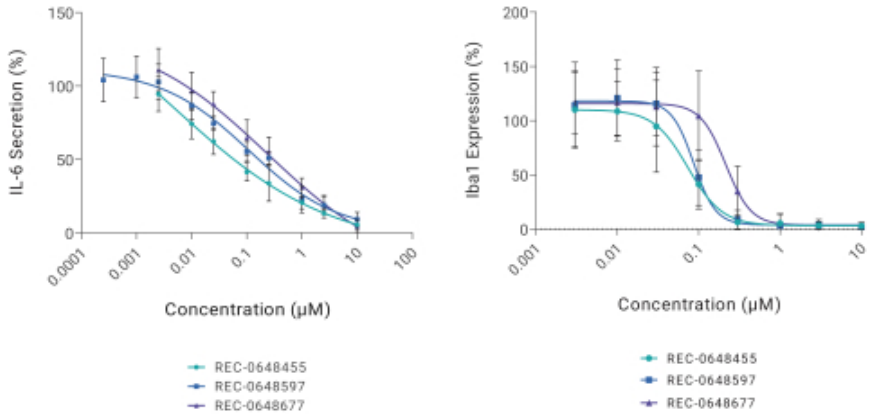


Figure 61. Lead molecules rescue TNFa-evoked functional effects in HUVECs and mouse primary microglial cells. Left panel: Following incubation of HUVEC cells with test compounds, TNFa (25 ng/mL) was added, plates were incubated and supernatant was collected and analyzed for IL-6 using homogeneous time-resolved fluorescence. Right panel: Following incubation of mouse microglial cells with test compounds, LPS (100 mg/ml) was added, plates were incubated, cells were stained for Iba1 and imaged using an IXM work cell. Data are presented as Mean ± SD, N=10 (HUVEC) and N=5 (microglia).

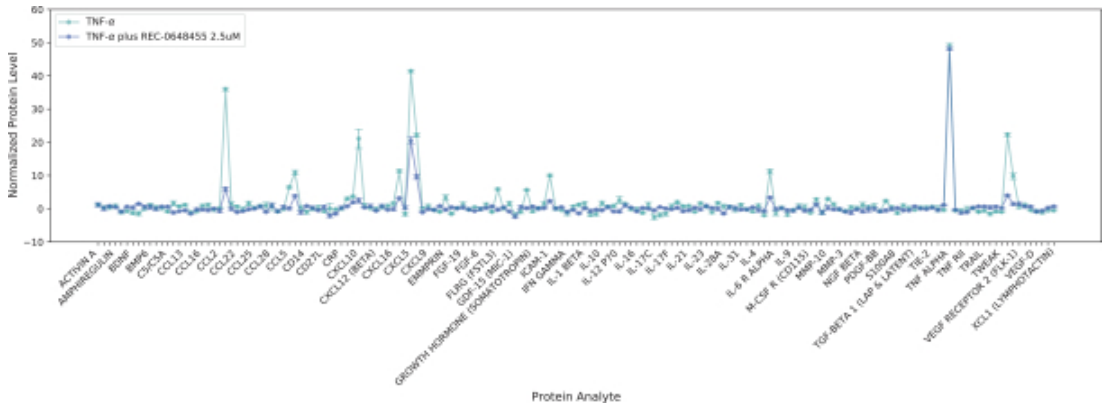


Figure 62. REC-648455 rescues a TNFa-evoked high-dimensional proteomics signature in HUVECs. HUVEC cells were pre-treated with compound, prior to stimulation with 1ng/mL of TNFa. Supernatants of treated samples were collected and processed by nPlex Biosciences, using miniaturized nELISA technology. Each condition was tested using 5 biological replicates.

Batten Disease

Early Discovery | Late Discovery | Preclinical | Phase 1 | Phase 2 | Phase 3

Summary

We have identified three lead NCEs, namely REC-648190, REC-259618, and REC-648647, with the potential to be orally bioavailable, CNS-penetrant, disease modifying therapeutics for multiple subtypes of Batten disease. Batten disease is an autosomal recessive, neurodegenerative disease resulting from mutations in one of fourteen *CLN* genes. While rare, these disorders collectively represent the most prevalent pediatric neurodegenerative disease and demonstrate significant unmet need. The project is currently in the lead-optimization phase.

Disease Overview

Batten disease, also called neuronal ceroid lipofuscinoses, is an autosomal recessive, neurodegenerative lysosomal storage disorder resulting from mutations in one of fourteen CLN genes. The US and EU5 prevalence of *CLN2* and *CLN3* forms of the disease is estimated to be roughly 2,000 patients. While rare, these disorders collectively represent the most prevalent pediatric neurodegenerative disease. The disease leads to cognitive, perceptual, and motor coordination impairment ultimately ending in premature death. The age of onset varies depending on the specific mutation, and death can range from early childhood to early adulthood.

Product Concept

We aim to discover and develop an orally bioavailable, CNS-penetrant, disease modifying therapeutics for multiple subtypes of Batten disease, including *CLN2*, *CLN3*, and *CLN8*. A CNS-penetrant, disease-modifying, small molecule therapeutic would have the potential to ameliorate both central and peripheral aspects of this neurodegenerative disease. The absence of known druggable targets and poor understanding of the underlying disease biology suggests a target agnostic approach for discovering new therapies may be useful.

Preclinical

We have identified three lead molecules, REC-648190, REC-259618, and REC-648647, from two chemical series using our brute-force search approach leveraging knock-down of the Batten disease gene *CLN8* in human endothelial cells. In addition, we have tested these molecules in a patient fibroblast functional assay in which we evaluated reduction of accumulation in ATP synthase subunit-c levels, a biomarker of lysosomal function, in *CLN2* Batten patient-derived fibroblasts. The project is in lead-optimization phase with the goal of improving potency, and oral and brain exposures.

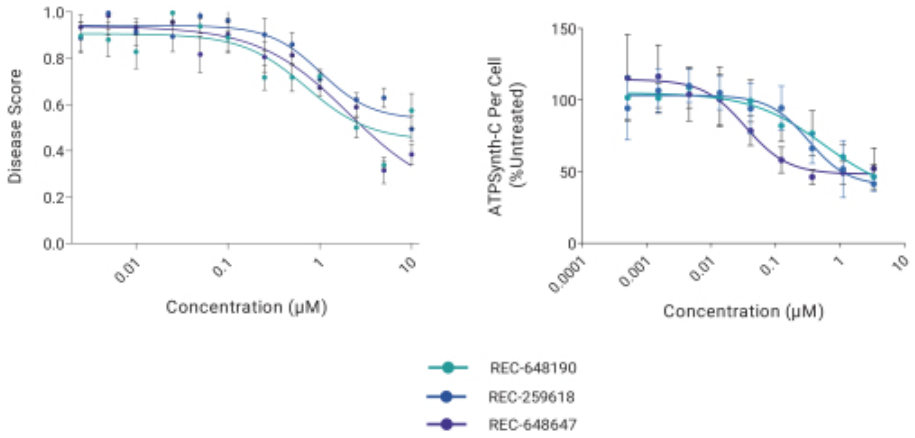


Figure 63. Multiple lead molecules rescue *CLN8* model and show activity in patient fibroblast secondary assay. Left panel: Three lead molecules rescued the effects of knockdown of *CLN8 in* human cells using our phenomics assay. Right panel: *CLN2* Batten patient fibroblasts were treated with test compounds and accumulation of ATP synthase subunit-c, a relevant marker of disease-associated lysosomal dysfunction, were measured. Data are presented as Mean ± SEM, n=2.

Charcot-Marie-Tooth Disease, Type 2A

Summary

We have identified multiple lead molecules, including REC-64810, REC-648458, REC-1262, and REC-150357, with the potential to be first-in-disease, orally bioavailable, disease modifying molecules to slow or reverse the progression of the mitochondrial disease CMT2A. CMT2A is a rare, autosomal dominant, peripheral nerve degenerative disease caused by mutations in the *MFN2* gene which leads to progressive muscle atrophy in the lower legs and hands. There are no approved disease modifying therapies for CMT2A. This project is currently in the lead-optimization phase.

Disease Overview

CMT2A is a rare, autosomal dominant, peripheral nerve disease caused by mutations in the MFN2 gene, which leads to progressive muscle atrophy in the lower legs and hands. CMT2A is the most common axonal neuropathic form of this disease and is estimated to affect approximately 15,000 patients in the United States and EU5. *MFN2* encodes the protein mitofusin-2 which plays a critical role in mitochondrial function and trafficking. Most patients develop symptoms in their early to late childhood and increasingly become more dependent on crutches or a wheelchair throughout their life.

Product Concept

We aim to discover and develop the first safe and efficacious, orally bioavailable small molecule disease-modifying therapy for CMT2A. The molecules we are developing for this program were designed to be peripheral nervous system-penetrant to achieve activity on the affected tissues. These molecules target a mechanism novel to this disease but with established clinical precedent that supports the target product profile for CMT2A.

Preclinical

We have identified four lead molecules, REC-64810, REC-648458, REC-1262, and REC-150357, from multiple chemical series using our brute-force search approach leveraging knock-down of the disease gene MFN2 in human retinal pigment epithelial cells. The most potent of these molecules, REC-64810, was characterized further and shown to rescue a key feature of CMT2A biology, mitochondrial fragmentation. REC-64810 has favorable blood-nerve-barrier penetration properties in rodents as evidenced by high drug exposure in sciatic nerve and dorsal root ganglion. Finally, REC-64810 increases ATP levels in iPSC-derived wild-type and patient neurons consistent with improvement in mitochondrial function. Our Recursion Map suggests that REC-64810 and the other three leads operate through a novel kinase mechanism which has previously not been implicated in this disease. This project is currently in the lead-optimization phase.

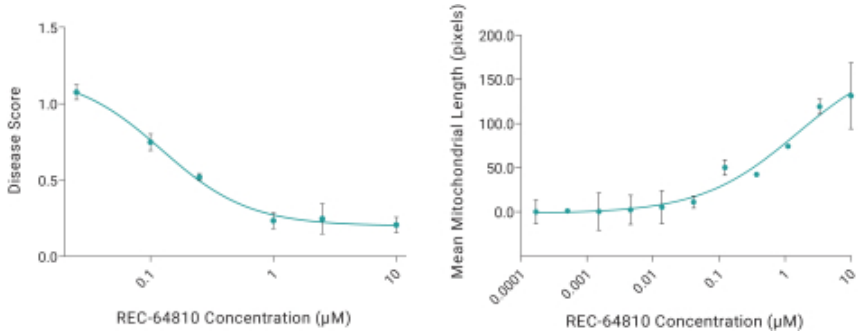


Figure 64. REC-64810 rescues MFN2 disease model and shows activity in secondary orthogonal assay. Left panel: REC-64810 rescued the effects of knockdown of *MFN2* in human retinal pigment epithelial cells. Right panel: REC-64810 also rescued a key measure of mitochondrial health, mitochondrial length.

Infusion rate	Plasma 6 h(nM)	Brain (nM)	SN (nM)	DRG (nM)
0.25mg/kg.h	13.9±3.0	59±14	430±165	1692±724
1mg/kg.h	112±72	262±53	1122±237	13141±2181

Table 7. REC-64810 achieves high exposures in peripheral nerves. Rats were dosed with REC-64810 at two infusion rates to obtain steady-state levels. Exposure levels were determined after 6 hours in the indicated tissues.

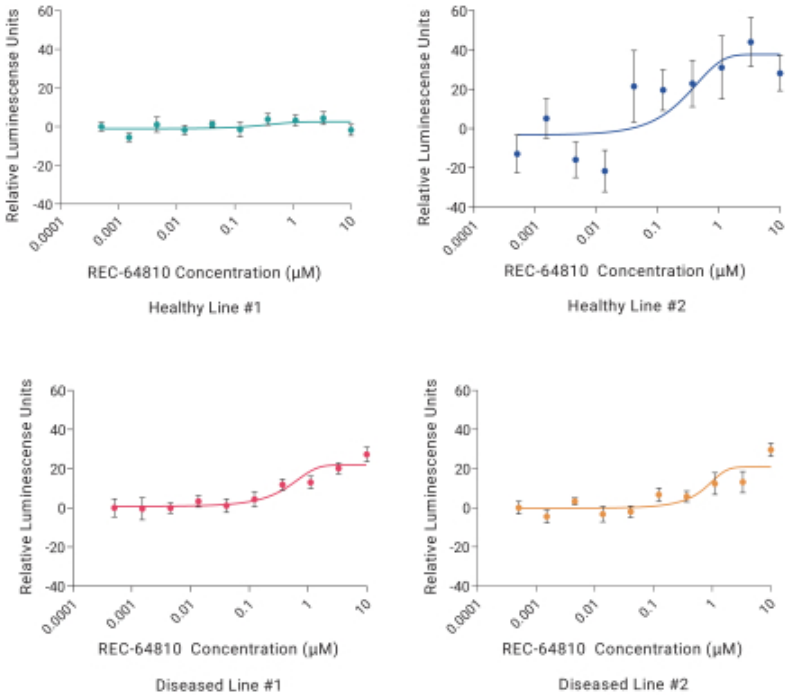


Figure 65. REC-64810 increases ATP production in iPSC neurons from both healthy subjects and CMT2A patients. Healthy (top panels) and CMT2A (bottom panels) patient iPSC-derived motor neuron samples were cultured for 5 days and then treated with REC-64810. A key measure of mitochondrial function, ATP levels, were measured. Data represents the mean of two independent experiments and is presented as % Relative Luminescence Units ± SEM.

Immune Checkpoint Resistance in STK11 mutant NSCLC

Summary

We have identified a novel use for a clinical-stage, orally bioavailable small molecule to restore and improve sensitivity to immune checkpoint inhibitors in tumors harboring mutations in the tumor suppressor gene *STK11*. There are approximately 30,000 cases of *STK11* mutant metastatic NSCLC per year in the US and EU5, and these mutations have been shown to predict poor prognosis and resistance to ICI, specifically anti-PD(L)-1 therapies. There are currently no approved therapies developed to specifically modulate tumor response in *STK11* mutant cancers. This program is currently in the dose-optimization phase.

Disease Overview

STK11 is a tumor suppressor gene that is involved in a variety of cellular processes including cell metabolism, apoptosis, cell polarity, and DNA damage response. Mutations in *STK11* are becoming widely recognized as a driver of resistance to immune checkpoint blockade, specifically in patients with NSCLC. Up to 30% of all NSCLC cases and approximately 14% of metastatic NSCLC cases harbor mutations in the *STK11* gene, and *STK11* deficiency is associated with reduced density of infiltrating cytotoxic CD8+ T lymphocytes leading to poor prognosis and unfavorable outcomes in patients receiving anti-PD(L)-1 therapy. Only 7% of NSCLC patients are estimated to derive benefit from checkpoint inhibitors and there are no FDA approved treatments targeting patients with *STK11* mutations in metastatic NSCLC.

Product Concept

We aim to discover and develop a new generation of orally bioavailable, small molecule therapeutics that reverse the biology of *STK11* deficiency and resensitize tumors to combination treatment with anti-PD(L)1 therapy. *STK11* mutations attenuate tumor responses to anti-PD(L)-1. We intend to position these therapeutics in combination with anti-PD-(L)1 and other targeted therapies in both the checkpoint refractory and naive metastatic NSCLC populations.

Preclinical

The novel use of REC-64151 for *STK11* mutant NSCLC was discovered using our inferential-search approach. Based on inferences made by the Recursion Map, we initiated animal studies to evaluate the combination of REC-64151 with anti-PD-1 in a built-for-purpose CT26 *STK11* tumor model. The compound demonstrated a statistically-significant reversal of immune checkpoint resistance. Ongoing pharmacologic studies will enable dose optimization and collect additional flow cytometry data to establish mechanism of action. REC-64151 is a known chemical entity with clinical precedent and, if dose-optimization studies in the rodent support efficacy at exposures achievable in humans, the molecule may be well-positioned to advance into Phase 1 studies.

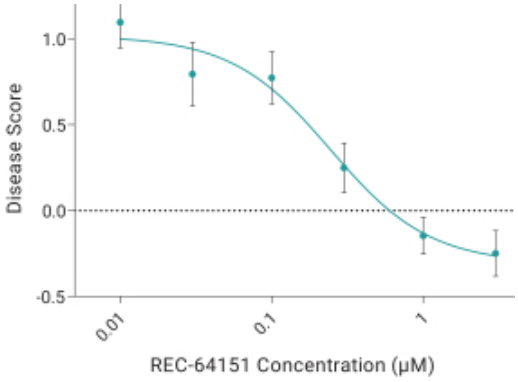


Figure 66. REC-64151 rescue of STK11 disease model. REC-64151 produces potent rescue of the high-dimensional platform *STK11* KO phenotype in HUVEC from a disease state back to a healthy cellular state with an EC50 of 244nM.

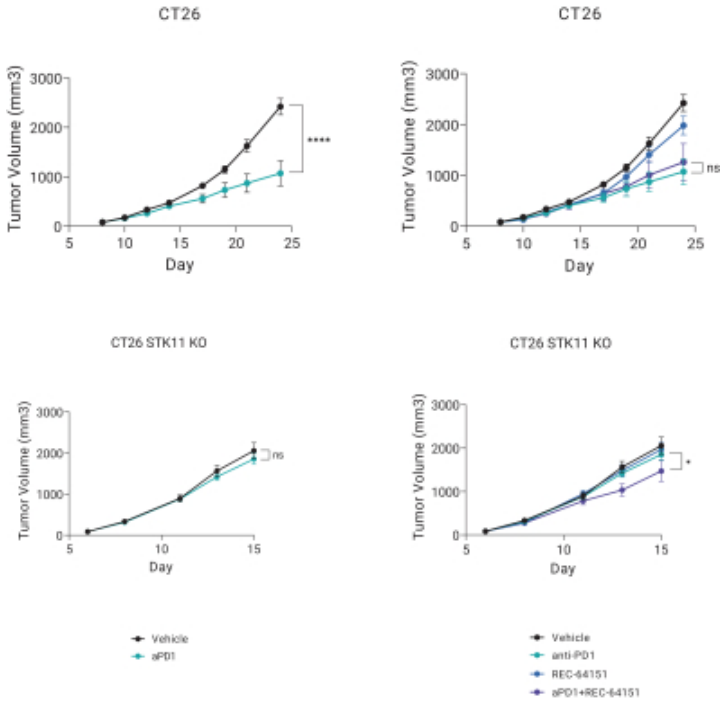


Figure 67. REC-64151 reverses immune checkpoint resistance in STK11-deficient CT26 tumors. CT26 parental and CT26 STK11 KO cells were injected into the subcutaneous flank of mice, allowed to size match, and mice were treated for 15d (CT26 *STK11* KO) or 21d (CT26) with either vehicle (black), anti-PD1 (10 mg/kg/day BIW), REC-0064151 (100 mg/kg/day QD), or anti-PD1 + REC-64151 (at same doses for each compound). Tumor volumes are represented as mean ± SEM.

Small molecule Myc inhibitors

Early Discovery | Late Discovery | Preclinical | Phase 1 | Phase 2 | Phase 3

Summary

We have identified multiple hit series using our inferential-search approach that have subsequently shown concentration-dependent activity in suppressing transcriptional activity downstream of MYC. Increased expression of MYC transcriptional target genes present across oncology and up to 50% of cancers harbor alterations in MYC. Novel small molecules with the potential to suppress MYC-dependent activity could improve treatment of diverse tumors and especially those harboring mutations in genes directly implicated in MYC activation. There are currently no approved molecules that target MYC specifically. This program is currently in the hit-to-lead phase.

Disease Overview

Gain-of-function alterations in *MYC* have been identified in more than 50% of human cancers[10], but efforts to pharmacologically inhibit this protein have been hampered by a protein structure lacking in traditional compound binding pockets. In addition, MYC pathway activation is observed in tumors harboring alterations in oncogenes and tumor suppressors of related pathways, such as WNT-Beta-catenin. Small molecules specifically efficacious in the context of tumors with gain-of-function *Myc* biology could be broadly efficacious across multiple solid tumors and hematological malignancies.

Product Concept

We aim to discover and develop novel, orally bioavailable small molecules that inhibit *MYC* activity for treatment of diverse cancers characterized by aberrant activation of the MYC pathway. Using inferential-search approaches, we have identified multiple distinct structural and mechanistic classes from our chemical library involved in MYC activity or protein stability and have expanded these hits to generate multiple unique hit series.

Preclinical

We have identified several hit molecules, including REC-841, REC-136302, REC-163196, REC-120464, REC-145834, and REC-162977, from multiple chemical series using our inferential-search approach to predict molecules with the potential to inhibit the activation of MYC. Molecules targeting HSP90, which is known to modulate MYC transcriptional activity, were recovered as positive controls. In addition, REC-841, a known molecule implicated in the ubiquitin proteasome system was recovered as a potential starting point to design MYC-specific degrader molecules. Other hit molecules are predicted to operate via novel mechanisms. These predicted hits were validated in a cell-based luciferase MYC reporter assay. Hit series are currently being expanded using our digital chemistry tools.

10 Chen, H., Liu, H. & Qing, G. Targeting oncogenic Myc as a strategy for cancer treatment. Sig Transduct Target Ther 3, 5 (2018). https://doi.org/10.1038/s41392-018-0008-7

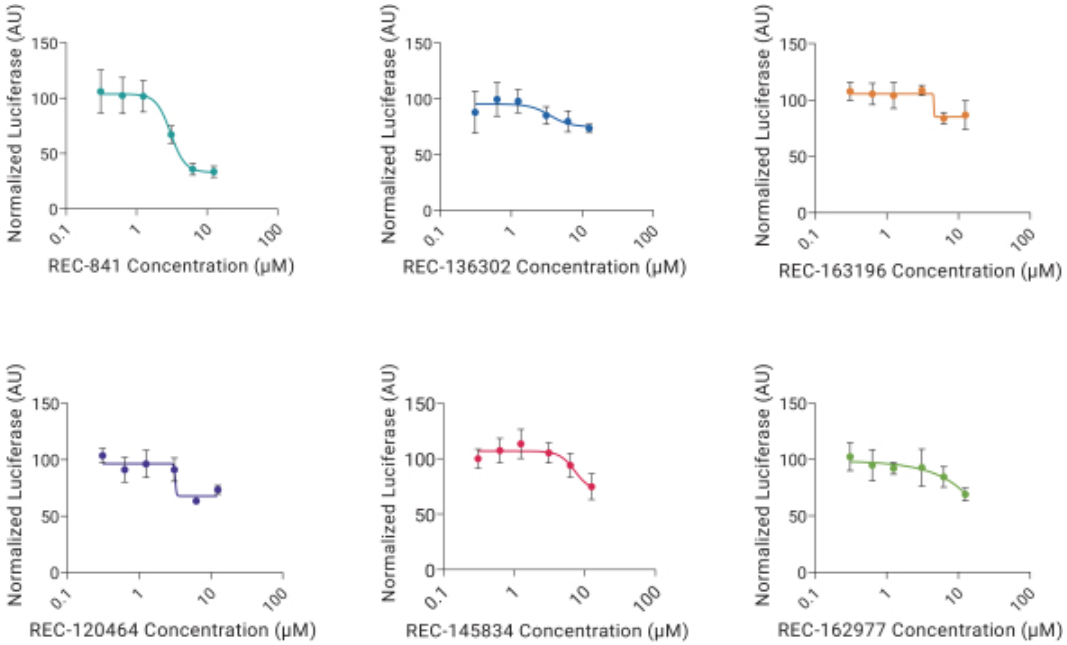


Figure 68. Inferred hits from our platform validate in orthogonal MYC transcriptional reporter assay. Inference-based hit selection recovers known and novel molecules implicated in MYC activity based on comparison of Phenotype similarity to *MYC* CRISPR knockout phenotypes. Phenomics profiles of novel molecules and known molecules cluster distinctly, though all show similarity to *MYC* knockout (Left). Phenomics-inferred MYC hits demonstrate concentration-dependent suppression of Myc transcriptional activity in an orthogonal Myc luciferase assay

Additional Programs

In addition to the Notable Programs highlighted above, we have 25 additional programs, which we believe will drive future opportunities for us. Fourteen of these programs, identified using our inferential search approach, were discovered and validated since July 2020. Moving forward, we expect that the vast majority of new additions to our pipeline will be discovered using our inferential approach.

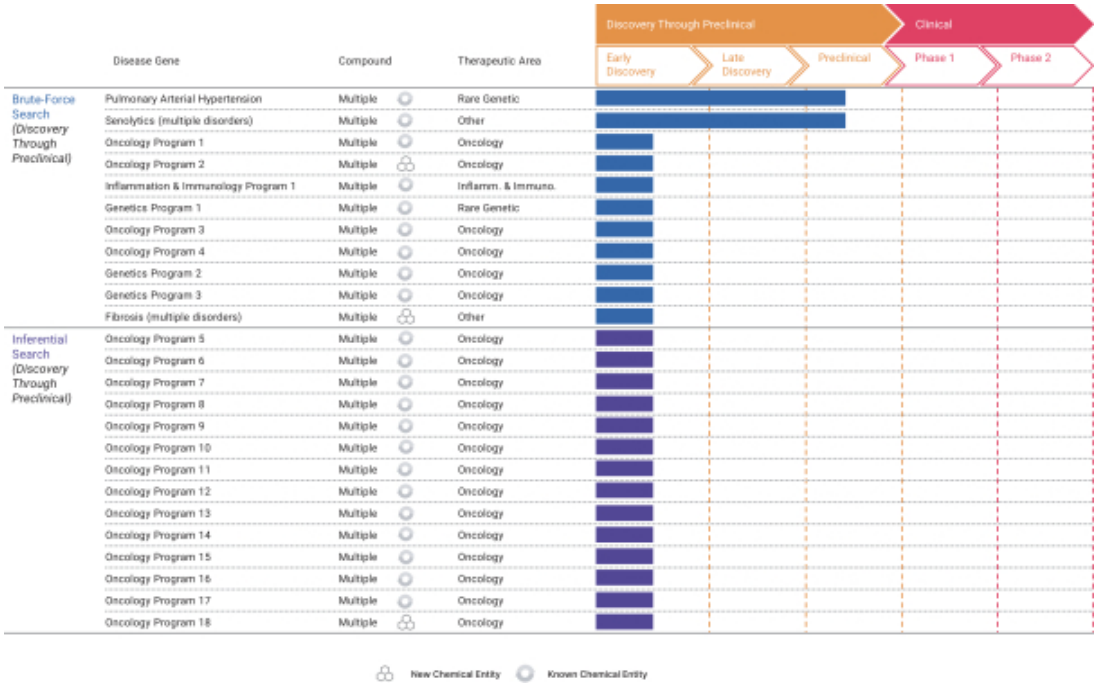


Figure 69. Our large and diverse set of additional research programs. Additional programs in active development cover a number of therapeutic areas, from cancer to inflammation to rare genetic disorders. All of these programs were discovered and developed using our Recursion OS.

Pulmonary Arterial Hypertension

Summary

We have identified a novel use for REC-1886, a known chemical entity with clinical precedent, as a potential first-in-disease, oral disease-modifying therapeutic for the treatment of pulmonary arterial hypertension, or PAH. PAH is a progressive disease that is characterized by high pressure in the pulmonary artery associated with high mortality and morbidity. This project has the potential to lead to an in-licensed clinical stage candidate or trigger an NCE project based on our understanding of REC-1886.

Disease Overview

PAH is characterized by abnormally high vascular resistance and blood pressure in the pulmonary artery resulting from increased vascular smooth muscle cell proliferation, hypertrophy, and fibrosis leading to heart failure, and death. There are approximately 35,000 patients with PAH in the US and EU. PAH can be sporadic (idiopathic) or inherited (familial). Eighty percent of familial PAH is caused by mutations in the *BMPR2* gene. Disease onset is variable, but is typically observed between 30 and 40 years of age. Early symptoms include shortness of breath and fatigue. Without treatment the median survival is 2.8 years.

Product Concept

We aim to discover and develop a safe, orally bioavailable, small molecule, disease-modifying therapy that can reverse the underlying biology of PAH and improve survival. PAH is managed by multiple approved vasodilators which provide symptomatic benefit but do not modify the underlying course of disease. A novel disease modifying therapy that can improve survival in patients with PAH, would represent a major therapeutic benefit for these patients.

Preclinical

We have identified REC-1886, an orally bioavailable, known chemical entity with clinical precedent, using our brute-force search approach and leveraging CRISPR knockout of the PAH gene BMPR2 in human endothelial cells. In addition, REC-1886 rescued cytokine-evoked endothelial to mesenchymal transition in primary human pulmonary arterial endothelial cells, which is a key biological driver of both pulmonary vascular smooth muscle proliferation and vascular remodeling in PAH.

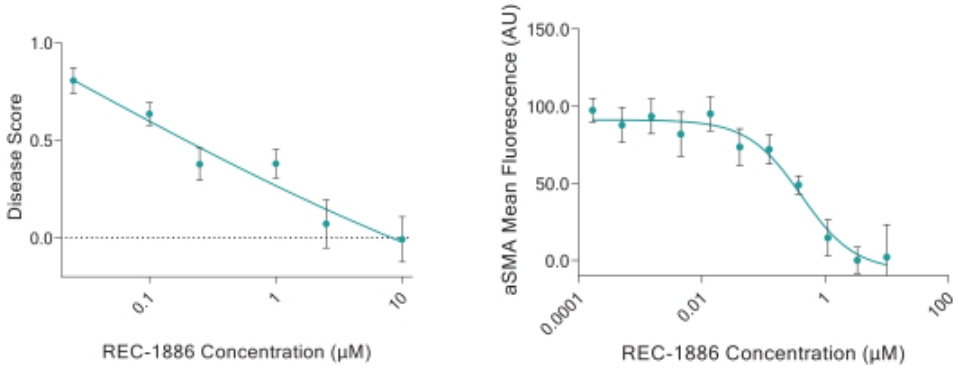


Figure 70. REC-1886 rescues phenotype in the platform and secondary functional assay. Left panel: REC-1886 rescues the CRISPR-mediated gene knockout of *BMPR2* in HUVEC on our phenomics platform. Right panel: Human pulmonary arterial endothelial cells were treated with a cytokine cocktail to induce a relevant fibrotic disease state and expression of αSMA, a key smooth muscle marker of fibrosis, was quantified by immunofluorescence. Data is presented as Mean ± SEM, n = 3.

We have also evaluated REC-1886 in a monocrotaline rat model of PAH. In this study, REC-1886 at 15 mg/kg, BID, po normalized right ventricular systolic pressure and right ventricular weights consistent with improvement in pulmonary vascular disease. Macitentan, an endothelin receptor antagonist approved for PAH, modestly reduced right ventricular systolic pressure but had no effect on right ventricular weights.

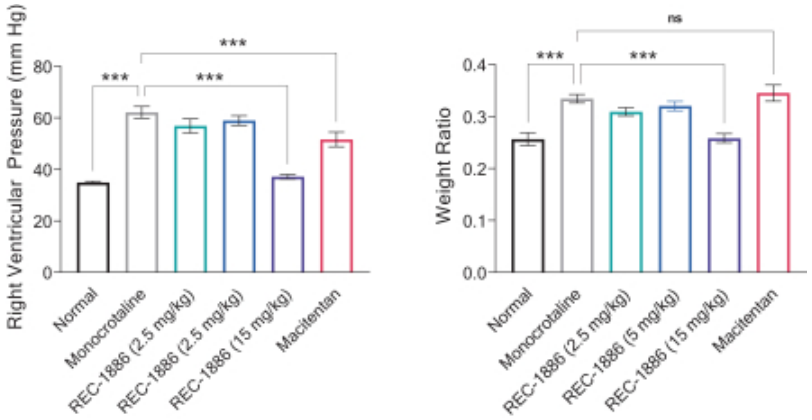


Figure 71. REC-1886 is efficacious in the rat monocrotaline model of PAH. Left panel: right ventricular systolic pressure. Right panel: The ratio of right ventricular weight to the sum of left ventricular plus interventricular septum weights RV/(LS+IVS). PAH was modeled in male Sprague-Dawley rats by injecting monocrotaline 60 mg/kg SC. Animals were dosed with vehicle, REC-1886 or macitentan (30 mg/kg, QD) for 28 days. At the end of the dosing phase, rats were placed under anesthesia for hemodynamic assessment following which lung tissues were harvested for histology measurements. Data is presented as Mean ± SEM, n = 10 per group.*** p<0.001 vs Monocrotaline.

Senolytics—Systemic sclerosis

Early Discovery | Late Discovery | **Preclinical** | Phase 1 | Phase 2 | Phase 3

Summary

We have identified REC-4249 using our brute-force approach as a lead molecule for a first-in-disease, oral active senolytic to treat a range of senescent diseases. Senescence biology has been implicated in many age-related and chronic diseases. If successful, this project has the potential to lead to an in-licensed clinical stage candidate.

Disease Overview

Senescence is the process by which cells irreversibly stop dividing and enter a state of permanent growth arrest without undergoing cell death. The accumulation of senescent cells that chronically secrete pro-fibrotic/inflammatory cues in tissues is associated with many age-related and chronic diseases including systemic sclerosis and osteoarthritis. Diseases implicating cellular senescence such as pulmonary fibrosis, pulmonary hypertension, cardiac dysfunction, kidney failure carry high mortality rates. The pharmacological elimination of these pathogenic cells has the potential to slow or reverse disease progression and has been shown to increase lifespan in rodent models.

Product Concept

We aim to discover and develop a safe, orally bioavailable, small molecule senolytic to treat diseases involving cellular senescence. Senolytic therapies have the potential to be active in multiple indications involving cellular senescence. Initial preclinical models will be focused on the disabling connective tissue disease scleroderma, but molecules from this program may be active in additional indications as well. Current therapies for diseases involving cellular senescence are directed at symptomatic relief and do not alter disease progression.

Preclinical

We have identified an orally bioavailable, known molecule with clinical precedent, REC-4249, using our brute-force search approach leveraging a model of endothelial senescence. REC-4249 was selected as a lead based on activity in both a cell-based high-dimensional phenomics assay and differential viability in a healthy vs senescent endothelial cell assay. REC-4249 significantly reduced levels of the senescent biomarker (p16) in liver tissues of aged mice. In addition, similar but not statistically significant trends were detected in kidney and lung tissues. The *in vivo* efficacy and safety of REC-4249 is being evaluated in a preclinical rodent scleroderma model.

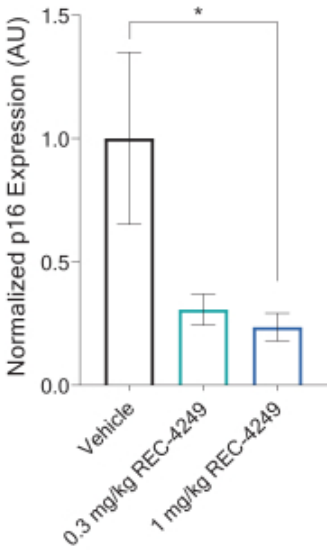


Figure 72. REC-4249 reduces the expression of a senescence marker in aged mice. Aged mice (23+ months) were treated with vehicle (black), 0.3 mg/kg/day REC-4249 (cyan) or 1.0 mg/kg/day REC-4249 (blue) for four days. P16 RNA expression levels were determined by RT-qPCR, normalized to 18s expression levels. Data is presented as mean ± SEM, n=8 per group. *p<0.01 vs Vehicle-treated group.

Our Strategy for Value Creation

Our Recursion OS has produced one of the largest and most diverse therapeutic pipelines within the healthcare industry for a company of our size and maturity. In addition to pipeline breadth, we are committed to advancing these programs from early discovery through clinical development and ultimately to patients as efficiently as possible. However, creating a deep and mature therapeutic pipeline is capital and personnel intensive. Therefore, we have deployed resources internally and externally to create a multi-pronged, capital efficient value creation strategy which will help facilitate greater integration as the company matures through time.

In the near and medium-term, we expect to continue to build and advance an internal pipeline of programs into the clinic which is primarily focused on genetically-driven diseases (including rare diseases and genetically-defined oncology) and other areas of niche unmet need. A number of benefits are afforded to us by working in these areas, including special incentives granted by regulatory agencies that often shortens the time it takes to get a therapeutic to patients, therapeutics often commanding significant economics, possible market exclusivity for a period of time, tax credits on research and development costs, and clinical trials that may be prosecuted at a relatively low cost compared to larger indications.

Prosecuting large disease indications from early discovery through clinical trials and commercialization may be cost prohibitive for us to pursue completely independently at this stage of our company's growth and would risk distracting us from our longer-term value-creation strategy. Therefore, in the near and medium term, we expect to pursue partnerships with large pharmaceutical or biotechnology companies in these larger disease indications such as inflammation, neurodegeneration, senescence, large oncology indications, immuno-oncology, and infectious disease.

Our multi-pronged, capital-efficient value creation strategy is meant to advance business opportunities in the near and medium term and build towards the company's long-term vision and viability. By leading clinical prosecution of its internal therapeutic pipeline, we hone our execution expertise across a range of indications and regulatory protocols. By delivering against the objectives of our enterprise-scale partnerships, we not only garner operational excellence but gain experience with large intractable diseases and novel therapeutic modalities. By reinvesting proceeds from our enterprise-scale partnerships, we will further advance programs in our pipeline and continue to expand its breadth and depth. Moreover, we will build out greater technological and biological capabilities to drive integration and operating synergies. Over the medium-term, we will refine our business opportunities including internal development, subsidiary formation, partnerships and out-licensing.

The near to medium-term elements of our business strategy align with our three key value drivers. We intend to:

Develop the Current Pipeline of Assets While Delivering Super-Linear Pipeline Growth.

- Rapidly advance our Notable Products through development and potential regulatory submission.
- Super-linearly expand and advance our pipeline.
- Mitigate portfolio risk through therapeutic and mechanistic diversification and select asset partnerships.
- Demonstrate that our time and costs at each stage of discovery and development are lower than industry averages.
- Demonstrate that the level of technical success for our clinical programs is greater than industry average.
- Continue growing the Recursion Data Universe and improve the Recursion Map as we believe that the assets that will drive the most value for Recursion and society are those still to come.

Execute on Strategic Partnerships to Maximize the Potential Value of Our Platform.

- Execute partnerships with industry-leading companies addressing broad therapeutic aresas or additional therapeutic modalities, such as large molecules or RNA therapeutics, where we can leverage our tools and our partners' expertise and resources to advance programs rapidly.
- Deliver on our strategic partnership with Bayer in the field of fibrosis.

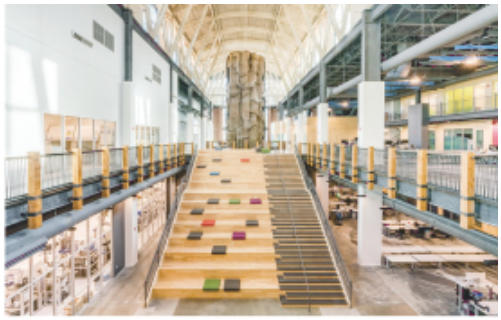
Explore New Extensions and Business Opportunities Arising from the Recursion Map Through Induction Labs.

- Maximize the value of existing and planned investments in infrastructure, tools, and people by exploring tangential business verticals (e.g., additional therapeutic modalities, diagnostics, finance, agriculture, veterinary medicine).

If we are successful in our pursuit to industrialize drug discovery, we may have the opportunity to pioneer how and where value is allocated within the biopharmaceutical industry by i) commanding more value while partnering programs much earlier in the discovery and development process, ii) addressing disease areas of high unmet need that are otherwise considered too small or unprofitable for traditional drug development, and iii) competing on innovation and speed-to-market in major therapeutic areas, commanding a leadership position. We believe that success in these endeavors may lead to a lasting, positive, and transformative impact on patients' lives and the biopharmaceutical industry.

Facilities

Headquarters. In 2018, we moved to our current headquarters which is located in downtown Salt Lake City, Utah. We lease 105,419 square feet of office, research, and laboratory space under a lease that expires in May 2028 and have entered into a lease for an additional 91,748 square feet of office, research and laboratory space that expires the earlier of 10 years after we take occupancy or March 2032. Our modern headquarters is a draw for local, national and international talent and houses both traditional and automated laboratories for drug research.





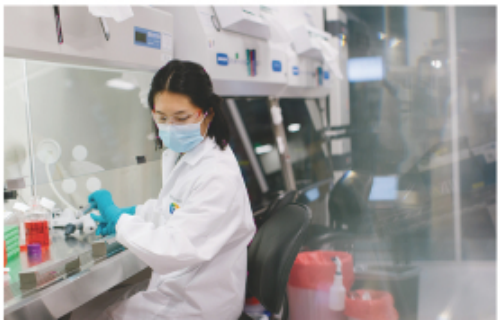




Figure 75. **Our headquarters is centrally located in downtown Salt Lake City, Utah.** Images of our headquarters in Salt Lake City, Utah. We are a proud founding member of BioHive, the branding effort of the life science hub of Utah. Working with state and local government, we are helping to create a burgeoning move for local life science companies to a downtown cluster centered around our headquarters.

Research Vivarium. We also lease a 24,974 square foot property that serves as a rodent vivarium in Milpitas, California under a lease that expires in May 2028. We use this facility to conduct drug-discovery enabling pharmacokinetic, pharmacodynamic and exploratory safety studies. The facility is equipped with proprietary, digitally-enabled cage technology we are developing.

Figure 76. Our advanced vivarium for performing *in vivo* studies.

Corporate Social Responsibility

We derive our philosophy around corporate social responsibility from our mission: *Decoding Biology to Radically Improve Lives*. We take a generous position with regards to "radically improving lives", considering the lives of patients and those who love them (impacted by our innovations), the lives of our employees and their families (impacted by our benefits, culture, opportunities to learn and grow and fair compensation), and importantly the lives of those in communities where we work, because a strong foundation helps us build for the long-term. From a community perspective, we focus on areas of impact that are aligned with our values and our strengths and this guides our philosophy for corporate social responsibility. Given that, we actively participate in, or sponsor, key community efforts within the following focus areas:

- Diversity, equity and inclusion in technology and biotechnology (e.g., we hosted a popular quarterly local Women-in-Science-and-Tech speaker series and sponsored the Silicon Slopes' conference's first Diversity & Inclusion track).

- The growth and sustainability of our local life science and technology ecosystems (e.g., we were a founding sponsor and member of BioHive, the branding effort around the life science industry in Utah, and re-purposed our prior headquarters to launch Altitude Labs, a biotech incubator/accelerator with an emphasis on supporting underrepresented founders).
- The promotion of sustainable environmental practices (e.g., we chose our current headquarters to maximize public transit utilization and received an award for being one of the most 'bike-friendly' startups in the country).

Recursion Foundation

The Recursion Foundation was established in 2019 as a vehicle through which we could drive our charitable and philanthropic efforts over time. In late 2020, our Board of Directors committed to putting 1% of our equity into the Recursion Foundation to help demonstrate the strong commitment we have to social responsibility and to ensure a sustainable future for our work in this arena.

Altitude Lab

Altitude Lab was the first effort of the Recursion Foundation. In partnership with the University of Utah, Altitude Lab was formed as a mixed incubator/accelerator model with a focus on creating a new generation of biotechnology founders in Utah including a special emphasis on underrepresented founders. Altitude Lab commenced operations in the fall of 2020 and has already received applications from dozens of local, national and international startups, and admitted six of these startups. We seek to help these companies with early growth and fundraising while offering them access to laboratories and equipment that would otherwise be prohibitively expensive. Our goal is for these startups to grow permanently in Utah, in order to create a more sustainable life science ecosystem. Altitude Lab's early occupants include Y Combinator startup Known Medicines, 3Helix, NexEos Bio, Teiko, whose founder and CEO is the former CEO of Counsyl) and more.

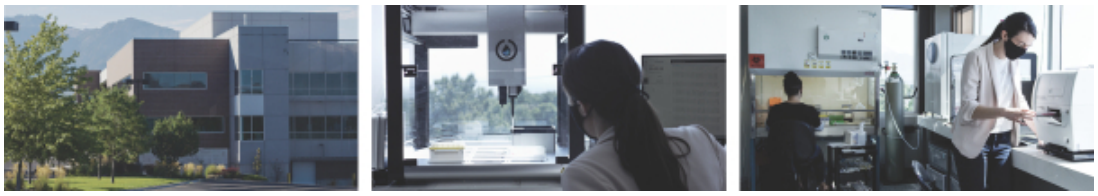


Figure 77. **The Altitude Lab incubator is already fostering the next generation of innovative life sciences companies in Utah.** We and the University of Utah jointly founded Altitude Lab in our former headquarters at the University of Utah Research Park to help contribute to the generation of a sustainable ecosystem of life science companies in Utah, with an emphasis on underrepresented founders.

Commercialization

We intend to retain significant development and commercial rights to some of our drug candidates and, if marketing approval is obtained, we may commercialize our drug candidates on our own, or potentially with a partner, in the United States and other geographies. We currently have no sales, marketing, or commercial product distribution capabilities. We may build the necessary infrastructure and capabilities over time for the United States, and potentially other regions, though like all things we do, we would seek to leverage technology to build these capabilities over time to be significantly more efficient than the industry average. Decisions to create this infrastructure and capability will be made following further advancement of our drug candidates and based on our

assessment of our ability to build said capabilities and infrastructure with competitive advantage. Clinical data, the size of the addressable patient population, the size of the commercial infrastructure, manufacturing needs, and major trends as to how value is accrued in the industry may all influence or alter our commercialization plans.

Manufacturing

We utilize and expect to continue to utilize contract development and manufacturing organizations to produce drug substance and drug product in support of the assets within our pipeline. To date, we have obtained drug substance and drug product for our drug candidates from third party contract manufacturers. We are in the process of developing our supply chain for each of our drug candidates on a project-by-project basis based on our development needs.

As we grow, we will continue to re-evaluate production capabilities and may establish in-house manufacturing. As a first step toward in-house manufacturing, the Company is in the process of securing a facility in Salt Lake City, Utah to establish production capabilities for preclinical animal studies and early human clinical trials.

Intellectual Property

Our intellectual property focus is the industrialization of phenomics, a new class of -omics data, and have applied industry knowledge to date to continue to build out and expand a variety of other leading edge technologies. Further, we have generated algorithmic, software, and statistical insights in the course of our work. Within the burgeoning field of technology-enabled drug discovery, we seek to protect our innovations, with a combination of patents and trade secrets and for each novel technology or improvement we develop, we consider the appropriate course of intellectual property protection.

Our commercial success depends in part on our ability to obtain and maintain proprietary protection for drug candidates and any of our future drug candidates, novel discoveries, product development technologies and know how; to operate without infringing, misappropriating or otherwise violating the proprietary rights of others; and to prevent others from infringing, misappropriating or otherwise violating our proprietary rights. Our policy is to seek to protect our proprietary position by, among other methods, filing or in-licensing U.S. and foreign patents and patent applications related to our proprietary technology, inventions and improvements that are important to the development and implementation of our business. We also rely on trademarks, trade secrets, know-how, continuing technological innovation and potential in licensing opportunities to develop and maintain our proprietary position.

We believe in the benefits of open-source science and that open-source data sharing drives value for us and society as a whole. For example, we have published certain key findings derived from our platform around COVID-19 under terms designed to allow anyone to make use of the data and in the hope that the data would be useful in fighting the global pandemic. We have also released some of the largest open-sourced biological datasets in the world, the RXRX series, under terms that allow for broad academic and non-commercial use.

Patents

As of January 2021, we own 42 issued U.S. patents, 34 pending U.S. patent applications, 24 pending U.S. provisional patent applications, 2 pending foreign patent applications, 6 pending international applications and we exclusively license 9 issued U.S. patents, 2 pending U.S. patents

applications, 117 issued foreign patents and 19 pending foreign patent applications. These patents fall into 95 different patent families across 79 different jurisdictions worldwide.

- *Recursion OS IP*: Our Recursion OS is covered by several patent owned families, comprising 3 U.S. patents, 4 pending U.S. provisional applications, 9 pending U.S. non-provisional applications, five pending PCT applications and 2 pending foreign patent applications. We also pursue a strategy of seeking patent protection on smaller discrete inventions throughout the breadth of our pipeline, ranging from experiment design, operations within our labs, data collection, and analysis (including deep learning insights); Our patents related to our Recursion Learning Platform System IP generally expire between 2038 and 2041, excluding any patent term adjustment or patent term extension.
- *InVivomics*: Additionally, through our acquisition of Vium, we obtained a collection of active patent families related to InVivomics, including 39 issued patents covering cage design, data collection, and data analysis, 24 pending U.S. non-provisional patent applications and 1 pending U.S. design application. Our patents related to our InVivomics generally expire between 2035 and 2040, excluding any patent term adjustment or patent term extension.
- *Compound IP*: Our Compound IP portfolio comprises 167 owned and exclusively licensed patents and applications of which we own 20 U.S. provisional patent applications, 1 pending international application and we exclusively license 1 U.S. provisional patent application, 9 U.S. patents, 1 pending U.S. patent application, 20 pending foreign patent applications and 116 foreign patents. A further breakdown of our Compound IP portfolio is below:
  - REC-2282: We exclusively license 3 issued U.S. patents, 1 pending U.S. patent application, 38 issued foreign patents, and 3 pending foreign patent applications related to REC-2282 from OSIF. Our licensed patents related to REC-2282 generally expire between 2027 and 2036, excluding any patent term adjustment or patent term extension.
  - REC-3599: We own 3 U.S. provisional patent applications in connection with our REC-3599 product candidate.
  - REC-994: We exclusively license 2 U.S. patents, 2 issued foreign patents and 9 pending foreign patent applications in connection with our REC-994 product candidate from UURF. Our licensed patents related to REC-2282 generally expire between 2035 and 2036, excluding any patent term adjustment or patent term extension.
  - REC-4881: We exclusively license 3 U.S. patents, 69 foreign patents and 5 pending foreign patent applications in connection with our REC-4881 product candidate from Takeda. Our licensed patents related to REC-4881 generally expire between 2027 and 2032, excluding any patent term adjustment or patent term extension.

The patent positions of companies like ours are generally uncertain and involve complex legal and factual questions. No consistent policy regarding the scope of claims allowable in patents in the field of biotechnology has emerged in the United States and in Europe, among other countries. Changes in the patent laws and rules, either by legislation, judicial decisions, or regulatory interpretation in other countries may diminish our ability to protect our inventions and enforce our intellectual property rights, and more generally could affect the value of our intellectual property. In particular, our ability to stop third parties from making, using, selling, offering to sell, importing, or otherwise commercializing any of our patented inventions, either directly or indirectly, will depend in part on our success in obtaining, defending, and enforcing patent claims that cover our technology, inventions, and improvements. With respect to both licensed and company-owned intellectual property, we cannot be sure that patents will be granted with respect to any of our pending patent applications or with respect to any patent applications filed by us in the future, nor can we be sure that any of our existing patents or any patents that may be granted to us in the future will be commercially useful in

protecting our platform and drug candidates and the methods used to manufacture them. Moreover, our issued patents and those that may issue in the future may not guarantee us the right to practice our technology in relation to the commercialization of our platform's drug candidates. The area of patent and other intellectual property rights in biotechnology is an evolving one with many risks and uncertainties, which may prevent us from commercializing our drug candidates and future drug candidates and practicing our proprietary technology.

Our issued patents and those that may issue in the future may be challenged, narrowed, circumvented, or invalidated, which could limit our ability to stop competitors from marketing related platforms or drug candidates or limit the length of the term of patent protection that we may have for our 31 drug candidates, and future drug candidates, and platforms. In addition, the rights granted under any issued patents may not provide us with complete protection or competitive advantages against competitors with similar technology. Furthermore, our competitors may independently develop similar technologies that achieve similar outcomes but with different approaches. For these reasons, we may have competition for our drug candidates. Moreover, the time required for development, testing, and regulatory review of our candidate products may shorten the length of effective patent protection following commercialization. For this and other risks related to our proprietary technology, inventions, improvements, platforms and drug candidates, please see the section entitled "Risk Factors—Risks Related to Our Intellectual Property."

Our commercial success will also depend in part on not infringing upon the proprietary rights of third parties. It is uncertain whether the issuance of any third-party patent would require us to alter our development or commercial strategies for our products or processes, or to obtain licenses or cease certain activities. Our breach of any license agreements or failure to obtain a license to proprietary rights that we may require to develop or commercialize our future products may have an adverse impact on us. If third parties prepare and file patent applications in the United States that also claim technology to which we have rights, we may have to participate in interference or derivation proceedings in the USPTO to determine priority of invention. For more information, please see "Risk Factors—Risks Related to Our Intellectual Property."

Some of our pending patent applications in the United States are provisional patent applications. Provisional patent applications are not eligible to become issued patents until, among other things, we file a non-provisional patent application within 12 months of filing of one or more of our related provisional patent applications. If we do not timely file any non-provisional patent applications, we may lose our priority date with respect to our provisional patent applications and any patent protection on the inventions disclosed in our provisional patent applications. While we intend to timely file non-provisional patent applications relating to our provisional patent applications, we cannot predict whether any such patent applications will result in the issuance of patents that provide us with any competitive advantage.

The term of individual patents depends upon the legal term of the patents in the countries in which they are obtained. In most countries in which we file, the patent term is 20 years from the earliest date of filing a nonprovisional patent application related to the patent. However, the actual protection afforded by a patent varies on a product-by-product basis, from country to country, and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country, and the validity and enforceability of the patent. A U.S. patent also may be accorded patent term adjustment, or PTA, under certain circumstances to compensate for delays in obtaining the patent from the USPTO. In some instances, such a PTA may result in a U.S. patent term extending beyond 20 years from the earliest date of filing a non-provisional patent application related to the U.S. patent. In addition, in the United States, the term of a U.S. patent that covers an FDA-approved drug may also be eligible for patent term extension, which permits patent term restoration as compensation for the patent term lost during the FDA regulatory review process.

Trademarks

As of January 2021, our trademark portfolio comprises more than 70 registered trademarks or active trademark applications worldwide. Such portfolio includes 20 registered foreign trademarks, 30 pending foreign trademark applications, 11 registered U.S. trademarks, and 9 pending U.S. trademark applications, among which we have issued trademarks in the U.S. for “Recursion” and “Recursion Pharmaceuticals.”

Trade Secrets

In addition to our reliance on patent protection for our inventions, drug candidates and programs, we also rely on trade secrets, know-how, confidentiality agreements, and continuing technological innovation to develop and maintain our competitive position. For example, some elements of manufacturing processes, proprietary assays, analytics techniques and processes, knowledge gained through clinical experience such as approaches to dosing and administration and management of patients, as well as computational-biological algorithms, and related processes and software, are based on unpatented trade secrets and know-how that are not publicly disclosed. Although we take steps to protect our proprietary information and trade secrets, including through contractual means with our employees, advisors and consultants, these agreements may be breached, and we may not have adequate remedies for any breach. In addition, third parties may independently develop substantially equivalent proprietary information and techniques or otherwise gain access to our trade secrets or disclose our technology. As a result, we may not be able to meaningfully protect our trade secrets. It is our policy to require our employees, consultants, outside scientific collaborators, sponsored researchers, and other advisors to execute confidentiality agreements upon the commencement of employment or consulting relationships with us. These agreements provide that all confidential information concerning our business or financial affairs developed or made known to the individual or entity during the course of the party’s relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. In the case of employees, the agreements provide that all inventions conceived of by the individual during the course of employment, and which relate to or are reasonably capable or being used in our current or planned business or research and development are our exclusive property. In addition, we take other appropriate precautions, such as physical and technological security measures, to guard against misappropriation of our proprietary technology by third parties. However, such agreements and policies may be breached, and we may not have adequate remedies for such breaches. For more information regarding the risks related to our intellectual property, see “Risk Factors—Risks Related to Our Intellectual Property.”

Government Regulation

Government authorities in the United States at the federal, state and local level and in other countries regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, post-approval monitoring and reporting, marketing, and export and import of drug and biological products. Generally, before a new drug can be marketed, considerable data demonstrating its quality, safety, and efficacy must be obtained, organized into a format specific for each regulatory authority, submitted for review and approved by the regulatory authority.

U.S. Drug Development

In the United States, the FDA regulates drugs under the Food, Drug, and Cosmetic Act, or FDCA. Drugs also are subject to other federal, state, and local statutes and regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local,

and foreign statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable United States requirements at any time during the product development process, approval process or post-market may subject an applicant to administrative or judicial sanctions. These sanctions could include, among other actions, the FDA's refusal to approve pending applications, withdrawal of an approval, a clinical hold, untitled or warning letters, product recalls or market withdrawals, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement, and civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

- Our drug candidates are considered small molecule drugs and must be approved by the FDA through the new drug application, or NDA, process before they may be legally marketed in the United States. The process generally involves the following: completion of extensive preclinical studies in accordance with applicable regulations, including studies conducted in accordance with good laboratory practice, or GLP;
- submission to the FDA of an investigational new drug, or IND, application, which must become effective before human clinical trials may begin;
- approval by an independent institutional review board, or IRB, or ethics committee at each clinical trial site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with applicable IND regulations, good clinical practice, or GCP, requirements and other clinical trial-related regulations to establish substantial evidence of the safety and efficacy of the investigational product for each proposed indication;
- submission to the FDA of an NDA;
- a determination by the FDA within 60 days of its receipt of an NDA to accept the filing for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities where the drug will be produced to assess compliance with cGMP requirements to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity;
- potential FDA audit of the preclinical study and/or clinical trial sites that generated the data in support of the NDA filing;
- FDA review and approval of the NDA, including consideration of the views of any FDA advisory committee, prior to any commercial marketing or sale of the drug in the United States; and
- compliance with any post-approval requirements, including the potential requirement to implement a Risk Evaluation and Mitigation Strategy, or REMS, and the potential requirement to conduct post-approval studies.

The data required to support an NDA is generated in two distinct developmental stages: preclinical and clinical. The preclinical and clinical testing and approval process requires substantial time, effort and financial resources, and we cannot be certain that any approvals for any current and future drug candidates will be granted on a timely basis, or at all.

Preclinical Studies and IND

The preclinical developmental stage generally involves laboratory evaluations of drug chemistry, formulation, and stability, as well as studies to evaluate toxicity in animals, which support subsequent clinical testing. The sponsor must submit the results of the preclinical studies, together with

manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of the IND. An IND is a request for authorization from the FDA to administer an investigational product to humans and must become effective before human clinical trials may begin.

Preclinical studies include laboratory evaluation of product chemistry and formulation, as well as *in vitro* and animal studies to assess the potential for adverse events and in some cases to establish a rationale for therapeutic use. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations for safety/toxicology studies. An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical studies, among other things, to the FDA as part of an IND. Some long-term preclinical testing, such as animal tests of reproductive adverse events and carcinogenicity, may continue after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to one or more proposed clinical trials and places the trial on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Clinical Trials

The clinical stage of development involves the administration of the investigational product to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control, in accordance with GCP requirements, which include the requirement that all research subjects provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection, and exclusion criteria and the parameters to be used to monitor subject safety and assess efficacy. Each protocol, and any subsequent amendments to the protocol, must be submitted to the FDA as part of the IND. Furthermore, each clinical trial must be reviewed and approved by an IRB for each institution at which the clinical trial will be conducted to ensure that the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB must also approve the informed consent form that must be provided to each clinical trial subject or his or her legal representative and must monitor the clinical trial until completed. There also are requirements governing the reporting of ongoing clinical trials and completed clinical trial results to public registries.

A sponsor who wishes to conduct a clinical trial outside of the United States may, but need not, obtain FDA authorization to conduct the clinical trial under an IND. If a foreign clinical trial is not conducted under an IND, the sponsor may submit data from the clinical trial to the FDA in support of an NDA. The FDA will generally accept a well-designed and well-conducted foreign clinical trial not conducted under an IND if the trial was conducted in accordance with the ethical principles contained in the Declaration of Helsinki pursuant to 21 CFR 312.120(c)(4), incorporating the 1989 version of the Declaration, or with the laws and regulations of the foreign regulatory authority where the trial was conducted, such as the European Medicines Agency, or EMA, whichever provides greater protection of the human subjects, and with GCP and GMP requirements, and the FDA is able to validate the data through an onsite inspection, if deemed necessary, and the practice of medicine in the foreign country is consistent with the United States.

Clinical trials in the United States generally are conducted in three sequential phases, known as Phase 1, Phase 2 and Phase 3, and may overlap.

- Phase 1 clinical trials generally involve a small number of healthy volunteers or disease-affected patients who are initially exposed to a single dose and then multiple doses of the drug

candidate. The primary purpose of these clinical trials is to assess the metabolism, pharmacologic action, tolerability and safety of the drug.

- Phase 2 clinical trials involve studies in disease-affected patients to determine the dose and dosing schedule required to produce the desired benefits. At the same time, safety and further pharmacokinetic and pharmacodynamic information is collected, possible adverse effects and safety risks are identified, and a preliminary evaluation of efficacy is conducted.
- Phase 3 clinical trials generally involve a large number of patients at multiple sites and are designed to provide the data necessary to demonstrate the effectiveness of the product for its intended use, its safety in use and to establish the overall benefit/risk relationship of the product and provide an adequate basis for product approval. These trials may include comparisons with placebo and/or other comparator treatments. The duration of treatment is often extended to mimic the actual use of a product during marketing.

Post-approval trials, sometimes referred to as Phase 4 clinical trials, are conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval of an NDA.

Progress reports detailing the results of the clinical trials, among other information, must be submitted at least annually to the FDA. Sponsor is also responsible for submitting written IND safety reports, including reports of serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the drug, findings from animal or *in vitro* testing that suggest a significant risk for human subjects, and any clinically significant increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure.

Phase 1, Phase 2, and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients. Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board or committee. This group provides authorization for whether a trial may move forward at designated check-points based on access to certain data from the trial.

Concurrent with clinical trials, companies usually complete additional animal safety studies and also must develop additional information about the chemistry and physical characteristics of the drug as well as finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process, as performed by the manufacturing facility, must be capable of consistently producing quality batches of our drug candidates. Additionally, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that our drug candidates do not undergo unacceptable deterioration over their labeled shelf life.

NDA Review Process

Following completion of the clinical trials, data is analyzed to assess whether the investigational product is safe and effective for the proposed indicated use or uses. The results of preclinical studies and clinical trials are then submitted to the FDA as part of an NDA, along with proposed labeling, chemistry, and manufacturing information to ensure product quality and other relevant data. In short, the NDA is a request for approval to market the drug in the United States for one or more specified indications and must contain proof of safety and efficacy for a drug.

The application must include both negative and ambiguous results of preclinical studies and clinical trials, as well as positive findings. Data may come from company-sponsored clinical trials intended to test the safety and efficacy of a product's use or from a number of alternative sources, including studies initiated by investigators. To support marketing approval, the data submitted must be sufficient in quality and quantity to establish the safety and efficacy of the investigational product to the satisfaction of the FDA. FDA approval of an NDA must be obtained before a drug may be legally marketed in the United States.

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each NDA must be accompanied by a user fee. FDA adjusts the PDUFA user fees on an annual basis. PDUFA also imposes an annual program fee for each marketed human drug. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. Additionally, no user fees are assessed on NDAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

The FDA reviews all submitted NDAs before it accepts them for filing and may request additional information rather than accepting the NDA for filing. The FDA must make a decision on accepting an NDA for filing within 60 days of receipt. Once the submission is accepted for filing, the FDA begins an in-depth review of the NDA. Under the goals and policies agreed to by the FDA under PDUFA, the FDA has ten months, from the filing date, in which to complete its initial review of a new molecular-entity NDA and respond to the applicant, and six months from the filing date of a new molecular-entity NDA designated for priority review. The FDA does not always meet its PDUFA goal dates for standard and priority NDAs, and the review process is often extended by FDA requests for additional information or clarification.

Before approving an NDA, the FDA will conduct a pre-approval inspection of the manufacturing facilities for the new product to determine whether they comply with cGMP requirements. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. The FDA also may audit data from clinical trials to ensure compliance with GCP requirements. Additionally, the FDA may refer applications for novel drug products or drug products which present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions, if any. The FDA is not bound by recommendations of an advisory committee, but it considers such recommendations when making decisions on approval. The FDA likely will reanalyze the clinical trial data, which could result in extensive discussions between the FDA and the applicant during the review process. After the FDA evaluates an NDA, it will issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete, and the application will not be approved in its present form. A Complete Response Letter usually describes all of the specific deficiencies in the NDA identified by the FDA. The Complete Response Letter may require additional clinical data, additional pivotal Phase 3 clinical trial(s) and/or other significant and time-consuming requirements related to clinical trials, preclinical studies and/or manufacturing. If a Complete Response Letter is issued, the applicant may either resubmit the NDA, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the NDA does not satisfy the criteria for approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data.

Orphan Drugs

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biological product intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States and for which there is no reasonable expectation that the cost of developing and making the product available in the United States for this type of disease or condition will be recovered from sales of the product.

Orphan drug designation must be requested before submitting an NDA. After the FDA grants orphan drug designation, the identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product that has orphan designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications to market the same drug for the same indication for seven years from the date of such approval, except in limited circumstances, such as a showing of clinical superiority to the product with orphan exclusivity by means of greater effectiveness, greater safety, or providing a major contribution to patient care or in instances of drug supply issues. However, competitors may receive approval of either a different product for the same indication or the same product for a different indication but that could be used off-label in the orphan indication. Orphan drug exclusivity also could block the approval of one of our products for seven years if a competitor obtains approval before we do for the same product, as defined by the FDA, for the same indication we are seeking approval, or if a drug candidate is determined to be contained within the scope of the competitor's product for the same indication. If one of our products designated as an orphan drug receives marketing approval for an indication broader than that which is designated, it may not be entitled to orphan drug exclusivity. Orphan drug status in the European Union has similar, but not identical, requirements and benefits.

Expedited Development and Review Programs

The FDA has a fast track program that is intended to expedite or facilitate the process for reviewing new drugs that meet certain criteria. Specifically, new drugs are eligible for fast track designation if they are intended to treat a serious or life-threatening condition and preclinical or clinical data demonstrate the potential to address unmet medical needs for the condition. Fast track designation applies to both the product and the specific indication for which it is being studied. The sponsor can request the FDA to designate the product for fast track status any time before receiving NDA approval, but ideally no later than the pre-NDA meeting with the FDA.

Any product submitted to the FDA for marketing, including under a fast track program, may be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. Any product is eligible for priority review if it treats a serious or life-threatening condition and, if approved, would provide a significant improvement in safety and effectiveness compared to available therapies.

A product may also be eligible for accelerated approval, if it treats a serious or life-threatening condition and generally provides a meaningful advantage over available therapies. In addition, it must demonstrate an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, or IMM, which is reasonably likely to predict an effect on IMM or other clinical benefit. As a condition of approval, the FDA may require that a sponsor of a drug receiving accelerated approval perform adequate and well-

controlled post-marketing clinical trials. FDA may withdraw drug approval or require changes to the labeled indication of the drug if confirmatory post-market trials fail to verify clinical benefit or do not demonstrate sufficient clinical benefit to justify the risks associated with the drug. If the FDA concludes that a drug shown to be effective can be safely used only if distribution or use is restricted, it may require such post-marketing restrictions as it deems necessary to assure safe use of the product.

Additionally, a drug may be eligible for designation as a breakthrough therapy if the product is intended, alone or in combination with one or more other drugs or biologics, to treat a serious or life-threatening condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over currently approved therapies on one or more clinically significant endpoints. The benefits of breakthrough therapy designation include the same benefits as fast track designation, plus intensive guidance from the FDA to ensure an efficient drug development program. Fast track designation, priority review, accelerated approval and breakthrough therapy designation do not change the standards for approval, but may expedite the development or approval process.

Post-approval Requirements

Following approval of a new product, the manufacturer and the approved product are subject to continuing regulation by the FDA, including, among other things, monitoring and record-keeping requirements, requirements to report adverse events and comply with promotion and advertising requirements, which include restrictions on promoting drugs for unapproved uses or patient populations, known as “off-label promotion,” and limitations on industry-sponsored scientific and educational activities. Although physicians may prescribe legally available drugs for off-label uses, manufacturers may not market or promote such uses. Prescription drug promotional materials must be submitted to the FDA in conjunction with their first use. Further, if there are any modifications to the drug, including changes in indications, labeling, or manufacturing processes or facilities, the applicant may be required to submit and obtain FDA approval of a new NDA or NDA supplement, which may require the development of additional data or preclinical studies and clinical trials.

The FDA may also place other conditions on approvals including the requirement for REMS, to assure the safe use of the product. A REMS could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products. Product approvals may be withdrawn for non-compliance with regulatory standards or if problems occur following initial marketing.

The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical studies to assess new safety risks or imposition of distribution restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market, or product recalls;
- fines, warning letters, or holds on post-approval clinical studies;
- refusal of the FDA to approve pending applications or supplements to approved applications;
- suspension or revocation of product approvals;
- product seizure or detention;

- refusal to permit the import or export of products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA strictly regulates marketing, labeling, advertising and promotion of products that are placed on the market. Drugs may be promoted only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability.

FDA Regulation of Companion Diagnostics

A therapeutic product may rely upon an *in vitro* companion diagnostic for use in selecting the patients that will be more likely to respond to that therapy. If an *in vitro* diagnostic is essential to the safe and effective use of the therapeutic product and if the manufacturer wishes to market or distribute such diagnostic for use as a companion diagnostic, then the FDA will require separate approval or clearance of the diagnostic as a companion diagnostic to the therapeutic product. According to FDA guidance, an unapproved or uncleared companion diagnostic device used to make treatment decisions in clinical trials of a drug generally will be considered an investigational medical device unless it is employed for an intended use for which the device is already approved or cleared. If used to make critical treatment decisions, such as patient selection, the diagnostic device generally will be considered a significant risk device under the FDA's Investigational Device Exemption, or IDE, regulations. The sponsor of the diagnostic device will be required to comply with the IDE regulations for clinical studies involving the investigational diagnostic device. According to the guidance, if a diagnostic device and a drug are to be studied together to support their respective approvals, both products can be studied in the same clinical trial, if the trial meets both the requirements of the IDE regulations and the IND regulations. The guidance provides that depending on the details of the clinical trial protocol, the investigational product(s), and subjects involved, a sponsor may seek to submit an IDE alone (e.g., if the drug has already been approved by FDA and is used consistent with its approved labeling), or both an IND and an IDE.

Pursuing FDA approval/clearance of an *in vitro* companion diagnostic would require either a pre-market notification, also called 510(k) clearance, or a pre-market approval, or PMA, or a de novo classification for that diagnostic. The review of companion diagnostics involves coordination of review with the FDA's Center for Devices and Radiological Health.

510(k) clearance process

To obtain 510(k) clearance, a pre-market notification is submitted to the FDA demonstrating that the proposed device is substantially equivalent to a previously cleared 510(k) device or a device that was in commercial distribution before May 28, 1976 for which the FDA has not yet required the submission of a PMA application. The FDA's 510(k) clearance process may take three to 12 months from the date the application is submitted and filed with the FDA, but may take longer if FDA requests additional information, among other reasons. In some cases, the FDA may require clinical data to support substantial equivalence. In reviewing a pre-market notification submission, the FDA may request additional information, which may significantly prolong the review process. Notwithstanding compliance with all these requirements, clearance is never assured.

After a device receives 510(k) clearance, any subsequent modification of the device that could significantly affect its safety or effectiveness, or that would constitute a major change in its intended use, will require a new 510(k) clearance or require a PMA. In addition, the FDA may make substantial changes to industry requirements, including which devices are eligible for 510(k) clearance, which may significantly affect the process.

De novo classification process

If a new medical device does not qualify for the 510(k) pre-market notification process because no predicate device to which it is substantially equivalent can be identified, the device is automatically classified into Class III. The Food and Drug Administration Modernization Act of 1997 established a different route to market for low to moderate risk medical devices that are automatically placed into Class III due to the absence of a predicate device, called the "Request for Evaluation of Automatic Class III Designation," or the de novo classification process. This process allows a manufacturer whose novel device is automatically classified into Class III to request down-classification of its medical device into Class I or Class II on the basis that the device presents low or moderate risk, rather than requiring the submission and approval of a PMA. If the manufacturer seeks reclassification into Class II, the manufacturer must include a draft proposal for special controls that are necessary to provide a reasonable assurance of the safety and effectiveness of the medical device. The FDA may reject the reclassification petition if it identifies a legally marketed predicate device that would be appropriate for a 510(k) or determines that the device is not low to moderate risk and requires PMA or that general controls would be inadequate to control the risks and special controls cannot be developed.

Obtaining FDA marketing authorization, de novo down-classification, or approval for medical devices is expensive and uncertain, and may take several years, and generally requires significant scientific and clinical data.

PMA process

The PMA process, including the gathering of clinical and nonclinical data and the submission to and review by the FDA, can take several years or longer. The applicant must prepare and provide the FDA with reasonable assurance of the device's safety and effectiveness, including information about the device and its components regarding, among other things, device design, manufacturing, and labeling. PMA applications are subject to an application fee. In addition, PMAs for medical devices must generally include the results from extensive preclinical and adequate and well-controlled clinical trials to establish the safety and effectiveness of the device for each indication for which FDA approval is sought. In particular, for a diagnostic, the applicant must demonstrate that the diagnostic produces reproducible results. As part of the PMA review, the FDA will typically inspect the manufacturer's facilities for compliance with the Quality System Regulation, or QSR, which imposes extensive testing, control, documentation, and other quality assurance and GMP requirements.

Other U.S. Regulatory Matters

- Our current and future arrangements with healthcare providers, third-party payors, customers, and others may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations, which may constrain the business or financial arrangements and relationships through which we research, as well as, sell, market, and distribute any products for which we obtain marketing approval. The applicable federal, state and foreign healthcare laws and regulations that may affect our ability to operate include, but are not limited to: the federal Anti-Kickback Statute, which makes it illegal for any person, including a prescription drug or medical device manufacturer (or a party acting on its behalf), to knowingly and willfully solicit, receive, offer or pay any remuneration that is intended to induce or reward referrals, including the purchase, recommendation, order or prescription of a particular drug, for which payment may be made under a federal healthcare program, such as Medicare or Medicaid. Moreover, the ACA (as defined below) provides that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;

- The federal false claims, including the civil False Claims Act that can be enforced by private citizens through civil whistleblower or qui tam actions, and civil monetary penalties prohibit individuals or entities from, among other things, knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government, and/or impose exclusions from federal health care programs and/or penalties for parties who engage in such prohibited conduct;
- The Federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, prohibits, among other things, executing or attempting to execute a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, and their implementing regulations also impose obligations on covered entities such as health insurance plans, healthcare clearinghouses, and certain health care providers and their respective business associates, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- The federal Physician Payments Sunshine Act requires applicable manufacturers of covered drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, with specific exceptions, to annually report to Centers for Medicare & Medicaid Services, or CMS, information regarding certain payments and other transfers of value to physicians and teaching hospitals as well as information regarding ownership and investment interests held by physicians and their immediate family members; and
- Analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, state laws that require biotechnology companies to comply with the biotechnology industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government; state and local laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures and require the registration of their sales representatives, state laws that require biotechnology companies to report information on the pricing of certain drug products, and state and foreign laws that govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Pricing and rebate programs must also comply with the Medicaid rebate requirements of the U.S. Omnibus Budget Reconciliation Act of 1990 and more recent requirements in the ACA (as defined below). If products are made available to authorized users of the Federal Supply Schedule of the General Services Administration, additional laws and requirements apply. Manufacturing, sales, promotion, and other activities also are potentially subject to federal and state consumer protection and unfair competition laws. In addition, the distribution of pharmaceutical and/or medical device products is subject to additional requirements and regulations, including extensive record-keeping, licensing, storage, and security requirements intended to prevent the unauthorized sale of pharmaceutical and/or medical device products. Products must meet applicable child-resistant packaging requirements under the U.S. Poison Prevention Packaging Act as well as other applicable consumer safety requirements.

The failure to comply with any of these laws or regulatory requirements subjects firms to possible legal or regulatory action. Depending on the circumstances, failure to meet applicable regulatory requirements can result in significant civil, criminal and administrative penalties, including damages,

fines, disgorgement, imprisonment, exclusion from participation in government funded healthcare programs, such as Medicare and Medicaid, integrity oversight and reporting obligations, contractual damages, reputational harm, diminished profits and future earnings, injunctions, requests for recall, seizure of products, total or partial suspension of production, denial or withdrawal of product approvals or refusal to allow a firm to enter into supply contracts, including government contracts.

U.S. Patent-term Restoration and Marketing Exclusivity

Depending upon the timing, duration, and specifics of FDA approval of any future drug candidates, some of our U.S. patents may be eligible for limited patent term extension under the Hatch-Waxman Act. The Hatch-Waxman Act permits restoration of the patent term of up to five years as compensation for patent term lost during product development and FDA regulatory review process. Patent-term restoration, however, cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. The patent-term restoration period is generally one-half the time between the effective date of an IND or the issue date of the patent, whichever is later, and the submission date of an NDA plus the time between the submission date of an NDA or the issue date of the patent, whichever is later, and the approval of that application, except that the review period is reduced by any time during which the applicant failed to exercise due diligence. Only one patent applicable to an approved drug, a method for using it, or a method of manufacturing it, is eligible for the extension and the application for the extension must be submitted prior to the expiration of the patent. The USPTO, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. In the future, if and when our products receive FDA approval, we may apply for restoration of patent term for our currently owned or licensed patents covering products eligible for patent term extension to add patent life beyond its current expiration date, depending on the expected length of the clinical trials and other factors involved in the filing of the relevant NDA. Similar provisions are available in Europe and certain other jurisdictions to extend the term of a patent that covers an approved drug. We may seek patent term extension for any of our issued or licensed patents in any jurisdiction where these are available; however, there is no guarantee that the applicable authorities, including the FDA in the United States, will agree with our assessment of whether such extensions should be granted, and if granted, the length of such extensions.

Market exclusivity provisions under the FDCA also can delay the submission or the approval of certain applications. The FDCA provides a five-year period of non-patent marketing exclusivity within the United States to the first applicant to gain approval of an NDA for an NCE. A drug is an NCE if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance. During the exclusivity period, the FDA may not accept for review an abbreviated new drug application, or ANDA, or a 505(b)(2) NDA submitted by another company for a generic version of such drug where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement. The FDCA also provides three years of marketing exclusivity for an NDA, 505(b)(2) NDA or supplement to an existing NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example, new indications, dosages or strengths of an existing drug. This three-year exclusivity covers only the conditions of use associated with the new clinical investigations and does not prohibit the FDA from approving ANDAs for drugs containing the original active agent. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness or generate such data themselves.

European Union Drug Development

Similar to the United States, the various phases of preclinical and clinical research in the European Union are subject to significant regulatory controls. Although the EU Clinical Trials Directive 2001/20/EC has sought to harmonize the EU clinical trials regulatory framework, setting out common rules for the control and authorization of clinical trials in the EU, the EU Member States have transposed and applied the provisions of the Directive differently. This has led to significant variations in the member state regimes. Under the current regime, before a clinical trial can be initiated, it must be approved in each of the EU countries where the trial is to be conducted by two distinct bodies: the National Competent Authority, NCA, and one or more Ethics Committees, or ECs. Under the current regime all suspected unexpected serious adverse reactions to the investigated drug that occur during the clinical trial have to be reported to the NCA and ECs of the Member State where they occurred.

The EU clinical trials legislation currently is undergoing a transition process mainly aimed at harmonizing and streamlining clinical-trial authorization, simplifying adverse-event reporting procedures, improving the supervision of clinical trials, and increasing their transparency. Recently enacted Clinical Trials Regulation EU No 536/2014 ensures that the rules for conducting clinical trials in the EU will be identical. In the meantime, Clinical Trials Directive 2001/20/EC continues to govern all clinical trials performed in the EU.

European Union Drug Review and Approval

In the European Economic Area, or EEA, which is composed of the 28 Member States of the European Union and three European Free Trade Association States (Norway, Iceland, and Liechtenstein), medicinal products can only be commercialized after obtaining a Marketing Authorization, or MA. There are two types of marketing authorizations.

- The Community MA is issued by the European Commission through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use, or CHMP, of the EMA, and is valid throughout the entire territory of the EEA. The Centralized Procedure is mandatory for certain types of products, such as biotechnology medicinal products, orphan medicinal products, advanced-therapy medicines such as gene-therapy, somatic cell-therapy or tissue-engineered medicines and medicinal products containing a new active substance indicated for the treatment of HIV, AIDS, cancer, neurodegenerative disorders, diabetes, auto-immune and other immune dysfunctions and viral diseases. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EEA, or for products that constitute a significant therapeutic, scientific, or technical innovation or which are in the interest of public health in the EU.
- National MAs, which are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member States through the Mutual Recognition Procedure. If the product has not received a National MA in any Member State at the time of application, it can be approved simultaneously in various Member States through the Decentralized Procedure. Under the Decentralized Procedure an identical dossier is submitted to the competent authorities of each of the Member States in which the MA is sought, one of which is selected by the applicant as the Reference Member State, or RMS. The competent authority of the RMS prepares a draft assessment report, a draft summary of the product characteristics, or SOPC, and a draft of the labeling and package leaflet, which are sent to the other Member States (referred to as the Member States Concerned) for their approval. If the Member States Concerned raise no objections, based on a potential serious risk to public health, to the assessment, SOPC, labeling or packaging

proposed by the RMS, the product is subsequently granted a national MA in all the Member States (i.e., in the RMS and the Member States Concerned).

Under the above described procedures, before granting the MA, EMA or the competent authorities of the Member States of the EEA make an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety, and efficacy. Similar to the U.S. patent term-restoration, Supplementary Protection Certificates, or SPCs, serve as an extension to a patent right in Europe for up to five years. SPCs apply to specific pharmaceutical products to offset the loss of patent protection due to the lengthy testing and clinical trials these products require prior to obtaining regulatory marketing approval.

Coverage and Reimbursement

Sales of our products will depend, in part, on the extent to which our products will be covered by third-party payors, such as government health programs, commercial insurance and managed healthcare organizations. There is significant uncertainty related to third-party payor coverage and reimbursement of newly approved products. In the United States, for example, principal decisions about reimbursement for new products are typically made by CMS. CMS decides whether and to what extent a new product will be covered and reimbursed under Medicare, and private third-party payors often follow CMS's decisions regarding coverage and reimbursement to a substantial degree. However, no uniform policy of coverage and reimbursement for drug products exists. Accordingly, decisions regarding the extent of coverage and amount of reimbursement to be provided for any of our products will be made on a payor-by-payor basis.

Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. Further, such payors are increasingly challenging the price, examining the medical necessity, and reviewing the cost effectiveness of medical drug candidates. There may be especially significant delays in obtaining coverage and reimbursement for newly approved drugs. Third-party payors may limit coverage to specific drug candidates on an approved list, known as a formulary, which might not include all FDA-approved drugs for a particular indication. We may need to conduct expensive pharmaco-economic studies to demonstrate the medical necessity and cost effectiveness of our products. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be obtained.

In addition, companion diagnostic tests require coverage and reimbursement separate and apart from the coverage and reimbursement for their companion pharmaceutical or biological products. Similar challenges to obtaining coverage and reimbursement, applicable to pharmaceutical or biological products, will apply to companion diagnostics.

In addition, in most foreign countries, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing and reimbursement vary widely from country to country. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the medicinal product on the market. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. Historically, products launched in the European Union do not follow price structures of the United States and generally prices tend to be significantly lower.

Healthcare Reform

The Medicare Prescription Drug, Improvement, and Modernization Act of 2003, or MMA, established the Medicare Part D program to provide a voluntary prescription drug benefit to Medicare beneficiaries. Under Part D, Medicare beneficiaries may enroll in prescription drug plans offered by private entities that provide coverage of outpatient prescription drugs. Unlike Medicare Part A and B, Part D coverage is not standardized. While all Medicare drug plans must give at least a standard level of coverage set by Medicare, Part D prescription drug plan sponsors are not required to pay for all covered Part D drugs, and each drug plan can develop its own drug formulary that identifies which drugs it will cover and at what tier or level. However, Part D prescription drug formularies must include drugs within each therapeutic category and class of covered Part D drugs, though not necessarily all the drugs in each category or class. Any formulary used by a Part D prescription drug plan must be developed and reviewed by a pharmacy and therapeutic committee. Government payment for some of the costs of prescription drugs may increase demand for products for which we receive marketing approval. However, any negotiated prices for our products covered by a Part D prescription drug plan likely will be lower than the prices we might otherwise obtain. Moreover, while the MMA applies only to drug benefits for Medicare beneficiaries, private third-party payors often follow Medicare coverage policy and payment limitations in setting their own payment rates.

The United States government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid healthcare costs, including price-controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs. For example, the Patient Protection and Affordable Care Act of 2010, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively, the ACA, was passed which substantially changed the way healthcare is financed by both the government and private insurers, and significantly impacts the U.S. pharmaceutical industry. The ACA contains provisions that may reduce the profitability of drug products through increased rebates for drugs reimbursed by Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. The Medicaid Drug Rebate Program requires pharmaceutical manufacturers to enter into and have in effect a national rebate agreement with the U.S. Department of Health and Human Services, or HHS, Secretary as a condition for states to receive federal matching funds for the manufacturer's outpatient drugs furnished to Medicaid patients. The ACA made several changes to the Medicaid Drug Rebate Program, including increasing pharmaceutical manufacturers' rebate liability by raising the minimum basic Medicaid rebate on most branded prescription drugs from 15.1% of average manufacturer price, or AMP, to 23.1% of AMP and adding a new rebate calculation for "line extensions" (i.e., new formulations, such as extended release formulations) of solid oral dosage forms of branded products, as well as potentially impacting their rebate liability by modifying the statutory definition of AMP. The ACA also expanded the universe of Medicaid utilization subject to drug rebates by requiring pharmaceutical manufacturers to pay rebates on Medicaid managed care utilization and by enlarging the population potentially eligible for Medicaid drug benefits. Additionally, for a drug product to receive federal reimbursement under the Medicaid or Medicare Part B programs or to be sold directly to U.S. government agencies, the manufacturer must extend discounts to entities eligible to participate in the 340B drug pricing program. The required 340B discount on a given product is calculated based on the AMP and Medicaid rebate amounts reported by the manufacturer.

Some of the provisions of the ACA have yet to be implemented, and there have been judicial and Congressional challenges to certain aspects of the ACA, as well as recent efforts by the Trump administration to repeal or replace certain aspects of the ACA. Since January 2017, President Trump has signed two Executive Orders and other directives designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance

mandated by the ACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the ACA. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the ACA have passed. On December 22, 2017, President Trump signed into law new federal tax legislation commonly referred to as the Tax Cuts and Jobs Act, or the Tax Act, which includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." On January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices. The Bipartisan Budget Act of 2018, or the BBA, among other things, amended the ACA, effective January 1, 2019, to close the coverage gap in most Medicare Part D drug plans. In December 2018, CMS published a new final rule permitting further collections and payments to and from certain ACA-qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. On December 14, 2018, a Texas U.S. District Court Judge ruled that the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress as part of the Tax Act. While the Texas U.S. District Court Judge, as well as the Trump administration and CMS, have stated that the ruling will have no immediate effect pending appeal of the decision, it is unclear how this decision, subsequent appeals and other efforts to repeal and replace the ACA will impact the ACA.

Other legislative changes have been proposed and adopted in the United States since the ACA was enacted. These changes included aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, effective April 1, 2013, which, due to subsequent legislative amendments, will stay in effect through 2029 unless additional congressional action is taken. In January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several providers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These new laws may result in additional reductions in Medicare and other healthcare funding, which could have a material adverse effect on customers for our drugs, if approved, and accordingly, our financial operations.

Additionally, there has been heightened governmental scrutiny recently over the manner in which drug manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs and reform government program reimbursement methodologies for drug products. For example, at the federal level, the Trump administration's budget proposals for fiscal years 2019 and 2020 contain further drug price control measures that could be enacted during the budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low-income patients. Additionally, the Trump administration's budget proposals for fiscal years 2019 and 2020 contain further drug price control measures that could be enacted during the budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low-income patients. Additionally, the Trump Administration released a "Blueprint" to lower drug prices and reduce out of pocket costs of drugs that contains additional proposals to increase manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products and reduce the out of pocket costs of drug products paid by consumers. Although a number of these

and other measures may require additional authorization to become effective, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing.

Strategic Agreements

In order to achieve our mission, we partner with leading biotechnology companies, pharmaceutical companies, and academic research institutions to identify novel therapeutics and unlock biological insights using our discovery technology. Our partnering efforts take two primary forms: i) Discovery Platform Partnerships and ii) Asset-Based Collaborations.

Discovery Platform Partnerships

We have and in the future may collaborate with third parties to broadly explore diverse disease domains (e.g., fibrosis, neuroscience, oncology, immunology, and inflammation) in order to identify potential therapeutics. We may also explore a communal asset-type strategy where we license search results from our Map to partners. While our partnerships to date have focused on small molecule research, future partnerships may extend into novel therapeutic modalities including large molecules, gene therapies, and cell therapies.

The goal of every partnership is to create therapeutics, yet the approach may take multiple forms:

- *Novel Therapeutics*. Without any presumptive target hypothesis, we can identify differentiated therapeutics by rapidly evaluating large (hundreds to hundreds of thousands) compound libraries alongside existing or de novo disease models informed by our partner's subject matter expertise.
- *Novel Targets*. By profiling diverse biological perturbations (e.g., genetic, soluble factors) on our platform, we may be able to identify novel druggable targets that we can then exploit with partners to generate therapeutic candidates.

Bayer

In August 2020, we entered into a Research Collaboration and Option Agreement, the Bayer Agreement, with Bayer AG, or Bayer, for a five-year term pursuant to which we and Bayer may initiate more than ten research projects related to fibrosis across multiple organ systems, including lung, liver, and heart. Under the agreement, we contributed approximately 190,000 compounds from our proprietary library and Bayer contributed approximately 500,000 compounds from its proprietary library and will contribute scientific expertise throughout the collaboration. With respect to each research project, we and Bayer will jointly own the intellectual property rights in the project results that are created in the course of such project, subject to certain limitations on usage, and each party grants the other a worldwide, non-exclusive, royalty-free license, without the right to sublicense, under its right, title, and interest to the intellectual property and know-how arising from such project, as well as to certain background intellectual property and know-how, and to the contributed libraries and intellectual property rights therein to the extent necessary to enable the other party to perform its tasks and obligations under a project plan for the research project. We received an upfront technology access fee of $30 million as part of the agreement.

During the term of the Bayer Agreement, we are prohibited from conducting research and development activities using our proprietary methods for compound management, high-throughput

screening lab, data analysis algorithms, high-dimensional phenotypic and other assays, engineering infrastructure, and databases outside of the collaboration either by itself or together with third parties in the field of fibrosis.

Under each research project, we will work with Bayer to develop screening hypotheses of relevance for fibrotic diseases and biological models suitable for screening compounds in order to identify potential candidates for development. Bayer may exercise certain options through identification of a development candidate that meets certain criteria. Under each such exclusive license, we would receive an option exercise fee, with the potential to receive further development and commercial milestones of more than $100 million as well as tiered royalties.

If Bayer does not exercise its option with respect to a development candidate or otherwise discontinues a research project prior to completion, within a specified period of time, we may exercise an option to negotiate with Bayer in good faith to obtain an exclusive license under Bayer's interest in any lead series or development candidate developed pursuant to the research project and backup compounds related to thereto, as well as a non-exclusive license under Bayer's background intellectual property necessary for our use of the project results related to such compounds.

The agreement contains customary termination provisions. As of the date of this Prospectus, we and Bayer have not entered into any lead series or development candidate license agreements.

Sanofi-Genzyme

In April 2016, we entered into an agreement with Genzyme Corporation, or Sanofi-Genzyme, which governs a multi-year research collaboration under which the parties collaborate to identify drug candidates for rare genetic disease from a small compound library, provided by Sanofi-Genzyme, using our in-house models of genetic diseases.

Under the agreement, Sanofi-Genzyme has an option to develop products targeting any new identifications identified.

Asset-Based Collaborations

In addition to NCEs, the Recursion Map may discover new uses for known chemical entities owned or controlled by third parties. In such circumstances, we may license rights to these assets in order to advance these programs internally. Following are four such enabling licensing agreements underlying our four clinical stage programs.

REC-994: University of Utah Research Foundation Agreements

In February 2016, we entered into an Amended and Restated License Agreement with the University of Utah Research Foundation, or UURF, pursuant to which we obtained an exclusive license under certain patents and a non-exclusive license under certain know-how, in each case controlled by UURF and related to the drug tempol, or REC-994, to make, have made, use, offer to sell, sell, import, and distribute products incorporating REC-994 worldwide for the treatment of cerebral cavemous malformation, or CCM. In partial consideration for the license rights, we issued UURF equity in our company. In addition, we agreed to reimburse UURF for a specified portion of costs associated with the filing, maintenance, and prosecution of the licensed patent rights. The Amended and Restated License Agreement will expire on a country-by-country basis upon the expiration of the last-to-expire patent within the patent rights in the applicable country. UURF may terminate the agreement for our uncured material breach, if we cease commercially diligent efforts to develop or commercialize a licensed product or service, or our bankruptcy or insolvency.

REC-2282: Ohio State Innovation Foundation In-License

In December 2018, we entered into an Exclusive License Agreement with the Ohio State Innovation Foundation, or OSIF, pursuant to which we obtained an exclusive, sublicensable, non-transferable, royalty-bearing license under certain patents and fully-paid up, royalty-free, nonexclusive license under certain know-how, in each case controlled by OSIF and related to the pan-histone deacetylase inhibitor, OSU-HDAC42, or REC-2282, to develop, make, have made, use, sell, offer for sale, and import products incorporating OSU-HDAC42 worldwide. OSIF also assigned certain assets to us, relating to the pharmaceutical composition known as AR-42. OSIF retains the right to use and allow other academic, non-profit and government institutions to use the licensed intellectual property for research, non-commercial and educational purposes. OSIF shall not practice, have practiced, or transfer such reserved rights for any clinical purpose other than completion of the existing clinical trials at the time of the license agreement without our prior written consent. We are developing REC-2282 for the treatment of NF2 and are evaluating the utility of the compound in additional disease states using our platform.

Pursuant to the agreement, we must use commercially reasonable efforts to commercialize licensed products and are required to meet certain diligence milestones within two years following the execution of the agreement, including initiation of clinical trials. The license agreement is also limited by and made subject to certain rights and regulations of the government, including the Bayh-Dole Act.

In consideration for the license, we paid OSIF an upfront payment of $2 million dollars and are obligated to pay OSIF certain milestones, totaling up to $20 million dollars, as well as mid-single digit royalties on net sales of the licensed products. In addition, we owe 25% of any non-royalty sublicensing consideration prior to a Phase II clinical trial or 15% of such sublicensing consideration after initiation of a Phase II clinical trial, provided that milestone payments are creditable against these sublicensing fees. As of the date of this Prospectus, we have not made any milestone or royalty payments to OSIF.

The agreement expires on the expiration of the last valid claim within the licensed patents. We may terminate this agreement on 90 days' prior written notice to OSIF. Either party may terminate the agreement on 60 days' prior written notice for an uncured, material breach by the other party, or bankruptcy or insolvency of the other party.

REC-3599: Chromaderm License Agreement

In December 2019, we entered into a License Agreement with Chromaderm, Inc., or Chromaderm, pursuant to which we obtained an exclusive, sublicensable, worldwide license under certain know-how and future patents that may arise controlled by Chromaderm to develop, manufacture, and commercialize products containing ruboxistaurin, an inhibitor of protein kinase C, in non-topical formulations for all uses other than the treatment, prevention, and/or diagnosis of skin hyperpigmentation conditions or disorders. Chromaderm obtained an exclusive license from Eli Lilly to certain intellectual property necessary for the development, commercialization, and manufacture of ruboxistaurin and has developed certain additional intellectual property. Chromaderm reserved the right to use the licensed intellectual property to fulfill its obligations under supply and manufacturing agreements with us, and both Chromaderm and Eli Lilly reserved rights to use the licensed intellectual property to fulfill obligations under existing agreements and in the case of Eli Lilly for internal research. We are developing ruboxistaurin, or REC-3599, in various indications, including GM2. We are required to use commercially reasonable efforts to develop and commercialize the licensed products in the territory in accordance with a specified development plan as may be modified by us at any time in our sole discretion.

Under the agreement, we paid Chromaderm an upfront payment of $1.25 million. We are obligated to pay Chromaderm certain development milestones with respect to the licensed products,

totaling up to $35.5 million for a first indication, and up to $52.5 million if multiple indications are pursued, and certain commercial milestones totaling up to $49 million. Finally, we will owe Chromaderm mid-single-digit to low-double-digit tiered royalties on net sales of REC-3599. As of the date of this Prospectus, we have not made any milestone or royalty payments to Chromaderm.

The agreement will expire, on a licensed product-by-licensed product basis, country-by-country basis upon the later of (a) the last to expire of the licensed patents applicable to the development, manufacture or commercialization of a licensed product in such country, (b) ten years from the first commercial sale of licensed product in such country, or (c) the expiration of regulatory exclusivity of such licensed product in such country. We may terminate the agreement on 90 days' prior written notice to Chromaderm. Either party may terminate the agreement upon 45 days' prior written notice (15 days' for payment breaches) for an uncured, material breach by the other party.

REC-4881: Takeda License Agreement

In May 2020, we entered into a License Agreement, or the Takeda In-License, with Takeda Pharmaceutical Company Limited, or Takeda, pursuant to which we obtained an exclusive (even as to Takeda and its affiliates), worldwide, sublicensable under certain conditions, transferable, royalty-bearing license to certain Takeda patents, know-how and materials related to develop, manufacture and commercialize Takeda's clinical-stage compound known as TAK-733, a non-ATP-competitive allosteric inhibitor of MEK1 and MEK2, subject to a non-exclusive, royalty-free, irrevocable, fully paid up, license back to Takeda to use the licensed compounds for non-clinical research purposes. We are currently developing the compound as REC-4881 for the treatment of FAP, and patients with spontaneous *APC*-mutant tumors. We are also evaluating the utility of the compound in additional disease states using our platform.

We are required to use commercially reasonable efforts to develop and commercialize at least one licensed product in each of (a) the US, (b) at least three of the following European countries: the United Kingdom, France, Germany, Italy, and Spain, and (c) Japan.

Upon execution of the agreement, we paid an upfront fee of $1.5 million to Takeda. Under the Takeda In-License, we are obligated to pay Takeda milestones amounts totaling up to $39.5 million upon achievement of specified development and regulatory milestone events. In addition, we are obligated to pay Takeda low-to-mid single-digit royalties based on net sales of products containing the licensed compounds by us, our affiliates or sublicensees, subject to specified reductions. Our obligation to pay royalties continues on a country-by-country basis until the latest of expiration of the last to expire patent licensed by Takeda that covers the product, expiration of any regulatory exclusivity period for the product and ten years after the first commercial sale of the product, in such country. As of the date of this Prospectus, we have not made any milestone or royalty payments to Takeda.

Each party has the right to terminate the license agreement for the other party's material uncured breach, insolvency or bankruptcy. In addition, we may terminate the agreement without cause any time after May 2023, and Takeda may terminate the agreement if we have not conducted any material activities in support of the development or commercialization of the licensed compounds or any product containing a licensed compound and have not demonstrated that we used commercially reasonable efforts towards the development of such compounds or products for a period of 12 consecutive months and such failure is not due to events beyond our reasonable control. Further, Takeda may terminate the license agreement if we challenge the validity or enforceability of a licensed patent. Upon termination for any reason other than for Takeda's breach of the license agreement, upon Takeda's request we are obligated to negotiate in good faith, for a period of 120 days, terms and conditions of a license to Takeda under certain technology developed by us during the term of the agreement for the purpose of developing, commercializing and otherwise exploiting the licensed compounds and products containing the licensed compounds.

Competition

We are a clinical-stage biotechnology company utilizing advanced technologies across biology, chemistry, automation, and computer science to discover and design therapeutics at unprecedented scale and efficiency. Our efforts to date have resulted in a pipeline of 35 differentiated programs in early discovery and preclinical development and four clinical-stage programs as well as an intellectual property portfolio comprising patents, trademarks, software and trade secrets. We believe that our differentiated approach to technology-enabled drug discovery, a combination of both wet lab and computational approaches and embodied by the Recursion Map, provides us with a significant competitive advantage.

We are a hybrid company, comprising the best elements of technology-enabled drug discovery companies, scalable platform companies and traditional biopharmaceutical companies. As such, we compete within multiple categories of the pharmaceutical and biotechnology industries where companies are similarly working to integrate rapidly advancing technologies into their drug discovery and development activities and/or are creating scalable scientific platforms with the potential to generate large therapeutic pipelines and where other companies are developing therapies targeting indications we are or may choose to pursue. While we believe we have the competitive advantages referred to above, we face competition from major pharmaceutical and biotechnology companies, academic institutions, governmental agencies, consortiums and public and private research institutions, among others, many of whom have significantly greater resources than us. Notable competitors include:

- ***Technology-Enabled Drug Discovery Companies***. Such companies apply sophisticated computational tools to unlock novel insights or accelerate drug discovery and development across different points in the value chain. Representative examples include Relay Therapeutics, AbCellera, Schrodinger, Insitro, Valo Health, Cellarity, and Atomwise.
- ***Scalable Platform Companies.*** Such companies are applying novel scientific approaches or engineering novel therapeutic modalities with the potential to seed large numbers of first-in-class therapeutic candidates. These companies may compete directly with our pipeline of predominantly small molecule therapeutics. Representative companies include Moderna, BioNTech, CureVac and BridgeBio.
- ***Traditional Biopharmaceutical Companies.*** Such companies, while primarily engaged in late-stage clinical development and product commercialization, are increasingly making their own investments in the application of ML and advanced computational tools across the drug discovery and development value chain. Such investments may include partnerships with other biotechnology companies (including Recursion) from which we may benefit. Representative companies include Novartis, Janssen (a subsidiary of Johnson & Johnson), Roche, Merck, and Pfizer.

Legal Proceedings

From time to time, we may become involved in legal proceedings or be subject to claims arising in the ordinary course of our business. We are not currently a party to any material legal proceedings. Regardless of outcome, such proceedings or claims can have an adverse impact on us because of defense and settlement costs, diversion of resources and other factors, and there can be no assurances that favorable outcomes will be obtained.

MANAGEMENT

Executive Officers, Key Employees, and Directors

The following table sets forth the names and positions of our executive officers, key employees, and directors and their ages as of December 31, 2020:

Name	Age	Position
Executive Officers:		
Christopher Gibson	37	Chief Executive Officer and Director
Ramona Doyle	61	Chief Medical Officer
Tina Marriott Larson	46	Chief Operating Officer and President
Michael Secora	38	Chief Financial Officer
Shafique Virani	49	Chief Corporate Development Officer
Key Employees:		
Louisa Daniels	63	Chief Legal Officer
Sharathchandra Hegde	57	Chief Scientific Officer
Heather Kirkby	48	Chief People Officer
Benjamin Mabey	38	Chief Technology Officer
Mason Victors	33	Chief Product Officer
Non-employee Directors:		
Zachary Bogue.(2)(4)	45	Director
Blake Borgeson.(3)(4)	39	Director
Terry-Ann Burrell(1)(4)	43	Director
R. Martin Chavez(1)	56	Director
Zavain Dar(1)(3)(4)	32	Director
Robert Hershberg(2)	57	Director
Dean Li(2)(3)	58	Director

(1) Member of the audit committee
(2) Member of the compensation committee
(3) Member of the nominating and corporate governance committee
(4) Member of the social responsibility committee

Executive Officers

Christopher Gibson, Ph.D., is our co-founder, Chief Executive Officer since the company's founding in November 2013. Dr. Gibson was also Chairman of our Board from the company's founding until he asked, with the support of the rest of the Board, for Dr. R. Martin Chavez to accept a position of Chairman in January 2021. Previously, Dr. Gibson was an M.D./Ph.D. student at the University of Utah. After completing his Ph.D., he took a leave of absence from medical school to build Recursion. He has undergraduate degrees in bioengineering (B.S.) and managerial studies (B.A.) with honors from Rice University. Dr. Gibson is deeply committed to contributing to the burgeoning life science hub in Utah. As part of that work, he has served as a Founding Chairman of the Board of BioHive (the Utah life science collective and branding effort, composed of therapeutics, diagnostics, medical device and health IT companies, along with the companies that support them and the public sector) since November 2020. He also serves as a Board member of BioUtah (the Utah life science industry association) since January 2019, Board member of the Recursion Foundation (our not-for-profit entity seeking to promote corporate social responsibility) since November 2019, through which he is on the Board of Altitude Lab (an incubator/accelerator focused on creating the next generation of diverse biotech founder in Utah) since July 2020. Dr. Gibson has also served on the Cures Acceleration Network Review Board since September 2020 at the Request of the Director of the National Center for

Accelerating Translational Sciences, a division of the National Institute of Health. Dr. Gibson is co-author of more than a dozen peer-reviewed studies in a variety of journals including *Nature, Nature Protocols, Circulation, the Journal of Clinical Investigation, Molecular Pharmaceutics, PloS One,* and *Diabetes.* Our Board believes Dr. Gibson is qualified to serve on our Board because of his scientific and technical background and his knowledge and perspective of the Company.

Ramona Doyle, M.D., has served as our Chief Medical Officer since December 2020. Prior to joining us, Dr. Doyle served as Chief Executive Officer of the MAVEN Project, a telehealth nonprofit, from September 2020 to present. Dr. Doyle has served as a Clinical Professor of Medicine at University of California San Francisco Medical Center from October 2011 to present and as an attending physician at Zuckerberg San Francisco General Hospital and Trauma Center from December 2016 to present. Dr. Doyle previously served as the Chief Medical Officer of Blade Therapeutics from January 2017 to May 2018 and as Vice President at the California Institute for Regenerative Medicine from July 2015 to July 2016. Dr. Doyle also served as an Associate Professor of Medicine at Stanford University from 1995 to 2008. Dr. Doyle holds a B.A. in English Language and Literature from The University of the South and a B.A. and an M.S. in Physiology from the University of Oxford. Dr. Doyle also holds an M.D. from Emory University School of Medicine and is board certified in Internal Medicine, Pulmonary Medicine and Critical Care Medicine by the American Board of Internal Medicine.

Tina Marriott Larson has served as our Chief Operating Officer since July 2018 and as our President since October 2019. She was previously Senior Vice President, Executive Committee member, and Compliance Committee member at Achaogen, a publicly traded biopharmaceutical company that discovered, developed and commercialized treatments for infectious disease from May 2016 to June 2018. She built Achaogen's technical operations team—accountable for process development, supply chain and diagnostic development—to launch ZEMDRI®. Prior to Achaogen, she was Global Head of Technical Development Business Operations at Roche from October 2014 to April 2016, where she was responsible for business and technology infrastructure. She spent a total of 20 years at Genentech/Roche in technical operations roles that included Automation Engineer, Associate Director Manufacturing Sciences, Director Process Development Engineering and Senior Director Technical Development Operations & Engineering. She has both deep technical expertise in scale-up of biopharmaceutical production and managing technical and operational organizations. Ms. Larson has been recognized by the Healthcare Business Women's Association as a Rising Star, *Utah Business* magazine as CXO of the Year and a Women Tech Council Awards, winner. She has served on the advisory board of Colorado State University's College of Engineering since 2015 and was recognized in 2019 as a CSU Distinguished Alumni. Ms. Larson holds a B.S. in Chemical Engineering from Colorado State University.

Michael Secora, Ph.D., has served as our Chief Financial Officer since March 2020. Prior to joining us, Dr. Secora worked at Laurion Capital Management, as an asset manager based in New York City from July 2010 to February 2020, where he was Managing Director and Head of Capital Markets and Venture. During his time at Laurion, he developed, executed and managed fundamentally grounded investment strategies as well as built business partnerships and technological infrastructure for investing in event-driven, fundamental and macroeconomic contexts. Dr. Secora was active in venture, crossover, capital markets, public and special situations investing particularly within emerging technologies and the life sciences. As a scientist and investor in both the spaces of technology and biotechnology, he was attracted to technology-enabled drug discovery where he observed the emergence and evolution of the space, having met, evaluated, worked with, or invested in prominent companies in that space. Given Dr. Secora's deeply analytical approach to investing, activity within the capital markets complex, and holistic philosophy to capitalization, he has been a thought-partner for many investors as well as private and public management teams. Dr. Secora received his Ph.D. from Princeton University in Applied and Computational Mathematics and B.S. in Mathematics and Physics from Massachusetts Institute of Technology.

Shafique Virani, M.D., has served as our Chief Corporate Development Officer since March 2020. Prior to joining us, he was Chief Executive Officer of Navire Pharma and CoA Therapeutics (each a subsidiary of BridgeBio Pharma, Inc.) from September 2017 to December 2019 and June 2018 to December 2019, respectively. He also served as Chief Executive Officer in Residence of BioBridge LLC from June 2017 to December 2019. Prior to BridgeBio, he assumed a 13-year long tenure at Genentech/Roche from January 2004 to June 2017 as Vice President and Global Head of Neuroscience, ophthalmology and rare disease partnering where he helped build a portfolio of medicines including Risdiplam for spinal muscular atrophy, Enspryng for neuromyelitis optica spectrum disorder and several therapeutics in the mid-late stage clinical pipeline via licensing and acquisitions. Dr. Virani trained as a neurosurgeon in Cambridge, UK and Boston and received his M.D. from the University of Nottingham.

Key Employees

Louisa Daniels, J.D., M.B.A., has served as our Chief Legal Officer and General Counsel since January 2021. Previously, Ms. Daniels was a Vice President and Assistant General Counsel at Pfizer from April 2008 to January 2021, where she also served as Chief Counsel of Global Product Development from May 2016 to January 2021, as Chief Counsel of Global Commercial Operations, Strategy & Portfolio Management from 2013 to 2016, and as Lead Counsel of Pharma Therapeutics R&D from 2008 to 2013. Ms. Daniels obtained her J.D. from the University of California, Berkeley School of Law and her M.B.A from the Paul Merage School of Business at University of California Irvine.

Sharathchandra Hegde, Ph.D., has served as our Chief Scientific Officer since August 2019. Previously, Dr. Hegde spent 19 years from September 1999 to July 2019 at Theravance Biopharma where he was Senior Vice President and Head of Research. Before Theravance, Dr. Hegde spent 9 years at Syntex Corporation, later acquired by Roche Holdings, Ltd. Dr. Hegde obtained his Ph.D. in Pharmacology from the University of Houston and obtained his B.Pharm/M.Pharm degree in Pharmacy/Pharmacology from the University of Mumbai in India. He has participated in the discovery of several new medicines including the marketed medicines Vibativ® (telavancin), Yupelri® (revefenancin), Aloxi® (palonosteron) and others in late stage development including TD-1473 (Phase 2/3 for IBD) and ampreloxetine (Phase 3 for neurogenic orthostatic hypotension). Dr. Hegde has over 30 years of leadership experience in strategic and tactical aspects of drug-discovery and early clinical development. Dr. Hegde has been trained in classical pharmacology and possesses extensive experience in enabling discovery of drugs in multiple therapeutic areas including infectious, cardiovascular, respiratory, genitourinary, gastrointestinal, neurology, fibrosis, oncology, autoimmune and inflammatory diseases.

Heather Kirkby, M.B.A., has served as our Chief People Officer since May 2019. She joined us after 15 years at Intuit, from January 2004 to March 2019, with a background in mechanical engineering, product management and talent development. She creates an exceptional work environment for our team with the mindset of a product manager and the heart of a people leader. Ms. Kirkby has a degree in Mechanical Engineering from Queen’s University and an M.B.A. from Harvard University. Ms. Kirkby began her career running field operations in Arctic Alaska. From there she found her way to led the global product organization for QuickBooks Online Accountant, going on to become Intuit’s global Vice President of Talent Development ushering in a worldwide era of Leader-as-Coach. Her accolades include Intuit’s prestigious CEO Leadership Award and Women Tech Council Award finalist.

Benjamin Mabey, M.S., has served as our Chief Technology Officer since January 2020. He was previously our Vice President of Software Engineering and joined us in March 2017. Mr. Mabey has a

versatile background in computer science, machine learning, software engineering and data science with over 15 years of industry experience. Mr. Mabey worked as a Machine Learning Engineer building automated machine learning systems and solutions in the ad tech, customer service, and healthcare industries. Prior to joining us, Mr. Mabey was a Senior Data Scientist and Team Lead at Savvysherpa, now part of UnitedHealth Group's R&D function, from January 2014 to March 2017, following its acquisition of Red Brain Labs, a Data Science consultancy to Fortune 500 companies, where Mr. Mabey served as Chief Technology Officer from April 2012 to January 2014. Mr. Mabey leads our technology organization, balancing the need for robust scalable systems and continuous innovation.

Mason Victors, M.S., has been our Chief Product Officer since January 2019. Before that he was our Chief Technology Officer from July 2018 to January 2020, after successive promotions beginning as a Senior Data Scientist joining in September 2015. Mr. Victors has a background spanning applied mathematics, data science and machine learning, applying his expertise to complex data science and machine learning problems in domains ranging from telecommunications and e-commerce to healthcare and national security. Prior to joining us, Mr. Victors was a Data Engineer at Red Brain Labs, a Data Science consultancy to Fortune 500 companies, which was acquired by Savvysherpa, now part of UnitedHealth Group's R&D function, having previously worked with technology experts solving data science problems at the National Security Agency. Mr. Victors leads our product organization, identifying what new scientific and technological capabilities we must build to further industrialize drug discovery, ranging from software to biology, automation to chemistry.

Non-employee Directors

Zachary Bogue, J.D., has served as a member of our Board since August 2018. Mr. Bogue brings to bear two decades of experience in Silicon Valley as an entrepreneur, venture capitalist, attorney, and angel investor. Mr. Bogue co-founded DCVC, and he continues to serve as its Co-Managing Partner. Mr. Bogue led DCVC's significant investments in Freenome, Planet Labs, Tala, Oklo and Gro Intelligence. Prior to co-founding DCVC, Mr. Bogue was an entrepreneur, founding three companies in Silicon Valley and an angel investor, with early investments in companies like Square, Inc. and Uber Technologies, Inc. In 2015, the World Economic Forum named Mr. Bogue a Young Global Leader in recognition of his leadership at the intersection of transformative technology and urgent global issues, and he is active in the Davos community. Mr. Bogue graduated with honors from Harvard University in Environmental Science and Public Policy and earned his J.D. with honors from Georgetown Law School. Our Board believes Mr. Bogue is qualified to serve on our Board because of his technical background and his knowledge and perspective of the Company.

Blake Borgeson, Ph.D., a co-founder of the Company, has served as a member of our Board since the company's founding in November 2013, and served as our Chief Technical Officer from November 2013 to July 2018. Dr. Borgeson earned a B.S. in electrical engineering from Rice University. He followed it with a year researching and building real-time navigation software for surgical procedures at the M.E. Mueller Institute in Bern, Switzerland. In 2005, he co-founded an e-commerce company, BuildASign.com. After moving to an advisory role in the business, Dr. Borgeson completed a Ph.D. in bioinformatics at UT Austin in the Marcotte Lab in February 2016, using machine learning to exploit new experimental techniques in rapidly mapping protein complexes. Dr. Borgeson has served on the board of the Machine Intelligence Research Institute in Berkeley since September 2018, which focuses on doing foundational mathematical research to ensure smarter-than-human artificial intelligence has a positive impact. Our Board believes Dr. Borgeson is qualified to serve on our Board because of his technical background and his knowledge and perspective of the Company.

Terry-Ann Burrell, M.B.A., has served as a member of our Board since April 2020. Ms. Burrell, a financial industry veteran, has served as Chief Financial Officer and Treasurer of Beam Therapeutics

since August 2019. Prior to Beam, Ms. Burrell spent 11 years, from May 2008 to August 2019, with J.P. Morgan, most recently as a Managing Director in the healthcare investment banking group from May 2018 to August 2019. There, she had broad coverage across the biotechnology and pharmaceutical industries, helping to execute equity and equity linked financings and M&A transactions. She was instrumental in advising clients on transaction considerations, including strategic rationale, valuation and structuring. Prior to J.P. Morgan, Ms. Burrell worked in equity research at Citigroup, where she covered specialty pharmaceuticals and generics. Ms. Burrell holds an M.B.A. from New York University Leonard N. Stern School of Business and a B.A. in Social Studies from Harvard University. Our Board believes Ms. Burrell is qualified to serve on our Board because of her financial expertise and her senior management experience in the biotechnology industry.

R. Martin Chavez, Ph.D., has served as a member of our Board since April 2020. Dr. Chavez is known for turning the Wall Street trading business into a software business, revolutionizing the way that capital moves and works. From January 2005 to January 2020, he served in a variety of senior roles at Goldman Sachs, including Chief Information Officer, Chief Financial Officer, and global co-head of the firm's Securities Division, and was a member of Goldman's management committee. Previously, Dr. Chavez was Chief Executive Officer and co-founder of Kiodex, acquired by Sungard in 2004, and Chief Technology Officer and co-founder of Quorum Software Systems. Dr. Chavez has served as board member for Paige, an AI-driven biomedical technology startup, since January 2020; as board member for Banco Santander, S.A., since October 2020; as and as board member for Sema4, a precision-genomics testing company, since April 2020. Dr. Chavez has served on the Board of Overseers of Harvard University (President) since September 2020, the Stanford Medicine Board of Fellows since September 2015, and the Board of Trustees of the Institute for Advanced Study since May 2019. He holds an A.B. magna cum laude in Biochemical Sciences and an S.M. in Computer Science from Harvard University, and a Ph.D. in Medical Information Sciences from Stanford University. Our Board believes Dr. Chavez is qualified to serve on our Board because of his scientific and technical background and his knowledge and perspective of the Company.

Zavain Dar has served as a member of our Board since September 2016. Mr. Dar is a Partner at Lux Capital, a tech venture firm since October 2014. At Lux, Mr. Dar invests in companies leveraging machine learning and AI to augment and replace physical-world functions including biology, language, manufacturing and analysis. In addition to leading Lux's investment in Recursion, Mr. Dar has also led Lux's investments in Primer, Thrive Detect (acquired by Exact Sciences), Creyon Bio, LabGenius, Tempo Automation, Braid Health, and CryptoNumerics (acquired by Snowflake). Additionally he is a founding investor in Anagenex Therapeutics and an early angel in Zymergen. Prior, Mr. Dar was a founder and computer scientist. At Discovery Engine (acquired by Twitter) he engineered machine learning and AI systems across a proprietary distributed computing framework to build web scale-ranking algorithms. Mr. Dar was also a cofounder of Fountainhop, a hyper-local social network. Mr. Dar has a B.S. in Symbolic Systems and a M.S. in Theoretical Computer Science from Stanford where he was a researcher in Stanford's AI Lab. Mr. Dar has been a Lecturer at Stanford since January 2014 where he has taught quarter-long seminars on Cryptocurrencies, Artificial Intelligence, and Venture Capital. Our Board believes Mr. Dar is qualified to serve on our Board because of his technical background and his knowledge and perspective of the Company.

Robert Hershberg, M.D., Ph.D., has served as a member of our Board since March 2020. He has been a Venture Partner at Frazier Healthcare Partners since March 2020. Formerly, from April 2017 to March 2020, Dr. Hershberg was the executive vice president and head of business development and global alliances at Celgene (acquired by Bristol-Myers Squibb in 2019). He was employed in positions of ascending responsibility at Celgene since joining the company in 2014, including his role as Chief Scientific Officer from January 2016 to March 2020. Before Celgene, he served several roles at VentiRx Pharmaceuticals, a clinical-stage biopharmaceutical company which he co-founded in 2006 and was Chief Executive Officer from September 2012 until the company's acquisition by Celgene in

February 2017. Dr. Hershberg currently serves on the board of directors of Nanostring Technologies, Inc. (Nasdaq: NSTG), Adaptive Biotechnology (Nasdaq: ADPT), and Silverback Therapeutics (Nasdaq: SBTX). He is a clinical faculty member at the University of Washington School of Medicine, and he holds a Ph.D. in biology from the University of California, San Diego's Affiliated Ph.D. program with the Salk Institute and an M.D. and a B.A. from the University of California, Los Angeles. Our Board believes that Dr. Hershberg is qualified to serve on our Board because of his scientific background, his senior management experience in the pharmaceutical industry, and his knowledge and perspective of the Company.

Dean Y. Li, M.D., Ph.D., a co-founder of the Company, has served as a member of our Board since its founding in November 2013. Dr. Li has served as Executive Vice President and President, Merck Research Laboratories since January 2021. Dr. Li previously served as Senior Vice President of Discovery Sciences and Translational Medicine, Merck Research Laboratories from November 2018 to December 2020. He joined Merck in February 2017 as Vice President and Head of Translational Medicine. Before joining Merck, Dr. Li was conducting medical research at the University of Utah from July 1994 to March 2017. During his time at the university, he cofounded multiple biotech companies stemming from research from his laboratory, including Recursion, Hydra Biosciences and Navigen Pharmaceuticals. Dr. Li served as the H.A. & Edna Benning Professor of Medicine and Cardiology, the vice-dean of research at the University of Utah Health Science Center, and as the chief scientific officer of University of Utah Health Care. Dr. Li also served as interim CEO of Associated Regional University Pathologists, the nation's third-largest clinical reference laboratory, from June 2015 to August 2016. Dr. Li trained at Washington University in Saint Louis before moving to the University of Utah to work as a post-doctoral scientist in the laboratory of Mark Keating. Our Board believes Dr. Li is qualified to serve on our Board because of his scientific background, his senior management experience in the pharmaceutical industry, and his knowledge and perspective of the Company.

Family Relationships

There are no family relationships among any of our executive officers or directors.

Board Composition

Our board of directors currently consists of eight members. After the completion of this offering, the number of directors will be fixed from time to time by our board of directors, subject to the terms of our amended and restated certificate of incorporation and amended and restated bylaws. Each of our current directors will continue to serve as a director until the election and qualification of his or her successor, or until his or her earlier death, resignation, or removal.

Our amended and restated certificate of incorporation will provide that our board of directors will be divided into three classes with staggered three-year terms. Only one class of directors will be elected at each annual meeting of stockholders, with the other classes continuing for the remainder of their respective three-year terms. Our current directors will be divided among the three classes as follows:

- the Class I directors will be , and their terms will expire at the annual meeting of stockholders to be held in 2022;
- the Class II directors will be , and their terms will expire at the annual meeting of stockholders to be held in 2023; and
- the Class III directors will be , and their terms will expire at the annual meeting of stockholders to be held in 2024.

At each annual meeting of stockholders, upon the expiration of the term of a class of directors, the successor to each such director in the class will be elected to serve from the time of election and qualification until the third annual meeting following his or her election and until his or her successor is duly elected and qualified, in accordance with our amended and restated certificate of incorporation. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one third of our directors.

This classification of our board of directors may have the effect of delaying or preventing changes in control of our company.

Director Independence

Upon the completion of this offering, we anticipate that our common stock will be listed on the Nasdaq Global Select Market, or Nasdaq. Under the rules of Nasdaq, independent directors must comprise a majority of a listed company's board of directors within one year of the completion of this offering. In addition, the rules of Nasdaq require that, subject to specified exceptions, each member of a listed company's audit, compensation and corporate governance and nominating committees be independent. Audit committee members and compensation committee members must also satisfy the independence criteria set forth in Rule 10A-3 and Rule 10C-1, respectively, under the Securities Exchange Act of 1934, as amended, or the Exchange Act. Under the rules of Nasdaq, a director will only qualify as an "independent director" if, in the opinion of that company's board of directors, that person does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director.

To be considered to be independent for purposes of Rule 10A-3 and under the rules of Nasdaq, a member of an audit committee of a listed company may not, other than in his or her capacity as a member of the audit committee, the board of directors or any other board committee: (1) accept, directly or indirectly, any consulting, advisory or other compensatory fee from the listed company or any of its subsidiaries or (2) be an affiliated person of the listed company or any of its subsidiaries.

To be considered independent for purposes of Rule 10C-1 and under the rules of Nasdaq, the board of directors must affirmatively determine that each member of the compensation committee is independent, including a consideration of all factors specifically relevant to determining whether the director has a relationship to the company which is material to that director's ability to be independent from management in connection with the duties of a compensation committee member, including: (1) the source of compensation of such director, including any consulting, advisory or other compensatory fee paid by the company to such director and (2) whether such director is affiliated with the company, a subsidiary of the company or an affiliate of a subsidiary of the company.

Our board of directors undertook a review of its composition, the composition of its committees and the independence of our directors and considered whether any director has a material relationship with us that could compromise his or her ability to exercise independent judgment in carrying out his or her responsibilities. Based upon information requested from and provided by each director concerning his or her background, employment and affiliations, including family relationships, our board of directors has determined that Zachary Bogue, Terry-Ann Burrell, R. Martin Chavez, Zavain Dar, Robert Hershberg, and Dean Li, representing six of our eight directors, do not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director and that each of these directors is "independent" as that term is defined under the rules of Nasdaq.

In making these determinations, our board of directors considered the current and prior relationships that each non-employee director has with our company and all other facts and

circumstances our board of directors deemed relevant in determining their independence, including the beneficial ownership of our capital stock by each non-employee director, and the transactions involving them described in the section titled “Certain Relationships and Related Party Transactions.”

Board Leadership Structure

Our board of directors is currently chaired by R. Martin Chavez. As a general policy, our board of directors believes that separation of the positions of Chair of our board of directors and Chief Executive Officer reinforces the independence of our board of directors from management, creates an environment that encourages objective oversight of management’s performance, and enhances the effectiveness of our board of directors as a whole. As such, Dr. Gibson serves as our Chief Executive Officer while Dr. Chavez serves as the Chair of our board of directors but is not an officer. We currently expect and intend the positions of Chair of our board of directors and Chief Executive Officer to continue to be held by two individuals in the future.

Role of the Board in Risk Oversight

Our board of directors has an active role, as a whole and also at the committee level, in overseeing the management of our risks. Our board of directors is responsible for general oversight of risks and regular review of information regarding our risks, including credit risks, liquidity risks, and operational risks. The compensation committee is responsible for overseeing the management of risks relating to our executive compensation plans and arrangements. The audit committee is responsible for overseeing the management of risks relating to accounting matters and financial reporting. The corporate governance and nominating committee is responsible for overseeing the management of risks associated with the independence of our board of directors and potential conflicts of interest. Although each committee is responsible for evaluating certain risks and overseeing the management of such risks, our entire board of directors is regularly informed through discussions from committee members about such risks.

Board Committees

Prior to the completion of this offering, our board of directors will have an audit committee, a compensation committee, a nominating and corporate governance committee, and a social responsibility committee, each of which will have the composition and the responsibilities described below.

Audit Committee

Upon the effectiveness of the registration statement of which this prospectus forms a part, the members of our audit committee will be Zavain Dar, R. Martin Chavez, and Terry-Ann Burrell. will be the chair of our audit committee and is an audit committee financial expert, as that term is defined under the SEC rules implementing Section 407 of the Sarbanes-Oxley Act of 2002, and possesses financial sophistication, as defined under the rules of Nasdaq. Our audit committee will oversee our corporate accounting and financial reporting process and assist our board of directors in monitoring our financial systems. Our audit committee will also:

- select, retain, compensate, evaluate, oversee, and where appropriate, terminate the independent registered public accounting firm to audit our financial statements;
- help to ensure the independence and performance of the independent registered public accounting firm;

- approve audit and non-audit services and fees;
- review financial statements and discuss with management and the independent registered public accounting firm our annual audited and quarterly financial statements, the results of the independent audit and the quarterly reviews and the reports and certifications regarding internal controls over financial reporting and disclosure controls;
- prepare the audit committee report that the SEC requires to be included in our annual proxy statement;
- review reports and communications from the independent registered public accounting firm;
- review the adequacy and effectiveness of our internal controls and disclosure controls and procedure;
- review our policies on risk assessment and risk management;
- review and monitor conflicts of interest situations, and approve or prohibit any involvement in matters that may involve a conflict of interest or taking of a corporate opportunity;
- review the overall adequacy and effectiveness of our legal, regulatory, and ethical compliance programs and reports regarding compliance with applicable laws, regulations, and internal compliance programs;
- review related party transactions; and
- establish and oversee procedures for the receipt, retention, and treatment of accounting related complaints and the confidential submission by our employees of concerns regarding questionable accounting or auditing matters.

Our audit committee will operate under a written charter, to be effective upon the effectiveness of the registration statement of which this prospectus forms a part, which will satisfy the applicable rules of the SEC and the listing standards of Nasdaq.

Compensation Committee

Upon the effectiveness of the registration statement of which this prospectus forms a part, the members of our compensation committee will be Zachary Bogue, Dean Li, and Robert Hershberg. will be the chair of our compensation committee. Our compensation committee will oversee our compensation policies, plans and benefits programs. The compensation committee will also:

- oversee our overall compensation philosophy and compensation policies, plans, and benefit programs;
- review and recommend for approval to the Board of Directors compensation for our executive officers and directors;
- prepare the compensation committee report that the SEC will require to be included in our annual proxy statement; and
- administer our equity compensation plans.

Our compensation committee will operate under a written charter, to be effective upon the effectiveness of the registration statement of which this prospectus forms a part, which will satisfy the applicable rules of the SEC and the listing standards of Nasdaq.

Nominating and Corporate Governance Committee

Upon the effectiveness of the registration statement of which this prospectus forms a part, the members of our nominating and corporate governance committee will be Zavain Dar, Dean Li, and

Blake Borgeson. will be the chair of our nominating and corporate governance committee. Our nominating and corporate governance committee will oversee and assist our board of directors in reviewing and recommending nominees for election as directors. Specifically, the nominating and corporate governance committee will:

- identify, evaluate and make recommendations to our board of directors regarding nominees for election to our board of directors and its committees;
- consider and make recommendations to our board of directors regarding the composition of our board of directors and its committees;
- review developments in corporate governance practices;
- evaluate the adequacy of our corporate governance practices and reporting; and
- evaluate the performance of our board of directors and of individual directors.

Our nominating and corporate governance committee will operate under a written charter, to be effective upon the effectiveness of the registration statement of which this prospectus forms a part, which will satisfy the applicable rules of the SEC and the listing standards of Nasdaq.

Social Responsibility Committee

Upon the effectiveness of the registration statement of which this prospectus forms a part, the members of our social responsibility committee will be Zavain Dar, Terry-Ann Burrell, Christopher Gibson, Blake Borgeson, and Zachary Bogue. Christopher Gibson will be the chair of our social responsibility committee. Our social responsibility committee will oversee and assist our board of directors in . Specifically, the social responsibility committee will:

- .

Our social responsibility committee will operate under a written charter, to be effective upon the effectiveness of the registration statement of which this prospectus forms a part.

Director Compensation

Prior to this offering, we have not implemented a formal policy with respect to compensation payable to our non-employee directors. From time to time, we have granted equity awards to attract them to join our board of directors and for their continued service on our board of directors. We did not pay any compensation, other than equity awards, to any of our non-employee directors in 2020. We reimburse our directors for expenses associated with attending meetings of our board of directors and its committees.

In connection with this offering, we intend to adopt and ask our stockholders to approve the initial terms of our non-employee director compensation program. Our board of directors is still in the process of considering the non-employee director compensation policy.

Dr. Gibson was our only employee who served as a director during 2020. See the section titled "Executive Compensation" for information about Dr. Gibson's compensation, which includes compensation Dr. Gibson received for serving as our Chief Executive Officer during 2020. The following table provides information regarding compensation of our non-employee directors for the year ended December 31, 2020:

Name	Option Awards ($)[1]	Total ($)
Zachary Bogue, J.D.	$ —	$ —
Blake Borgeson, Ph.D.	$ —	$ —
Terry-Ann Burrell	$ 1,064,266	$ 1,064,266
R. Martin Chavez, Ph.D.	$ 1,063,800	$ 1,063,800
Zavain Dar	$ —	$ —
Robert Hershberg, M.D., Ph.D.	$ 1,064,584	$ 1,064,584
Dean Li, M.D.	$ —	$ —

(1) In accordance with SEC rules, the amount in this column reflects the aggregate grant date fair value of stock options granted during 2020 computed in accordance with Accounting Standards Codification, or ASC, Topic 718, rather than the amount paid or realized by the director. We provide information regarding the assumptions used to calculate the value of all stock options granted to our directors in Note to our audited financial statements included elsewhere in this prospectus.

Compensation Committee Interlocks and Inside Participation

None of the members of our board of directors who will serve on our compensation committee upon the effectiveness of the registration statement of which this prospectus forms a part is or has been an officer or employee of our company. None of our executive officers currently serves, or in the past fiscal year has served, as a member of the board of directors or compensation committee (or other board committee performing equivalent functions or, in the absence of any such committee, the entire board of directors) of any entity that has one or more executive officers serving on our board of directors or compensation committee.

Code of Business Conduct and Ethics

Prior to the effectiveness of the registration statement of which this prospectus forms a part, we intend to adopt a written code of business conduct and ethics that will apply to our directors, officers, and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. Following this offering, the code of business conduct and ethics will be available on our website at www.recursionpharma.com. We intend to disclose future amendments to such code, or any waivers of its requirements, applicable to any principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions or our directors on our website identified above or in a current report on Form 8-K. Information contained on the website is not incorporated by reference into this prospectus and should not be considered to be part of this prospectus. The inclusion of our website address in this prospectus is an inactive textual reference only.

Executive Compensation

Our named executive officers for 2020, which consist of each person who served as our principal executive officer during 2020 and our next four most highly compensated executive officers during 2020 are:

- Christopher Gibson, our Chief Executive Officer and Director
- Ramona Doyle, our Chief Medical Officer
- Tina Marriott Larson, our Chief Operating Officer and President
- Michael Secora, our Chief Financial Officer
- Shafique Virani, our Chief Corporate Development Officer

Summary Compensation Table

The following table sets forth information regarding the compensation of our named executive officers for the year ended December 31, 2020.

Name and Principal Position	Year	Salary ($)	Option Awards ($)(1)	Non-Equity Incentive Plan Compensation ($)(2)	All Other Compensation ($)	Total ($)
Christopher Gibson, Chief Executive Officer	2020	266,864	2,268,661		25,700(3)	(4)
Ramona Doyle, Chief Medical Officer(5)	2020	2,192	1,134,331		—	(4)
Tina Marriott Larson, Chief Operating Officer and President	2020	401,500	226,866		25,700(3)	(4)
Michael Secora, Chief Financial Officer	2020	170,833	(6)		100,500(7)	(4)
Shafique Virani, Chief Corporate Development Officer(5)	2020	416,667	991,749		33,526(8)	(4)

(1) In accordance with SEC rules, the amount in this column reflects the aggregate grant date fair value of stock options granted during 2020 computed in accordance with Accounting Standards Codification, or ASC, Topic 718, rather than the amount paid or realized by the director. We provide information regarding the assumptions used to calculate the value of all stock options granted to our directors in Note to our audited financial statements included elsewhere in this prospectus. For the Performance Option (as described below), we calculated the grant date fair value based on multiple liquidity event value paths developed through the use of a Monte Carlo simulation. The assumptions used in calculating the grant-date fair value of the Performance Option reported in this column are set forth in Note to our consolidated financial statements appearing at the end of this prospectus. See "Narrative Disclosure to Summary Compensation Table—*2020 CFO Options*" for additional information.

(2) The earned amounts under the 2020 bonus plan have not yet been determined. Any amounts determined to be payable to our named executive officers under the 2020 bonus plan will be disclosed in an amendment to this filing. Our 2020 bonus plan is more fully described below under the section titled "*—Non-Equity Incentive Plan Compensation*."

(3) Amount consists of $12,700 in matching contributions to our 401(k) plan and a $13,000 COVID life assistance bonus.

(4) Because the cash bonuses earned under our 2020 bonus plan have not yet been determined, total 2020 compensation will be disclosed once such bonuses have been determined in an amendment to this filing.

(5) The named executive officer's base salary was pro-rated for the number of days such named executive officer worked for us in 2020.

(6) Because the fair value of Mr. Secora's option awards has not yet been determined, such amount will be disclosed in an amendment to this filing. See "Narrative Disclosure to Summary Compensation Table—*2020 CFO Options*" for additional information.

(7) Amount consists of a $50,000 relocation bonus, $12,700 in matching contributions to our 401(k) plan, $24,800 in contributions to a supplemental retirement plan, and a $13,000 COVID life assistance bonus.
(8) Amount consists of $12,900 in matching contributions to our 401(k) plan, a $13,000 COVID life assistance bonus, and $7,623 in travel and housing reimbursement.

Narrative Disclosure to Summary Compensation Table

Non-Equity Incentive Plan Compensation

At the beginning of 2020, we adopted a bonus plan for our executive and non-executive employees that provides for cash incentives for performance in the year. The 2020 bonus opportunities for our executives is based on the assessment of our board of directors of the achievement of company objectives that were established by our board of directors at the beginning of the year. The company objectives for 2020 consisted of milestones related to expanding the capabilities and breadth of the Recursion OS and the Recursion Map, developing our drug candidates and bolstering employee engagement and development. A single company-wide performance multiplier is applied to the maximum potential bonus of 10% of salary for each employee.

Our board of directors has not yet made a determination of the company's achievement of its objectives for 2020.

The amounts to be included in the Summary Compensation Table under the column "Non-Equity Incentive Plan Compensation" will be based on 10% of the named executive officer's 2020 salary multiplied by the performance multiplier determined by our board of directors (and further pro-rated based on the period of time during which such named executive officer was employed with us during the year).

2020 CFO Options

In March 2020, our board of directors granted Mr. Secora the following options to purchase shares of our common stock:

- an option to purchase 750,000 shares, or the Initial Option;
- an option to purchase 50,000 shares, or the Sign-on Option; and
- an option to purchase 1,000,000 shares, or the Performance Incentive Option.

These grants were negotiated in connection with the hiring of Mr. Secora in February 2020, and were set at levels that were designed to recruit him to our company and provide incentives with us to remain over the long-term.

The Initial Option vests as to 1/48th of the shares subject to the Initial Option each month after the first day of Mr. Secora's employment with us, subject to Mr. Secora's continued service through the relevant vesting dates.

The Sign-on Option vested as to 100% of the shares subject to the Sign-on Option on the later of i) the first day of Mr. Secora's employment with us or ii) the date Mr. Secora permanently relocates to the Salt Lake City, Utah area on a full-time basis, subject to his continued service through such later date.

The Performance Incentive Option becomes cumulatively vested as to the following number of shares subject to the Performance Incentive Option upon each occurrence of certain liquidity events, subject to Mr. Secora's continued service through the date of such Liquidity Event:

Liquidity Event Value	Cumulative Vested Shares
Greater than $10.67	100,000
Greater than $13.87	200,000
Greater than $18.04	300,000
Greater than $23.45	400,000
Greater than $30.48	500,000
Greater than $44.20	600,000
Greater than $64.09	700,000
Greater than $92.93	800,000
Greater than $134.75	900,000
Greater than $195.39	1,000,000

Once a number of shares subject to the Performance Incentive Option have vested upon the occurrence of a liquidity event, the number of vested shares subject to the Performance Incentive Option will not be reduced if the Liquidity Event Value in a subsequent liquidity event is lower than the Liquidity Event Value in the prior liquidity event.

If liquidity event is	Then
our entering into a term sheet, letter of intent, or similar agreement for a financing (whereby equity securities (or securities convertible or exchangeable into equity securities) of ours or any of our subsidiaries are sold and issued to independent third parties primarily for capital raising purposes) that is approved by our board of directors	the amount to be payable for each share of our capital stock in connection with the financing, as set forth in the term sheet
our entering into a term sheet, letter of intent, or similar agreement for a change in control that is approved by our board of directors, the greater of (x) the amount to be payable for each share of our common stock in connection with the change in control, as set forth in, or determinable under the terms of, the term sheet or (y) if such change in control is actually consummated	the actual amount payable for each share of our common stock in connection with the change in control (with any amount that is subject to an escrow, earn-out, holdback or other similar arrangement not included in the Liquidity Event Value unless and until such amount is actually paid)
an underwritten public offering of our common equity securities, including the offering under which this prospectus forms a part.	the initial price to the public as set forth in the final prospectus included within the registration statement in Form S-1 filed with the Securities and Exchange Commission for such underwritten public offering
the first sale or resale of our common equity securities to the general public in connection with a direct listing	the reference price set by the applicable stock exchange or national market system
a Measurement Date*	the closing sales price for a share of our common stock on such Measurement Date as quoted on the applicable stock exchange or national market system
Significant Financial Event**	the amount to be payable for each share of our capital stock in connection with the applicable Significant Financial Event

* "Measurement Date" is each trading day that our common stock is listed on any established stock exchange or a national market system.

** "Significant Financial Event" means the occurrence of any of the following events while our common stock is listed on any established stock exchange or a national market system: i) a repurchase of shares of our common stock pursuant to a tender offer, ii) a private investment in public equity transaction whereby we sell publicly traded shares of our common stock, preferred stock, and/or convertible securities to private investors, or iii) an accelerated share repurchase by us to buy back large blocks of outstanding shares of our common stock quickly to maintain a certain valuation, using an investment bank as an intermediary.

We estimated the grant date fair value of the Performance Incentive Option using a model based on multiple stock price paths developed through the use of a Monte Carlo simulation that incorporates into the valuation the possibility that the Liquidity Event Value targets may not be satisfied. The average grant date fair value of the Performance Incentive Option was estimated to be $1.06 per

share, and we will recognize total stock-based compensation expense of approximately $1,060,000 over the derived service period. If the Liquidity Event Value targets are met sooner than the derived service period, we will adjust our stock-based compensation expense to reflect the cumulative expense associated with the vested award. We will recognize stock-based compensation expense if service provided by Mr. Secora over the requisite service period, regardless of whether the Liquidity Event Value Targets are achieved.

Outstanding Equity Awards at Fiscal Year-End

The following table sets forth information concerning outstanding equity awards held by each of our named executive officers as of December 31, 2020:

	Option Awards				
Name	Grant Date[1]	Number of Securities Underlying Unexercised Options Exercisable (#)	Number of Securities Underlying Unexercised Options Unexercisable (#)	Option Exercise Price ($)[2]	Option Expiration Date
Christopher Gibson	2020		1,000,000[3]	$ 3.71	12/30/2030
Ramona Doyle	2020		500,000[4]	$ 3.71	12/30/2030
Tina Marriott Larson	2018	308,125	201,875[5]	$ 1.59	7/22/2028
Tina Marriott Larson	2020		100,000[6]	$ 3.71	12/30/2030
Michael Secora	2020	140,625	609,375[7]	$ 3.33	3/03/2030
Michael Secora	2020		1,000,000[8]	$ 3.33	3/03/2030
Michael Secora	2020	50,000		$ 3.33	3/03/2030
Shafique Virani	2020	93,750	406,250[9]	$ 3.33	3/03/2030

(1) Each of the outstanding equity awards was granted pursuant to our 2016 Plan.
(2) This column represents the fair market value of a share of our common stock on the date of grant, as determined by our board of directors.
(3) One forty-eighth (1/48th) of the shares subject to the award shall vest one month after December 31, 2020, or the Gibson Vesting Commencement Date, and one forty-eighth (1/48th) of the shares subject to the award shall vest each month thereafter on the same day of the month as the Gibson Vesting Commencement Date.
(4) Twenty-Five percent (25%) of the shares subject to the award shall vest one year after December 31, 2020, or the Doyle Annual Vesting Commencement Date, and one-forty-eighth (1/48th) of the shares subject to the award shall vest each month thereafter on the same day of the month as the Doyle Annual Vesting Commencement Date.
(5) Twenty-Five percent (25%) of the shares subject to the award shall vest one year after July 16, 2018, or the Larson Annual Vesting Commencement Date, and one-forty-eighth (148th) of the shares subject to the award shall vest each month thereafter on the same day of the month as the Larson Annual Vesting Commencement Date.
(6) One forty-eighth (1/48th) of the shares subject to the award shall vest one month after December 31, 2020, or the Larson Monthly Vesting Commencement Date, and one forty-eighth (1/48th) of the shares subject to the award shall vest each month thereafter on the same day of the month as the Larson Monthly Vesting Commencement Date.
(7) One forty-eighth (1/48th) of the shares subject to the award shall vest one month after March 1, 2020, or the Secora Vesting Commencement Date, and one forty-eighth (1/48th) of the shares subject to the award shall vest each month thereafter on the same day of the month as the Secora Vesting Commencement Date.
(8) See the section titled “2020 CFO Options” for a description of the terms of the award.
(9) One forty-eighth (1/48th) of the shares subject to the award shall vest one month after March 4, 2020, or the Virani Vesting Commencement Date, and one forty-eighth (1/48th) of the shares subject to the award shall vest each month thereafter on the same day of the month as the Virani Vesting Commencement Date.

Employment Arrangements With Our Named Executive Officers

We have entered into an employment agreement with each of our named executive officers in connection with his employment with us.

Christopher Gibson

We currently expect that, prior to the completion of this offering, we will enter into a confirmatory employment agreement with Dr. Gibson, our Chief Executive Officer. The confirmatory employment agreement currently is expected to have no specific term and will provide for at-will employment. Dr. Gibson's current annual base salary is $450,000, and Dr. Gibson's annual target bonus is 10% of his annual base salary.

Ramona Doyle

We currently expect that, prior to the completion of this offering, we will enter into a confirmatory employment agreement with Dr. Doyle, our Chief Medical Officer. The confirmatory employment agreement currently is expected to have no specific term and will provide for at-will employment. Dr. Doyle's current annual base salary is $440,000, and Dr. Doyle's annual target bonus is 10% of her annual base salary.

Tina Marriott Larson

We currently expect that, prior to the completion of this offering, we will enter into a confirmatory employment agreement with Ms. Larson, our President and Chief Operating Officer. The confirmatory employment agreement currently is expected to have no specific term and will provide for at-will employment. Ms. Larson's current annual base salary is $401,500, and Ms. Larson's annual target bonus is 10% of her annual base salary.

Michael Secora

We currently expect that, prior to the completion of this offering, we will enter into a confirmatory employment agreement with Mr. Secora, our Chief Financial Officer. The confirmatory employment agreement currently is expected to have no specific term and will provide for at-will employment. Mr. Secora's current annual base salary is $205,000, and Mr. Secora's annual target bonus is 10% of his annual base salary.

Shafique Virani

We currently expect that, prior to the completion of this offering, we will enter into a confirmatory employment agreement with Mr. Virani, our Chief Corporate Development Officer. The confirmatory employment agreement currently is expected to have no specific term and will provide for at-will employment. Mr. Virani's current annual base salary is $500,000, and Mr. Virani's annual target bonus is 10% of his annual base salary.

Potential Payments Upon Termination or Change In Control

We currently expect that, prior to the completion of this offering, we will adopt arrangements for our executive officers that provide for payments and benefits on termination or change of control, which arrangements may be included in the anticipated confirmatory employment agreements or separate plans or agreements.

Employee Benefit and Stock Plans

2021 Equity Incentive Plan

Prior to the effectiveness of this offering, we expect that our board of directors will adopt, and our stockholders will approve, our 2021 Equity Incentive Plan, or the 2021 Plan. The 2021 Plan will be

effective on the business day immediately prior to the effective date of the registration statement of which this prospectus forms a part. Our 2021 Plan will provide for the grant of incentive stock options, within the meaning of Section 422 of the Code, to our employees and any of our parent and subsidiary corporations' employees, and for the grant of nonstatutory stock options, restricted stock, restricted stock units, stock appreciation rights, performance units, and performance shares to our employees, directors, and consultants and our subsidiary corporations' employees and consultants.

Authorized shares. A total of shares of our common stock are reserved for issuance pursuant to our 2021 Plan. In addition, the shares reserved for issuance under our 2021 Plan will also include (1) those shares reserved but unissued under our 2016 Plan as of the date of stockholder approval of the 2021 Plan and (2) shares of our common stock subject to or issued pursuant to awards granted under our 2016 Plan that, after the date of stockholder approval of the 2021 Plan, expire or otherwise terminate without having been exercised in full or are forfeited to or repurchased by us due to failure to vest (provided that the maximum number of shares that may be added to the 2021 Plan pursuant to (1) and (2) is shares). The number of shares available for issuance under our 2021 Plan will also include an annual increase on the first day of each fiscal year beginning with our 2022 fiscal year, equal to the least of:

- shares;
- percent (%) of the outstanding shares of our common stock as of the last day of the immediately preceding fiscal year; or
- such other amount as our board of directors may determine.

If an award expires or becomes unexercisable without having been exercised in full, is surrendered pursuant to an exchange program, or, with respect to restricted stock, restricted stock units, performance units or performance shares, is forfeited to or repurchased by us due to failure to vest, the unpurchased shares (or for awards other than stock options or stock appreciation rights, the forfeited or repurchased shares) will become available for future grant or sale under the 2021 Plan (unless the 2021 Plan has terminated). With respect to stock appreciation rights, only the net shares actually issued will cease to be available under the 2021 Plan and all remaining shares under stock appreciation rights will remain available for future grant or sale under the 2021 Plan (unless the 2021 Plan has terminated). Shares that have actually been issued under the 2021 Plan will not be returned to the 2021 Plan except if shares issued pursuant to awards of restricted stock, restricted stock units, performance shares, or performance units are repurchased by or forfeited to us due to failure to vest, such shares will become available for future grant under the 2021 Plan. Shares used to pay the exercise price of an award or satisfy the tax withholding obligations related to an award will become available for future grant or sale under the 2021 Plan. To the extent an award is paid out in cash rather than shares, such cash payment will not result in a reduction in the number of shares available for issuance under the 2021 Plan.

Plan administration. Our board of directors or one or more committees appointed by our board of directors will administer our 2021 Plan. The compensation committee of our board of directors will initially administer our 2021 Plan. In addition, if we determine it is desirable to qualify transactions under our 2021 Plan as exempt under Rule 16b-3 of the Exchange Act, such transactions will be structured to satisfy the requirements for exemption under Rule 16b-3. Subject to the provisions of our 2021 Plan, the administrator has the power to administer our 2021 Plan and make all determinations deemed necessary or advisable for administering the 2021 Plan, including but not limited to, the power to determine the fair market value of our common stock, select the service providers to whom awards may be granted, determine the number of shares covered by each award, approve forms of award agreements for use under the 2021 Plan, determine the terms and conditions of awards (including, but not limited to, the exercise price, the time or times at which awards may be exercised, any vesting

acceleration or waiver or forfeiture restrictions and any restriction or limitation regarding any award or the shares relating thereto), construe and interpret the terms of our 2021 Plan and awards granted under it, prescribe, amend and rescind rules relating to our 2021 Plan, including creating sub-plans, modify or amend each award, including but not limited to the discretionary authority to extend the post-termination exercisability period of awards (except no option or stock appreciation right will be extended past its original maximum term), and allow a participant to defer the receipt of payment of cash or the delivery of shares that would otherwise be due to such participant under an award. The administrator also has the authority to allow participants the opportunity to transfer outstanding awards to a financial institution or other person or entity selected by the administrator and to institute an exchange program by which outstanding awards may be surrendered or cancelled in exchange for awards of the same type, which may have a higher or lower exercise price and/or different terms, awards of a different type, and/or cash or by which the exercise price of an outstanding award is increased or reduced. The administrator's decisions, interpretations, and other actions are final and binding on all participants.

Stock options. Stock options may be granted under our 2021 Plan. The exercise price of options granted under our 2021 Plan must at least be equal to the fair market value of our common stock on the date of grant. The term of an option may not exceed ten years. With respect to any participant who owns more than 10% of the voting power of all classes of our (or any parent or subsidiary of ours) outstanding stock, the term of an incentive stock option granted to such participant must not exceed five years and the exercise price must equal at least 110% of the fair market value on the grant date. The administrator will determine the methods of payment of the exercise price of an option, which may include cash, shares or other property acceptable to the administrator, as well as other types of consideration permitted by applicable law. After the termination of service of an employee, director, or consultant, he or she may exercise his or her option for the period of time stated in his or her option agreement. In the absence of a specified time in an award agreement, if termination is due to death or disability, the option will remain exercisable for 12 months following the termination of service. In all other cases, in the absence of a specified time in an award agreement, the option will remain exercisable for three months following the termination of service. An option, however, may not be exercised later than the expiration of its term. Subject to the provisions of our 2021 Plan, the administrator determines the other terms of options.

Stock appreciation rights. Stock appreciation rights may be granted under our 2021 Plan. Stock appreciation rights allow the recipient to receive the appreciation in the fair market value of our common stock between the exercise date and the date of grant. Stock appreciation rights may not have a term exceeding ten years. After the termination of service of an employee, director, or consultant, he or she may exercise his or her stock appreciation right for the period of time stated in his or her stock appreciation rights agreement. In the absence of a specified time in an award agreement, if termination is due to death or disability, the stock appreciation rights will remain exercisable for 12 months following the termination of service. In all other cases, in the absence of a specified time in an award agreement, the stock appreciation rights will remain exercisable for three months following the termination of service. However, in no event may a stock appreciation right be exercised later than the expiration of its term. Subject to the provisions of our 2021 Plan, the administrator determines the other terms of stock appreciation rights, including when such rights become exercisable and whether to pay any increased appreciation in cash or with shares of our common stock, or a combination thereof, except that the per share exercise price for the shares to be issued pursuant to the exercise of a stock appreciation right will be no less than 100% of the fair market value per share on the date of grant.

Restricted stock. Restricted stock may be granted under our 2021 Plan. Restricted stock awards are grants of shares of our common stock that vest in accordance with terms and conditions established by the administrator. The administrator will determine the number of shares of restricted stock granted to any employee, director, or consultant and, subject to the provisions of our 2021 Plan,

will determine the terms and conditions of such awards. The administrator may impose whatever vesting conditions it determines to be appropriate (for example, the administrator may set restrictions based on the achievement of specific performance goals or continued service to us), except the administrator, in its sole discretion, may accelerate the time at which any restrictions will lapse or be removed. Recipients of restricted stock awards generally will have voting and dividend rights with respect to such shares upon grant without regard to vesting, unless the administrator provides otherwise. Shares of restricted stock that do not vest are subject to our right of repurchase or forfeiture.

Restricted stock units. Restricted stock units may be granted under our 2021 Plan. Restricted stock units are bookkeeping entries representing an amount equal to the fair market value of one share of our common stock. Subject to the provisions of our 2021 Plan, the administrator determines the terms and conditions of RSUs, including the vesting criteria and the form and timing of payment. The administrator may set vesting criteria based upon the achievement of company-wide, divisional, business unit or individual goals (including, but not limited to, continued employment or service), applicable federal or state securities laws or any other basis determined by the administrator in its discretion. The administrator, in its sole discretion, may pay earned restricted stock units in the form of cash, in shares or in some combination thereof. In addition, the administrator, in its sole discretion, may accelerate the time at which any restrictions will lapse or be removed.

Performance units and performance shares. Performance units and performance shares may be granted under our 2021 Plan. Performance units and performance shares are awards that will result in a payment to a participant only if performance objectives established by the administrator are achieved or the awards otherwise vest. The administrator will establish performance objectives or other vesting criteria in its discretion, which, depending on the extent to which they are met, will determine the number or the value of performance units and performance shares to be paid out to participants. The administrator may set performance objectives based on the achievement of company-wide, divisional, business unit, or individual goals (including, but not limited to, continued employment or service), applicable federal or state securities laws or any other basis determined by the administrator in its discretion. After the grant of a performance unit or performance share, the administrator, in its sole discretion, may reduce or waive any performance objectives or other vesting provisions for such performance units or performance shares. Performance units will have an initial value established by the administrator on or prior to the grant date. Performance shares will have an initial value equal to the fair market value of our common stock on the grant date. The administrator, in its sole discretion, may pay out earned performance units or performance shares in cash, shares, or in some combination thereof.

Outside directors. All outside (non-employee) directors will be eligible to receive all types of awards (except for incentive stock options) under our 2021 Plan. To provide a maximum limit on the cash compensation and equity awards that can be made to our outside directors, our 2021 Plan provides that in any given fiscal year, an outside director will not be granted cash compensation and equity awards with an aggregate value greater than $, with the value of each equity award based on its grant date fair value as determined according to GAAP for purposes of this limit. Any cash compensation paid or awards granted to an individual for his or her services as an employee or consultant (other than as an outside director) will not count toward this limit.

Non-transferability of awards. Unless the administrator provides otherwise, our 2021 Plan generally does not allow for the transfer of awards and only the recipient of an award may exercise an award during his or her lifetime. If the administrator makes an award transferrable, such award will contain such additional terms and conditions as the administrator deems appropriate.

Certain adjustments. In the event of certain changes in our capitalization, to prevent diminution or enlargement of the benefits or potential benefits available under our 2021 Plan, the administrator will

adjust the number and class of shares that may be delivered under our 2021 Plan and/or the number, class, and price of shares covered by each outstanding award and the numerical share limits set forth in our 2021 Plan.

Dissolution or liquidation. In the event of our proposed liquidation or dissolution, the administrator will notify participants as soon as practicable and, to the extent not exercised, all awards will terminate immediately prior to the consummation of such proposed transaction.

Merger or change in control. Our 2021 Plan provides that in the event of a merger or change in control, as defined under our 2021 Plan, each outstanding award will be treated as the administrator determines, without a participant's consent. The administrator is not required to treat all awards, all awards held by a participant or all awards of the same type similarly.

If a successor corporation does not assume or substitute for any outstanding award, then the participant will fully vest in and have the right to exercise all of his or her outstanding options and stock appreciation rights, all restrictions on restricted stock and restricted stock units will lapse, and for awards with performance-based vesting, unless specifically provided for otherwise under the applicable award agreement or other agreement or policy applicable to the participant, all performance goals or other vesting criteria will be deemed achieved at 100% of target levels and all other terms and conditions met. If an option or stock appreciation right is not assumed or substituted in the event of a change in control, the administrator will notify the participant in writing or electronically that such option or stock appreciation right will be exercisable for a period of time determined by the administrator in its sole discretion and the option or stock appreciation right will terminate upon the expiration of such period.

For awards granted to an outside director, in the event of a change in control, the outside director will fully vest in and have the right to exercise all of his or her outstanding options and stock appreciation rights, all restrictions on restricted stock and restricted stock units will lapse and, for awards with performance-based vesting, unless specifically provided for otherwise under the applicable award agreement or other agreement or policy applicable to the participant, all performance goals or other vesting criteria will be deemed achieved at 100% of target levels and all other terms and conditions met.

Clawback. Awards will be subject to any clawback policy of ours, and the administrator also may specify in an award agreement that the participant's rights, payments, and/or benefits with respect to an award will be subject to reduction, cancellation, forfeiture, and/or recoupment upon the occurrence of certain specified events. Our board of directors may require a participant to forfeit, return, or reimburse us all or a portion of the award and/or shares issued under the award, any amounts paid under the award, and any payments or proceeds paid or provided upon disposition of the shares issued under the award in order to comply with such clawback policy or applicable laws.

Amendment; termination. The administrator has the authority to amend, alter, suspend or terminate our 2021 Plan, provided such action does not materially impair the rights of any participant. Our 2021 Plan automatically will terminate in 2031, unless we terminate it sooner.

2021 Employee Stock Purchase Plan

Prior to the effectiveness of this offering, we expect that our board of directors will adopt, and our stockholders will approve, our 2021 Employee Stock Purchase Plan, or 2021 ESPP. We expect that our 2021 ESPP will be effective on the business day immediately prior to the effective date of the registration statement of which this prospectus forms a part. However, no offering period or purchase period under the 2021 ESPP will begin unless and until otherwise determined by our board of directors.

Authorized shares. A total of shares of our common stock will be available for sale under our 2021 ESPP. The number of shares of our common stock that will be available for sale under our 2021 ESPP also includes an annual increase on the first day of each fiscal year following the fiscal year in which the first offering period under the 2021 ESPP commences, equal to the least of:

- shares;
- percent (%) of the outstanding shares of our common stock as of the last day of the immediately preceding fiscal year; or
- such other amount as the administrator may determine.

2021 ESPP administration. We expect that the compensation committee of our board of directors will administer our 2021 ESPP and will have full and exclusive discretionary authority to construe, interpret, and apply the terms of the 2021 ESPP, delegate ministerial duties to any of our employees, designate separate offerings under the 2021 ESPP, designate our subsidiaries and affiliates as participating in the 2021 ESPP, determine eligibility, adjudicate all disputed claims filed under the 2021 ESPP, and establish procedures that it deems necessary for the administration of the 2021 ESPP, including, but not limited to, adopting such procedures and sub-plans as are necessary or appropriate to permit participation in the 2021 ESPP by employees who are foreign nationals or employed outside the United States. The administrator's findings, decisions and determinations are final and binding on all participants to the full extent permitted by law.

Eligibility. Generally, all of our employees will be eligible to participate if they are customarily employed by us, or any participating subsidiary or affiliate, for at least 20 hours per week and more than five months in any calendar year. The administrator, in its discretion, may, prior to an enrollment date, for all options to be granted on such enrollment date in an offering, determine that an employee who (1) has not completed at least two years of service (or a lesser period of time determined by the administrator) since his or her last hire date, (2) customarily works not more than 20 hours per week (or a lesser period of time determined by the administrator), (3) customarily works not more than five months per calendar year (or a lesser period of time determined by the administrator), (4) is a highly compensated employee within the meaning of Section 414(q) of the Code, or (5) is a highly compensated employee within the meaning of Section 414(q) of the Code with compensation above a certain level or is an officer or subject to disclosure requirements under Section 16(a) of the Exchange Act, is or is not eligible to participate in such offering period.

However, an employee may not be granted rights to purchase shares of our common stock under our 2021 ESPP if such employee:

- immediately after the grant would own capital stock and/or hold outstanding options to purchase such stock possessing 5% or more of the total combined voting power or value of all classes of capital stock of ours or of any parent or subsidiary of ours; or
- holds rights to purchase shares of our common stock under all employee stock purchase plans of ours or any parent or subsidiary of ours that accrue at a rate that exceeds $25,000 worth of shares of our common stock for each calendar year in which such rights are outstanding at any time.

Offering periods. Our 2021 ESPP will include a component that allows us to make offerings intended to qualify under Section 423 of the Code and a component that allows us to make offerings not intended to qualify under Section 423 of the Code to designated companies, as described in our 2021 ESPP. No offering is expected to be authorized to date by our board of directors under the 2021 ESPP prior to the completion of this offering. If our board of directors authorizes an offering period under the 2021 ESPP, our board of directors is authorized to establish the duration of offering periods and purchase periods, including the starting and ending dates of offering periods and purchase periods, provided that no offering period may have a duration exceeding 27 months.

Contributions. Our 2021 ESPP will permit participants to purchase shares of our common stock through contributions (in the form of payroll deductions or otherwise to the extent permitted by the administrator) of up to % of their eligible compensation. A participant may purchase a maximum of shares of our common stock during a purchase period.

Exercise of purchase right. If our board of directors authorizes an offering and purchase period under the 2021 ESPP, amounts contributed and accumulated by the participant during any offering period will be used to purchase shares of our common stock at the end of each purchase period. The purchase price of the shares will be % of the lower of the fair market value of our common stock on the first trading day of the offering period or on the exercise date. Participants may end their participation at any time during an offering period and will be paid their accrued contributions that have not yet been used to purchase shares of our common stock. Participation ends automatically upon termination of employment with us.

Non-transferability. A participant may not transfer rights granted under our 2021 ESPP (other than by will, the laws of descent and distribution or as otherwise provided under our 2021 ESPP).

Merger or change in control. Our 2021 ESPP will provide that in the event of a merger or change in control, as defined under our 2021 ESPP, a successor corporation may assume or substitute each outstanding purchase right. If the successor corporation refuses to assume or substitute for the outstanding purchase right, the offering period then in progress will be shortened, and a new exercise date will be set that will be before the date of the proposed merger or change in control. The administrator will notify each participant that the exercise date has been changed and that the participant's option will be exercised automatically on the new exercise date unless prior to such date the participant has withdrawn from the offering period.

Amendment; termination. The board will have the authority suspend or terminate our 2021 ESPP and the administrator will have the authority to amend the 2021 ESPP, except that, subject to certain exceptions described in our 2021 ESPP, no such action may adversely affect any outstanding rights to purchase shares of our common stock under our 2021 ESPP. Our 2021 ESPP automatically will terminate in 2040, unless we terminate it sooner.

2016 Equity Incentive Plan, as Amended

Our 2016 Equity Incentive Plan, or the 2016 Plan, allows us to provide incentive stock options, within the meaning of Section 422 of the Code, nonstatutory stock options, stock appreciation rights, restricted stock awards and restricted stock units (each, an "award" and the recipient of such award, a participant) to eligible employees, directors and consultants, including employees and consultants of any of our parent or subsidiary companies. It is expected that as of one business day prior to the effectiveness of the registration statement of which this prospectus forms a part, our 2016 Plan will terminate and we will not grant any additional awards under our 2016 Plan thereafter. However, our 2016 Plan will continue to govern the terms and conditions of the outstanding awards previously granted under our 2016 Plan.

As of December 31, 2020, stock options covering shares of our common stock were outstanding under our 2016 Plan and there were no stock appreciation rights, restricted stock awards or restricted stock units outstanding under our 2016 Plan.

Plan administration. Our compensation committee has the authority, concurrent with our board of directors to administer our 2016 Plan. Different committees may administer our 2016 Plan with respect to different service providers. The administrator has all authority and discretion necessary or appropriate to administer our 2016 Plan and to control its operation, including the authority to construe

and interpret the terms of our 2016 Plan and the awards granted under our 2016 Plan. The administrator's decisions are final and binding on all participants and any other persons holding awards.

The administrator's powers include the power to institute an exchange program (without stockholder approval) under which (1) outstanding awards are surrendered or cancelled in exchange for awards of the same type (which may have higher or lower exercise prices and different terms), awards of a different type and/or cash, (2) participants would have the opportunity to transfer any outstanding awards to a financial institution or other person or entity selected by the administrator and/or (3) the exercise price of an outstanding award is increased or reduced. The administrator's powers also include the power to prescribe, amend and rescind rules and regulations relating to our 2016 Plan, to modify or amend each award and to make all other determinations deemed necessary or advisable for administering our 2016 Plan.

Eligibility. Employees, directors, and consultants, including employees and consultants of any of our parent or subsidiary companies, are eligible to receive awards, provided such consultants render bona fide services not in connection with the offer or sale of securities in a capital-raising transaction and do not directly promote or maintain a market for our securities. Only our employees or employees of our parent or subsidiary companies are eligible to receive incentive stock options. *Stock options*. Stock options have been granted under our 2016 Plan. Subject to the provisions of our 2016 Plan, the administrator determines the term of an option, the number of shares subject to an option, and the time period in which an option may be exercised.

The term of an option is stated in the applicable award agreement, but the term of an option may not exceed 10 years from the grant date. The administrator determines the exercise price of options, which generally may not be less than 100% of the fair market value of our common stock on the grant date, except as provided for in the 2016 Plan. However, an incentive stock option granted to an individual who directly or by attribution owns more than 10% of the total combined voting power of all of our classes of stock or of any our parent or subsidiary companies will have a term of no longer than five years from the grant date and will have an exercise price of at least 110% of the fair market value of our common stock on the grant date. In addition, to the extent that the aggregate fair market value of the shares with respect to which incentive stock options are exercisable for the first time by an employee during any calendar year (under all plans of ours and any of our parent or subsidiary companies) exceeds $100,000, such options will be treated as nonstatutory stock options.

The administrator determines how a participant may pay the exercise price of an option, and the permissible methods are generally set forth in the applicable award agreement. If a participant's status as a "service provider" (as defined in our 2016 Plan) terminates, that participant may exercise the vested portion of his or her option for the period of time stated in the applicable award agreement. Vested options generally will remain exercisable for 30 days or such longer period of time as set forth in the applicable award agreement if a participant's status as a service provider terminates for a reason other than death or disability. If a participant's status as a service provider terminates due to death or disability, vested options generally will remain exercisable for six months from the date of termination (or such other longer period as set forth in the applicable award agreement). In no event will an option remain exercisable beyond its original term. If a participant does not exercise his or her option within the time specified in the award agreement, the option will terminate. Except as described above, the administrator has the discretion to determine the post-termination exercisability periods for an option.

Non-transferability of awards. Unless determined otherwise by the administrator, awards may not be sold, transferred, pledged, assigned, or otherwise alienated or hypothecated in any manner other than by will or by the laws of descent and distribution. In addition, during an applicable participant's lifetime, only that participant may exercise their award. If the administrator makes an

award transferable, such award may only be transferred (1) by will, (2) by the laws of descent and distribution or (3) as permitted by Rule 701 of the Securities Act of 1933, as amended (the Securities Act).

Certain adjustments. If there is a dividend or other distribution (whether in the form of cash, shares, other securities, or other property), recapitalization, stock split, reverse stock split, reorganization, merger, consolidation, split-up, spin-off, combination, repurchase, exchange of shares or our other securities or other change in our corporate structure affecting the shares, the administrator will make proportionate adjustments to the number and class of shares that may be delivered under our 2016 Plan or the number, class and price of shares covered by each outstanding award. The administrator's determination regarding such adjustments will be final, binding, and conclusive.

Dissolution or liquidation. In the event of our proposed dissolution or liquidation, the administrator will notify each participant as soon as practicable prior to the effective date of such proposed transaction. To the extent it has not been previously exercised, an award will terminate immediately prior to the consummation of such proposed action.

Merger and change in control. In the event of our merger with or into another corporation or entity or a "change in control" (as defined in our 2016 Plan), each outstanding award will be treated as the administrator determines, including, without limitation, that (1) awards will be assumed, or substantially equivalent awards will be substituted, by the acquiring or succeeding corporation (or an affiliate thereof) with appropriate adjustments as to the number and kind of shares and prices; (2) upon written notice to a participant, the participant's awards will terminate upon or immediately prior to the consummation of such merger or change in control; (3) outstanding awards will vest and become exercisable, realizable or payable, or restrictions applicable to an award will lapse, in whole or in part, prior to or upon consummation of such merger or change in control, and, to the extent the administrator determines, terminate upon or immediately prior to the effectiveness of such merger or change in control; (4) (a) the termination of an award in exchange for an amount of cash or property, if any, equal to the amount that would have been attained upon the exercise of such award or realization of the participant's rights as of the date of the occurrence of the transaction (and, for the avoidance of doubt, if as of the date of the occurrence of the transaction the administrator determines in good faith that no amount would have been attained upon the exercise of such award or realization of the participant's rights, then such award may be terminated by us without payment) or (b) the replacement of such award with other rights or property selected by the administrator in its sole discretion; or (5) any combination of the foregoing. The administrator will not be obligated to treat all awards, all awards a participant holds or all awards of the same type, similarly.

In the event that the successor corporation does not assume or substitute for an award (or portion thereof), the participant will fully vest in and have the right to exercise all of his or her outstanding options and stock appreciation rights, including shares as to which such awards would not otherwise be vested or exercisable, all restrictions on restricted stock and restricted stock units will lapse, and, with respect to awards with performance-based vesting, all performance goals or other vesting criteria will be deemed achieved at 100% of target levels and all other terms and conditions met. In addition, if an option or stock appreciation right is not assumed or substituted in the event of a merger or change in control, the administrator will notify the participant in writing or electronically that the option or stock appreciation right will be exercisable for a period of time determined by the administrator in its sole discretion, and the option or stock appreciation right will terminate upon the expiration of such period.

Amendment and termination. Our board of directors may, at any time, amend, alter, suspend, or terminate our 2016 Plan in any respect, including, without limitation, amendment of any form of award agreement or instrument to be executed pursuant to our 2016 Plan. To the extent necessary and

desirable to comply with applicable laws, we will obtain stockholder approval of any amendment to our 2016 Plan. No amendment, alteration, suspension, or termination of our 2016 Plan will impair the rights of a participant, unless mutually agreed otherwise between the participant and the administrator in writing. As noted above, it is expected that as of one business day prior to the effectiveness of the registration statement of which this prospectus forms a part, our 2016 Plan will be terminated, and we will not grant any additional awards under our 2016 Plan thereafter.

Executive Incentive Compensation Plan

Prior to the effectiveness of this offering, we expect that our board of directors will adopt the Executive Incentive Compensation Plan, or Incentive Compensation Plan. We expect that our Incentive Compensation Plan will be effective on the business day immediately prior to the effective date of the registration statement of which this prospectus forms a part. Our Incentive Compensation Plan will allow our compensation committee to grant incentive awards, generally payable in cash, to employees selected by our compensation committee, including our named executive officers, based upon performance goals established by our compensation committee.

Under our Incentive Compensation Plan, our compensation committee will determine the performance goals applicable to any award, which goals may include, without limitation, goals related to research and development, regulatory milestones or regulatory-related goals, gross margin, financial milestones, new product or business development, operating margin, product release timelines or other product release milestones, publications, cash flow, procurement, savings, internal structure, leadership development, project, function or portfolio-specific milestones, license or research collaboration agreements, capital raising, initial public offering preparations, patentability and individual objectives such as peer reviews or other subjective or objective criteria. The performance goals may differ from participant to participant and from award to award.

We expect that the compensation committee of our board of directors will administer our Incentive Compensation Plan and will, in its sole discretion and at any time, increase, reduce, or eliminate a participant's actual award, and/or increase, reduce or eliminate the amount allocated to the bonus pool for a particular performance period. The actual award may be below, at or above a participant's target award, in the discretion of the administrator. The administrator may determine the amount of any increase, reduction or elimination on the basis of such factors as it deems relevant, and it will not be required to establish any allocation or weighting with respect to the factors it considers.

Actual awards generally will be paid in cash (or its equivalent) only after they are earned, and, unless otherwise determined by the administrator, to earn an actual award a participant must be employed by us through the date the actual award is paid. The compensation committee may reserve the right to settle an actual award with a grant of an equity award under our then-current equity compensation plan, which equity award may have such terms and conditions, including vesting, as the compensation committee determines. Payment of awards will occur as soon as practicable after they are earned, but no later than the dates set forth in our Incentive Compensation Plan.

Our board of directors and our compensation committee will have the authority to amend, suspend or terminate our Incentive Compensation Plan, provided such action does not impair the existing rights of any participant with respect to any earned awards.

401(k) plan

We maintain a 401(k) retirement savings plan for the benefit of our employees, including our named executive officers who remain employed with us, and who satisfy certain eligibility

requirements. Under the 401(k) plan, eligible employees may elect to defer a portion of their compensation, within the limits prescribed by the Code, on a pre-tax or after-tax (Roth) basis, through contributions to the 401(k) plan. The 401(k) plan authorizes employer safe harbor contributions. The 401(k) plan is intended to qualify under Sections 401(a) and 501(a) of the Code. As a tax-qualified retirement plan, pre-tax contributions to the 401(k) plan and earnings on those pre-tax contributions are not taxable to the employees until distributed from the 401(k) plan, and earnings on Roth contributions are not taxable when distributed from the 401(k) plan.

Limitation of Liability and Indemnification

Our amended and restated certificate of incorporation and amended and restated bylaws, each to be effective upon the completion of this offering, will provide that we will indemnify our directors and officers, and may indemnify our employees and other agents, to the fullest extent permitted by Delaware law. Delaware law prohibits our amended and restated certificate of incorporation from limiting the liability of our directors for the following:

- any breach of the director's duty of loyalty to us or to our stockholders;
- acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law;
- unlawful payment of dividends or unlawful stock repurchases or redemptions; and
- any transaction from which the director derived an improper personal benefit.

If Delaware law is amended to authorize corporate action further eliminating or limiting the personal liability of a director, then the liability of our directors will be eliminated or limited to the fullest extent permitted by Delaware law, as so amended. Our amended and restated certificate of incorporation does not eliminate a director's duty of care and, in appropriate circumstances, equitable remedies, such as injunctive or other forms of non-monetary relief, remain available under Delaware law. This provision also does not affect a director's responsibilities under any other laws, such as the federal securities laws or other state or federal laws. Under our amended and restated bylaws, we will also be empowered to purchase insurance on behalf of any person whom we are required or permitted to indemnify.

In addition to the indemnification required in our amended and restated certificate of incorporation and amended and restated bylaws, we intend to enter into an indemnification agreement with each member of our board of directors and each of our officers prior to the completion of the offering. These agreements provide for the indemnification of our directors and officers for certain expenses and liabilities incurred in connection with any action, suit, proceeding or alternative dispute resolution mechanism or hearing, inquiry or investigation that may lead to the foregoing, to which they are a party, or are threatened to be made a party, by reason of the fact that they are or were a director, officer, employee, agent or fiduciary of our company, or any of our subsidiaries, by reason of any action or inaction by them while serving as an officer, director, agent or fiduciary, or by reason of the fact that they were serving at our request as a director, officer, employee, agent or fiduciary of another entity. In the case of an action or proceeding by or in the right of our company or any of our subsidiaries, no indemnification will be provided for any claim where a court determines that the indemnified party is prohibited from receiving indemnification. We believe that these charter and bylaw provisions and indemnification agreements are necessary to attract and retain qualified persons as directors and officers.

The limitation of liability and indemnification provisions in our amended and restated certificate of incorporation and amended and restated bylaws may discourage stockholders from bringing a lawsuit

against directors for breach of their fiduciary duties. They may also reduce the likelihood of derivative litigation against directors and officers, even though an action, if successful, might benefit us and our stockholders. Moreover, a stockholder's investment may be harmed to the extent we pay the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions. Insofar as indemnification for liabilities arising under the Securities Act may be permitted to our directors, officers and controlling persons pursuant to the foregoing provisions, or otherwise, we have been advised that, in the opinion of the SEC, such indemnification is against public policy as expressed in the Securities Act, and is, therefore, unenforceable. There is no pending litigation or proceeding naming any of our directors or officers as to which indemnification is being sought, nor are we aware of any pending or threatened litigation that may result in claims for indemnification by any director or officer.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

Other than compensation arrangements, including employment, termination of employment and change in control arrangements, with our directors and executive officers, including those discussed in the sections titled “Management” and “Executive Compensation” and the registration rights described in the section titled “Description of Capital Stock—Registration Rights,” the following is a description of each transaction since January 1, 2017 and each currently proposed transaction in which:

- we have been or are to be a participant;
- the amount involved exceeded or exceeds $120,000; and
- any of our directors, executive officers or holders of more than 5% of our outstanding capital stock, or any immediate family member of, or person sharing the household with, any of these individuals or entities, had or will have a direct or indirect material interest.

Convertible Preferred Stock Issuances

From September 2017 through February 2018, we issued and sold an aggregate of 14,314,610 shares of our Series B convertible preferred stock at a purchase price of $4.19152 per share for an aggregate purchase price of $60.0 million.

From February 2019 through August 2019, we issued and sold an aggregate of 12,517,569 shares of our Series C convertible preferred stock at a purchase price of $9.75091 per share for an aggregate purchase price of $122.1 million.

From September 2020 through October 2020, we issued and sold an aggregate of 24,599,042 shares of our Series D convertible preferred stock at a purchase price of $10.06181 per share for an aggregate purchase price of $245.9 million.

Purchasers of our convertible preferred stock include venture capital funds that beneficially own more than 5% of our outstanding capital stock and/or are represented on our board of directors. The following tables present the number of shares and the total purchase price paid by these entities.

Convertible Preferred Stock Issued in Series B Convertible Preferred Stock Financings

Greater than 5% Stockholders[1]	Shares of Convertible Series B Preferred Stock	Aggregate Purchase Price (in thousands)
Lux Ventures IV, L.P.[2]	2,385,769	$ 10,000
MDC Capital Partners (Ventures), LP[3]	2,385,769	$ 10,000
DCVC Opportunity Fund II, L.P.[4]	2,147,192	$ 9,000
Obvious Ventures II, L.P.[5]	1,192,884	$ 5,000
Advantage Capital Utah Partner I, LLC[6]	1,002,023	$ 4,200
Data Collective IV, L.P.[4]	715,730	$ 3,000
Midwest Community Development Fund VIII, L.L.C.[6]	429,438	$ 1,800

(1) Additional details regarding these stockholders and their equity holdings are provided in this prospectus under the section titled “Principal Stockholders.”
(2) See Lux Ventures under the section titled “Principal Stockholders.”
(3) See MDC Capital Partners under the section titled “Principal Stockholders.”
(4) See Data Collective under the section titled “Principal Stockholders.”
(5) See Obvious Ventures under the section titled “Principal Stockholders.”
(6) See Advantage Capital under the section titled “Principal Stockholders.”

Convertible Preferred Stock Issued in Series C Convertible Preferred Stock Financings

Greater than 5% Stockholders[1]	Shares of Convertible Series C Preferred Stock	Aggregate Purchase Price (in thousands)
Scottish Mortgage Investment Trust plc.	5,127,726	$ 50,000
MDC Capital Partners (Ventures), LP[2]	1,538,317	$ 15,000
Lux Co-Invest Opportunities, L.P.[3].	1,025,545	$ 10,000
Data Collective IV, L.P.[4]	615,327	$ 6,000
Obvious Ventures II, L.P.[5]	512,772	$ 5,000
DCVC Opportunity Fund II, L.P.[4]	410,218	$ 4,000

(1) Additional details regarding these stockholders and their equity holdings are provided in this prospectus under the section titled “Principal Stockholders.”
(2) See MDC Capital Partners under the section titled “Principal Stockholders.”
(3) See Lux Ventures under the section titled “Principal Stockholders.”
(4) See Data Collective under the section titled “Principal Stockholders.”
(5) See Obvious Ventures under the section titled “Principal Stockholders.”

Convertible Preferred Stock Issued in Series D Convertible Preferred Stock Financings

Greater than 5% Stockholders[1]	Shares of Convertible Series D Preferred Stock	Aggregate Purchase Price (in thousands)
Bayer Aktiengesellschaft	4,969,284	$ 50,000
Thirty Fifth Investment Company LLC[2]	3,975,427	$ 40,000
DCVC V. L.P.[3]	2,484,642	$ 25,000
Scottish Mortgage Investment Trust plc.	2,484,642	$ 25,000
Lux Co-Invest Opportunities, L.P.[4]	795,085	$ 8,000
Obvious SPV I, L.L.C.[5]	695,699	$ 7,000
MDC Capital Partners (Ventures), LP[2]	496,928	$ 5,000
Midwest Community Development Fund VIII, L.L.C.[6]	372,696	$ 3,750
Lux Ventures IV, L.P.[4]	198,771	$ 2,000

(1) Additional details regarding these stockholders and their equity holdings are provided in this prospectus under the section titled “Principal Stockholders.”
(2) See MDC Capital Partners under the section titled “Principal Stockholders.”
(3) See Data Collective under the section titled “Principal Stockholders.”
(4) See Lux Ventures under the section titled “Principal Stockholders.”
(5) See Obvious Ventures under the section titled “Principal Stockholders.”
(6) See Advantage Capital under the section titled “Principal Stockholders.”

Investors’ Rights Agreement

We are party to an investors’ rights agreement, as amended, with certain holders of our capital stock, including Bayer Aktiengesellschaft, Data Collective IV, L.P., DCVC Opportunity Fund II, L.P., DCVC V, L.P., Lux Co-Invest Opportunities, L.P., Lux Ventures IV, L.P., Obvious SPV I, L.L.C, Obvious Ventures II, L.P., Scottish Mortgage Investment Trust plc, MDC Capital Partners (Ventures), L.P., Thirty Fifth Investment Company L.L.C., Advantage Capital Utah Partner I, L.L.C., Midwest Community Development Fund VIII, L.L.C., Christopher Gibson, Blake Borgeson, and Dean Li. Under our investors’ rights agreement, certain holders of our capital stock have the right to demand that we file a registration statement or request that their shares of our capital stock be covered by a registration statement that we are otherwise filing. See the section titled “Description of Capital Stock—Registration Rights” for additional information regarding these registration rights.

Voting Agreement

We are party to a voting agreement, as amended, with certain holders of our capital stock, including Bayer Aktiengesellschaft, Data Collective IV, L.P., DCVC Opportunity Fund II, L.P., DCVC V, L.P., Lux Co-Invest Opportunities, L.P., Lux Ventures IV, L.P., Obvious SPV I, L.L.C, Obvious Ventures II, L.P., Scottish Mortgage Investment Trust plc, MDC Capital Partners (Ventures), L.P., Thirty Fifth Investment Company L.L.C., Advantage Capital Utah Partner I, L.L.C., Midwest Community Development Fund VIII, L.L.C., Christopher Gibson, Blake Borgeson, and Dean Li. The parties to the voting agreement have agreed, subject to certain conditions, to vote the shares of our capital stock held by them so as to elect the following individuals as directors: (1) one individual designated by Data Collective IV, L.P., currently Zachary Bogue, (2) one individual designated by Lux Ventures IV, L.P., currently Zavain Dar, (3) our chief executive officer, currently Christopher Gibson, (4) one individual designated by the holders a majority of the outstanding shares of common stock i) (a) who are then providing services to the Company or (b) were full-time employees of the Company as of September 25, 2017 and were not terminated by the Company with Cause (as defined therein) (the "Voting Common Holders") and ii) University of Utah Research Foundation, UURF, currently Blake Borgeson, (5) one individual nominated by the Voting Common Holders and UURF and elected by the holders of a majority of the outstanding shares of common stock, voting as a separate class, and the holders of a majority of the outstanding shares of convertible preferred stock, voting as a separate class on an as-converted to common stock basis, currently R. Martin Chavez (6) one individual nominated by Voting Common Holders and UURF and elected by the holders of a majority of the outstanding shares of common stock, voting as a separate class, and the holders of a majority of the outstanding shares of convertible preferred stock, voting as a separate class on an as-converted to common stock basis, currently Dean Li, (7) one individual nominated by the holders of a majority of the outstanding shares of convertible preferred stock, voting as a separate class and on an as-converted to common stock basis, and elected by the holders of a majority of the outstanding shares of convertible preferred stock, voting as a separate class on an as-converted to common stock basis, and the holders of a majority of the outstanding shares of common stock, voting as a separate class, currently Robert Hershberg and (8) one individual elected by the affirmative vote of the holders of a majority of the outstanding shares of common stock, voting as a separate class, and the holders of a majority of the outstanding shares of convertible preferred stock, voting as a separate class on an as-converted to common stock basis, currently Terry-Ann Burrell. Upon the consummation of this offering, the obligations of the parties to the voting agreement to vote their shares so as to elect these nominees, as well as the other rights and obligations under this agreement, will terminate and none of our stockholders will have any special rights regarding the nomination, election or designation of members of our board of directors. Our existing certificate of incorporation contains provisions regarding election of members of the board of directors that correspond to the voting agreement; however, such provisions will be removed in the amended and restated certificate of incorporation that will be effective at the closing of this offering.

Indemnification Agreements

We have entered into separate indemnification agreements with each of our directors and executive officers, in addition to the indemnification provided for in our amended and restated certificate of incorporation and bylaws. The indemnification agreements and our amended restated certificate of incorporation and bylaws that will be in effect upon the closing of this offering require us to indemnify our directors, executive officers and certain controlling persons to the fullest extent permitted by Delaware law. See the section titled "Executive Compensation—Limitation of Liability and Indemnification" for additional information.

Related Party Transaction Policy

Our audit committee will have the primary responsibility for reviewing and approving or disapproving “related party transactions,” which are transactions between us and related persons in which the aggregate amount involved exceeds or may be expected to exceed $120,000 and in which a related person has or will have a direct or indirect material interest. The charter of our audit committee will provide that our audit committee shall review and approve in advance any related party transaction.

Prior to the effectiveness of the registration statement of which this prospectus forms a part, we intend to adopt a formal written policy providing that we are not permitted to enter into any transaction that exceeds $120,000 and in which any related person has a direct or indirect material interest without the consent of our audit committee. In approving or rejecting any such transaction, our audit committee is to consider the relevant facts and circumstances available and deemed relevant to our audit committee, including whether the transaction is on terms no less favorable than terms generally available to an unaffiliated third party under the same or similar circumstances and the extent of the related person’s interest in the transaction.

PRINCIPAL STOCKHOLDERS

The following table sets forth the beneficial ownership of our common stock as of December 31, 2020, by:

- each person, or group of affiliated persons, who is known by us to beneficially own more than 5% of our common stock;
- each of the named executive officers;
- each of our directors; and
- all of our current executive officers and directors as a group.

We have determined beneficial ownership in accordance with the rules of the SEC, and thus it represents sole or shared voting or investment power with respect to our securities. Unless otherwise indicated below, to our knowledge, the persons and entities named in the table have sole voting and sole investment power with respect to all shares that they beneficially owned, subject to community property laws where applicable. The information does not necessarily indicate beneficial ownership for any other purpose, including for purposes of Sections 13(d) and 13(g) of the Exchange Act.

We have based our calculation of the percentage of beneficial ownership prior to this offering on 89,601,858 shares of our common stock outstanding as of December 31, 2020, after giving effect to the automatic conversion of all outstanding shares of our convertible preferred stock into shares of our common stock immediately prior to the completion of this offering. We have based our calculation of the percentage of beneficial ownership after this offering on shares of our common stock outstanding immediately after the completion of this offering, assuming no exercise by the underwriters of their option to purchase additional shares. We have deemed shares of our common stock subject to stock options that are currently exercisable or exercisable within 60 days of December 31, 2020, to be outstanding and to be beneficially owned by the person holding the stock option for the purpose of computing the percentage ownership of that person. We did not deem these shares outstanding, however, for the purpose of computing the percentage ownership of any other person.

Unless otherwise indicated, the address of each beneficial owner listed in the table below is c/o Recursion Pharmaceuticals, Inc., 41 S Rio Grande Street, Salt Lake City, UT 84101.

	Shares Beneficially Owned Prior to This Offering		Shares Beneficially Owned After This Offering	
Name of Beneficial Owner	Shares	Percentage	Shares	Percentage
5% and Greater Stockholders:				
Lux Ventures(1)	11,266,354	12.6%		
Data Collective(2)	8,887,773	9.9%		
MDC Capital Partners(3)	8,396,441	9.4%		
Scottish Mortgage Investment Trust plc(4)	7,612,368	8.5%		
Christopher Gibson(5)	6,353,588	7.1%		
Obvious Ventures(6)	5,217,595	5.8%		
Blake Borgeson(7)	5,121,406	5.7%		
Advantage Capital(8)	4,948,239	5.5%		
Bayer Aktiengesellschaft(9)	4,969,284	5.5%		
Named Executive Officers and Directors:				
Christopher Gibson(5)	6,353,588	7.1%		
Ramona Doyle(10)	20,833	*		
Tina Marriott Larson(11)	333,541	*		
Michael Secora(12)	130,635	*		
Shafique Virani(13)	125,000	*		
Zachary Bogue(14)	8,887,773	9.9%		
Blake Borgeson(7)	5,121,406	5.7%		
Terry-Ann Burrell(15)	14,583	*		
R. Martin Chavez(16)	72,916	*		
Zavain Dar(17)	11,266,354	12.6%		
Robert Hershberg(18)	80,208	*		
Dean Li(19)	2,536,366	2.8%		
All current executive officers and directors as a group (12 persons)(20)	34,922,368	38.8%		

* Represents beneficial ownership of less than 1% of the outstanding shares of our common stock.

(1) Consists of (a) 9,445,724 shares held of record by Lux Ventures IV, L.P. and (b) 1,820,630 held of record by Lux Co-Invest Opportunities, L.P. Lux Venture Partners IV, LLC is the general partner of Lux Ventures IV, L.P. and exercises voting and dispositive power over the shares noted herein held by Lux Ventures IV, L.P. Lux Co-Invest Partners, LLC is the general partner of Lux Co-Invest Opportunities, L.P. and exercises voting and dispositive power over the shares noted herein held by Lux Co-Invest Opportunities, L.P. Peter Hebert and Josh Wolfe are the individual managing members of Lux Venture Partners IV, LLC and Lux Co-Invest Partners, LLC, or the Individual Managers. The Individual Managers, as the sole managers of Lux Venture Partners IV, LLC and Lux Co-Invest Partners, LLC, may be deemed to share voting and dispositive power for the shares noted herein held by Lux Ventures IV, L.P. and Lux Co-Invest Opportunities, L.P. Each of Lux Venture Partners IV, LLC, Lux Co-Invest Partners, LLC, and the Individual Managers separately disclaim beneficial ownership over the shares noted herein except to the extent of their pecuniary interest therein. The address for these entities and individuals is c/o Lux Capital Management, 920 Broadway, 11th Floor, New York, NY 10010.

(2) Consists of (a) 3,845,721 shares held of record by Data Collective IV, L.P., or DCVC IV, (b) 2,557,410 shares held of record by DCVC Opportunity Fund II, L.P., or DCVC Opportunity Fund II, and (c) 2,484,642 shares held of record by DCVC V L.P., or DCVC V. Data Collective IV GP, LLC, or DCVC IV GP, is the general partner of DCVC IV, DCVC Opportunity Fund II GP, LLC, or DCVC Opportunity Fund II GP, is the general partner of DCVC Opportunity Fund II, and DCVC V GP, LLC, DCVC V GP, is the general partner of DCVC V. Zachary Bogue and Matthew Ocko are the managing members of each of DCVC IV GP, DCVC Opportunity Fund II GP, and DCVC V GP. Zachary Bogue and Matthew Ocko exercise voting and dispositive power over the shares held by DCVC IV, DCVC Opportunity Fund II, and DCVC V. The address of the entities listed herein is 270 University Avenue, Palo Alto, California 94301.

(3) Consists of (a) 4,421,014 shares held of record by MDC Capital Partners (Ventures), LP and (b) 3,975,427 shares held of record by Thirty Fifth Investment Company LLC. MDC Capital Partners (Ventures), LP and Thirty Fifth Investment Company LLC, are wholly owned subsidiaries of Mubadala Investment Company PJSC. The address of the entities listed

herein is c/o Mubadala Capital, Al Sila Tower, Al Maryah Island, Abu Dhabi Global Market, 4500 Abu Dhabi, United Arab Emirates.

(4) These securities are held of record by Scottish Mortgage Investment Trust plc, or SMIT. As agent for SMIT, Baillie Gifford & Co may be deemed to share the power to direct the disposition and vote of the securities held by SMIT. Baillie Gifford & Co disclaims beneficial ownership of all shares held by SMIT. SMIT is a publicly traded company. The address for SMIT is c/o Baillie Gifford & Co, Calton Square, 1 Greenside Row, Edinburgh EH1 3AN, United Kingdom.

(5) Consists of (a) 6,211,922 shares of capital stock held of record by Dr. Gibson (b) 100,000 shares of capital stock held by the Gibson Family Trust and (c) 1,000,000 shares subject to options held by Dr. Gibson, 41,666 of which are exercisable and vested within 60 days of December 31, 2020.

(6) Consists of (a) 695,699 shares held of record by Obvious SPV I, L.L.C., or Obvious SPV, and (b) 4,521,896 shares held of record by Obvious Ventures II, L.P., or OV2. The manager of Obvious SPV is Obvious Growth GP I, L.L.C., or OG1 GP. James Joaquin, Vishal Vasishth, Andrew Beebe, Nan Li, and Evan Williams, the managing members of OG1 GP, may be deemed to have shared voting and dispositive power over the shares held by Obvious SPV. The general partner of OV2 is Obvious Ventures GP II, L.L.C., or OV2 GP. James Joaquin, Vishal Vasishth, Andrew Beebe, and Evan Williams, the managing members of OV2 GP, may be deemed to have shared voting and dispositive power over the shares held by OV2 GP. The address for Obvious SPV, OV2, OG1 GP, and OV2 GP is 220 Halleck Street, Suite 120, San Francisco, CA 94129.

(7) Consists of capital stock held of record by Dr. Borgeson.

(8) Consists of (a) 1,022,023 shares held by Advantage Capital Utah Partners I, L.P., or Advantage, and (b) 3,946,216 shares held by Midwest Community Development Fund VIII, L.L.C., or Midwest. The sole member of Advantage is Advantage Capital Utah-MM-I, LLC, or Advantage GP, and the managing member of Midwest is Advantage Capital Community Development Fund, or ACCDF, Advantage GP and ACCDF, in their respective capacities as member and manager of Advantage and Midwest, exercise investment discretion and control of the shares beneficially owned by Advantage and Midwest. Steven T. Stull may be deemed to have voting and investment power with respect to the shares held of record by Advantage and Midwest. The address for entities associated with Advantage and Midwest is 909 Poydras Street, Suite 2230, New Orleans, LA 70112.

(9) These securities are held of record by Bayer Aktiengesellschaft, or Bayer AG, a publicly traded company organized and existing as a stock corporation under German law. No individual stockholder of Bayer AG or group of three or fewer individual stockholders has power to make investment or voting decisions of Bayer AG, and therefore no individual stock holder of Bayer AG is the beneficial owner of the shares. The address for Bayer AG is Kaiser-Wilhelm-Allee 1, 51373 Leverkusen, Germany.

(10) Consists of 500,000 shares subject to options held by Dr. Doyle, 20,833 of which are vested and exercisable within 60 days of December 31, 2020.

(11) Consists of (a) 35,000 shares of capital stock held of record by Ms. Larson and (b) 575,000 shares subject to options held by Ms. Larson, 298,541 of which are exercisable and vested exercisable within 60 days of December 31, 2020.

(12) Consists of (a) 99,385 shares of capital stock held of record by Mr. Secora and (b) 1,593,750 shares subject to options held by Dr. Secora, 31,250 of which are exercisable and vested within 60 days of December 31, 2020.

(13) Consists of (a) 12,000 shares held of record by Dr. Virani and (b) 488,000 shares subject to options held by Mr. Virani, 113,000 of which are vested and exercisable within 60 days of December 31, 2020.

(14) Consists of the shares described in footnote (2) above.

(15) Consists of 291,667 shares subject to options held by Ms. Burrell, 14,853 of which are vested and exercisable within 60 days of December 31, 2020.

(16) Consists of 350,000 shares subject to options held by Dr. Chavez, 72,916 of which are vested and exercisable within 60 days of December 31, 2020.

(17) Consists of the shares described in footnote (1) above.

(18) Consists of 350,00 shares subject to options held by Dr. Hershberg, 80,208 of which are vested and exercisable within 60 days of December 31, 2020.

(19) Consists of (a) 388,334 shares held of record by Dr. Li and (b) 2,148,032 shares held of record by the Dean Li and Ruth Li Revocable Trust.

(20) Consists of (a) 34,270,204 shares beneficially owned by our current executive officers and directors as of December 31, 2020 and (b) 484,457 shares subject to options exercisable within 60 days of December 31, 2020, all of which are vested as of such date.

DESCRIPTION OF CAPITAL STOCK

The following descriptions of our capital stock and certain provisions of our amended and restated certificate of incorporation and amended and restated bylaws are summaries and are qualified by reference to the amended and restated certificate of incorporation and the amended and restated bylaws that will be in effect upon completion of this offering. Copies of these documents will be filed with the SEC as exhibits to our registration statement of which this prospectus forms a part. The descriptions of the common stock and preferred stock reflect changes to our capital structure that will occur upon the completion of this offering.

Immediately prior to the completion of this offering and the filing of our amended and restated certificate of incorporation to be effective upon completion of this offering, our authorized capital stock will consist of shares of common stock, par value $0.00001 per share, and shares of preferred stock, par value $0.00001 per share.

Immediately prior to the completion of this offering, all the outstanding shares of our convertible preferred stock will automatically convert into an aggregate of shares of our common stock.

Based on shares of common stock outstanding as of December 31, 2020, and after giving effect to the automatic conversion of all of our outstanding convertible preferred stock into an aggregate of shares of common stock immediately prior to the completion of this offering and the issuance of shares of common stock in this offering, there will be shares of common stock outstanding upon the completion of this offering. As of December 31, 2020, we had eleven stockholders of record.

Common Stock

Voting Rights

Each holder of common stock is entitled to one vote for each share on all matters submitted to a vote of the stockholders, including the election of directors. Our amended and restated certificate of incorporation and amended and restated bylaws to be in effect upon the completion of this offering do not provide for cumulative voting rights. Because of this, the holders of a plurality of the shares of common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they should so choose. With respect to matters other than the election of directors, at any meeting of the stockholders at which a quorum is present or represented, the affirmative vote of a majority of the voting power of the shares present in person or represented by proxy at such meeting and entitled to vote on the subject matter shall be the act of the stockholders, except as otherwise required by law. The holders of a majority of the stock issued and outstanding and entitled to vote, present in person or represented by proxy, shall constitute a quorum for the transaction of business at all meetings of the stockholders.

Dividends

Subject to preferences that may be applicable to any then-outstanding preferred stock, holders of our common stock are entitled to receive dividends, if any, as may be declared from time to time by our board of directors out of legally available funds.

Liquidation

In the event of our liquidation, dissolution, or winding up, holders of our common stock will be entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities and the satisfaction of any liquidation preference granted to the holders of any then-outstanding shares of preferred stock.

Rights and Preferences

Holders of our common stock have no preemptive, conversion, subscription, or other rights, and there are no redemption or sinking fund provisions applicable to our common stock. The rights, preferences and privileges of the holders of our common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of our preferred stock that we may designate in the future.

Fully Paid and Nonassessable

All of our outstanding shares of common stock are, and the shares of common stock to be issued in this offering, upon payment and delivery in accordance with the underwriting agreement, will be fully paid and nonassessable.

Preferred Stock

Upon the completion of this offering, our board of directors will have the authority, without further action by the stockholders, to issue up to shares of preferred stock in one or more series and to fix the rights, preferences, privileges and restrictions thereof. These rights, preferences and privileges could include dividend rights, conversion rights, voting rights, redemption rights, liquidation preferences, sinking fund terms and the number of shares constituting any series or the designation of such series, any or all of which may be greater than the rights of common stock. The issuance of preferred stock could adversely affect the voting power of holders of common stock and the likelihood that such holders will receive dividend payments and payments upon liquidation. In addition, the issuance of preferred stock could have the effect of delaying, deferring or preventing a change in our control or other corporate action. Upon the completion of this offering, no shares of preferred stock will be outstanding, and we have no present plan to issue any shares of preferred stock.

Options

As of December 31, 2020, we had outstanding options to purchase an aggregate of shares of our common stock, with a weighted-average exercise price of $ per share, under our 2020 Plan.

Registration Rights

After the completion of this offering, under our investors' rights agreement, as amended, the holders of shares of common stock or their transferees, will have the right to require us to register the offer and sale of their shares or to include their shares in any registration statement we file, in each case as described below.

Demand Registration Rights

After the completion of this offering, the holders of up to shares of our common stock will be entitled to certain demand registration rights. Prior to the earlier of September 1, 2025 and 180 days following the date of effectiveness of the registration statement of which this prospectus forms a part, the holders of at least 50% of the shares having registration rights then outstanding can request that we file a registration statement to register the offer and sale of their shares. We are only obligated to effect up to two such registrations. Each such request for registration must cover securities the anticipated aggregate gross proceeds of which, before deducting underwriting discounts and expenses, is at least $5 million. These demand registration rights are subject to specified conditions and limitations, including the right of the underwriters to limit the number of shares included in any such

registration under certain circumstances. If we determine that it would be materially detrimental to us and our stockholders to effect such a demand registration, we have the right to defer such registration, not more than twice in any twelve month period, for a period of up to 180 days.

Form S-3 Registration Rights

After the completion of this offering, the holders of up to shares of our common stock will be entitled to certain Form S-3 registration rights. At any time after the completion of this offering when we are eligible to file a registration statement on Form S-3, the holders of the shares having these rights then outstanding can request that we register the offer and sale of their shares of our common stock on a registration statement on Form S-3 so long as the request covers securities the anticipated aggregate public offering price of which is at least $1 million. These stockholders may make an unlimited number of requests for registration on a registration statement on Form S-3. However, we will not be required to effect a registration on Form S-3 if we have effected three such registrations within the twelve month period preceding the date of the request. These Form S-3 registration rights are subject to specified conditions and limitations, including the right of the underwriters to limit the number of shares included in any such registration under certain circumstances. Additionally, if we determine that it would be seriously detrimental to us and our stockholders to effect such a demand registration, we have the right to defer such registration, not more than twice in any twelve month period, for a period of up to 180 days.

Piggyback Registration Rights

After the completion of this offering, the holders of up to shares of our common stock will be entitled to certain “piggyback” registration rights. If we propose to register the offer and sale of shares of our common stock under the Securities Act, the holders of these shares can request that we include their shares in such registration, subject to certain marketing and other limitations, including the right of the underwriters to limit the number of shares included in any such registration statement under certain circumstances. As a result, whenever we propose to file a registration statement under the Securities Act, other than with respect to (1) a registration solely to employee benefit plans, (2) a registration relating to the offer and sale of debt securities, (3) a registration relating to a corporate reorganization or other transaction covered by Rule 145 promulgated under the Securities Act, (4) a registration on any registration form that does not permit secondary sales or (5) a registration pursuant to the demand or Form S-3 registration rights described in the preceding two paragraphs above, the holders of these shares are entitled to notice of the registration and have the right, subject to certain limitations, to include their shares in the registration.

Expenses of Registration

We will pay all expenses relating to any demand registrations, Form S-3 registrations and piggyback registrations, subject to specified exceptions.

Termination

The registration rights terminate upon the earliest of (1) the date that is two years after the closing of this offering (2) immediately prior to the closing of certain liquidation events and (3) as to a given holder of registration rights, the date after the closing of this offering when such holder of registration rights can sell all of such holder’s registrable securities during any 90-day period pursuant to Rule 144 promulgated under the Securities Act.

Anti-takeover Effects of Certain Provisions of Delaware Law, Our Amended and Restated Certificate of Incorporation and Our Amended and Restated Bylaws

Certain provisions of Delaware law and certain provisions that will be included in our amended and restated certificate of incorporation and amended and restated bylaws summarized below may be deemed to have an anti-takeover effect and may delay, deter or prevent a tender offer or takeover attempt that a stockholder might consider to be in its best interests, including attempts that might result in a premium being paid over the market price for the shares held by stockholders.

Preferred Stock

Our amended and restated certificate of incorporation will contain provisions that permit our board of directors to issue, without any further vote or action by the stockholders, shares of preferred stock in one or more series and, with respect to each such series, to fix the number of shares constituting the series and the designation of the series, the voting rights (if any) of the shares of the series and the powers, preferences, or relative, participation, optional and other special rights, if any, and any qualifications, limitations, or restrictions, of the shares of such series.

Classified Board

Our amended and restated certificate of incorporation will provide that our board of directors is divided into three classes, designated Class I, Class II, and Class III. Each class will be an equal number of directors, as nearly as possible, consisting of one third of the total number of directors constituting the entire board of directors. The term of initial Class I directors shall terminate on the date of the 2022 annual meeting, the term of the initial Class II directors shall terminate on the date of the 2023 annual meeting, and the term of the initial Class III directors shall terminate on the date of the 2024 annual meeting. At each annual meeting of stockholders beginning in 2021, the class of directors whose term expires at that annual meeting will be subject to reelection for a three-year term.

Removal of Directors

Our amended and restated certificate of incorporation will provide that stockholders may only remove a director for cause by a vote of no less than a majority of the shares present in person or by proxy at the meeting and entitled to vote.

Director Vacancies

Our amended and restated certificate of incorporation will authorize only our board of directors to fill vacant directorships.

No Cumulative Voting

Our amended and restated certificate of incorporation will provide that stockholders do not have the right to cumulate votes in the election of directors.

Special Meetings of Stockholders

Our amended and restated certificate of incorporation and amended and restated bylaws will provide that, except as otherwise required by law, special meetings of the stockholders may be called only by an officer at the request of a majority of our board of directors, by the Chair of our board of directors or by our Chief Executive Officer.

Advance notice procedures for director nominations

Our amended and restated bylaws will provide that stockholders seeking to nominate candidates for election as directors at an annual or special meeting of stockholders must provide timely notice thereof in writing. To be timely, a stockholder's notice generally will have to be delivered to and received at our principal executive offices before notice of the meeting is issued by the secretary of the company, with such notice being served not less than 90 nor more than 120 days before the meeting. Although the amended and restated bylaws will not give the board of directors the power to approve or disapprove stockholder nominations of candidates to be elected at an annual meeting, the amended and restated bylaws may have the effect of precluding the conduct of certain business at a meeting if the proper procedures are not followed or may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect its own slate of directors or otherwise attempting to obtain control of the company.

Action by Written Consent

Our amended and restated certificate of incorporation and amended and restated bylaws will provide that any action to be taken by the stockholders must be effected at a duly called annual or special meeting of stockholders and may not be effected by written consent.

Amending our Certificate of Incorporation and Bylaws

Our amended and restated certificate of incorporation may be amended or altered in any manner provided by the Delaware General Corporation Law, or DGCL. Our amended and restated bylaws may be adopted, amended, altered, or repealed by stockholders only upon approval of at least majority of the voting power of all the then outstanding shares of the common stock, except for any amendment of the above provisions, which would require the approval of a two-thirds majority of our then outstanding common stock. Additionally, our amended and restated certificate of incorporation will provide that our bylaws may be amended, altered, or repealed by the board of directors.

Authorized but Unissued Shares

Our authorized but unissued shares of common stock and preferred stock will be available for future issuances without stockholder approval, except as required by the listing standards of Nasdaq, and could be utilized for a variety of corporate purposes, including future offerings to raise additional capital, acquisitions and employee benefit plans. The existence of authorized but unissued and unreserved common stock and preferred stock could render more difficult or discourage an attempt to obtain control of the company by means of a proxy contest, tender offer, merger, or otherwise.

Exclusive Jurisdiction

Our amended and restated bylaws will provide that, unless we consent to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a claim of breach of fiduciary duty, any action asserting a claim arising pursuant to the DGCL, any action regarding our amended and restated certificate of incorporation or amended and restated bylaws, or any action asserting a claim against us that is governed by the internal affairs doctrine. This provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act or any other claim for which the U.S. federal courts have exclusive jurisdiction. Our amended and restated bylaws further provide that the federal district courts of the United States of America will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. Any person or entity purchasing or otherwise acquiring any interest in our securities shall be deemed to have notice of

and consented to these provisions. Although we believe these provisions benefit us by providing increased consistency in the application of law for the specified types of actions and proceedings, the provisions may have the effect of discouraging lawsuits against us or our directors and officers. There is uncertainty as to whether a court would enforce such provisions, and the enforceability of similar choice of forum provisions in other companies' charter documents has been challenged in legal proceedings. We also note that stockholders cannot waive compliance (or consent to noncompliance) with the federal securities laws and the rules and regulations thereunder. See the section titled "Risk Factors—Our amended and restated bylaws that will become effective upon the closing of this offering provide that the Court of Chancery of the State of Delaware and the federal district courts of the United States of America will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees."

Business Combinations with Interested Stockholders

We are governed by Section 203 of the DGCL. Subject to certain exceptions, Section 203 of the DGCL prohibits a public Delaware corporation from engaging in a business combination (as defined in such section) with an "interested stockholder" (defined generally as any person who beneficially owns 15% or more of the outstanding voting stock of such corporation or any person affiliated with such person) for a period of three years following the time that such stockholder became an interested stockholder, unless (1) prior to such time the board of directors of such corporation approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder; (2) upon consummation of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of such corporation at the time the transaction commenced (excluding for purposes of determining the voting stock of such corporation outstanding (but not the outstanding voting stock owned by the interested stockholder) those shares owned (a) by persons who are directors and also officers of such corporation and (b) by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer); or (3) at or subsequent to such time the business combination is approved by the board of directors of such corporation and authorized at a meeting of stockholders (and not by written consent) by the affirmative vote of at least 66 2/3% of the outstanding voting stock of such corporation not owned by the interested stockholder.

Our amended and restated certificate of incorporation and our amended and restated bylaws will provide that we must indemnify our directors and officers to the fullest extent authorized by the DGCL. We are expressly authorized to, and do, carry directors' and officers' insurance providing coverage for our directors, officers and certain employees for some liabilities. We believe that these indemnification provisions and insurance are useful to attract and retain qualified directors and executive officers.

The limitation on liability and indemnification provisions in our certificate of incorporation and bylaws may discourage stockholders from bringing a lawsuit against directors for breach of their fiduciary duty. These provisions may also have the effect of reducing the likelihood of derivative litigation against directors and officers, even though such an action, if successful, might otherwise benefit us and our stockholders. In addition, your investment may be adversely affected to the extent we pay the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions.

Listing

We intend to apply to list our common stock on the Nasdaq Global Select Market under the symbol "RXRX."

Transfer Agent and Registrar

Upon completion of this offering, the transfer agent and registrar for our common stock will be . The transfer agent and registrar's address is .

SHARES ELIGIBLE FOR FUTURE SALE

Prior to this offering, there has been no public market for our common stock, and although we expect that our common stock will be approved for listing on the Nasdaq Global Select Market, we cannot assure investors that there will be an active public market for our common stock following this offering. We cannot predict what effect, if any, sales of our shares in the public market or the availability of shares for sale will have on the market price of our common stock. Future sales of substantial amounts of common stock in the public market, including shares issued upon exercise of outstanding options, or the perception that such sales may occur, however, could adversely affect the market price of our common stock and also could adversely affect our future ability to raise capital through the sale of our common stock or other equity-related securities of ours at times and prices we believe appropriate.

Upon completion of this offering, based on our shares outstanding as of December 31, 2020, and after giving effect to the conversion of all outstanding shares of our convertible preferred stock, shares of our common stock will be outstanding, or shares of common stock if the underwriters exercise their option to purchase additional shares in full. All of the shares of common stock expected to be sold in this offering will be freely tradable without restriction or further registration under the Securities Act unless held by our "affiliates," as that term is defined in Rule 144 under the Securities Act. The remaining outstanding shares of our common stock will be deemed "restricted securities" as that term is defined under Rule 144. Restricted securities may be sold in the public market only if their offer and sale is registered under the Securities Act or if the offer and sale of those securities qualify for an exemption from registration, including exemptions provided by Rules 144 and 701 under the Securities Act, which are summarized below.

As a result of the lock-up agreements and market stand-off provisions described below and the provisions of Rules 144 or 701, the shares of our common stock that will be deemed "restricted securities" will be available for sale in the public market following the completion of this offering as follows:

- no shares will be eligible for sale on the date of this prospectus; and
- shares will be eligible for sale upon expiration of the lock-up agreements and market stand-off provisions described below, following the date that is 180 days after the date of this prospectus.

Lock-up Agreements and Market Stand-Off Agreements

Our officers, directors and the holders of substantially all of our capital stock and options have entered into market stand-off agreements with us and have entered into or will enter into lock-up agreements with the underwriters, subject to certain exceptions, not to dispose of or hedge any of their common stock or securities convertible into or exchangeable for shares of common stock during the period from the date of this prospectus continuing through the date 180 days after the date of this prospectus, except with the prior consent of Goldman Sachs & Co. LLC and J.P. Morgan Securities LLC . See the section titled "Underwriting" for additional information.

Rule 144

Rule 144, as currently in effect, generally provides that, once we have been subject to the public company reporting requirements of Section 13 or Section 15(d) of the Exchange Act for at least 90 days, a stockholder who is not deemed to have been one of our affiliates at any time during the preceding 90 days and who has beneficially owned the shares of our capital stock proposed to be sold

for at least six months is entitled to sell such shares in reliance upon Rule 144 without complying with the volume limitation, manner of sale or notice conditions of Rule 144. If such stockholder has beneficially owned the shares of our capital stock proposed to be sold for at least one year, then such person is entitled to sell such shares in reliance upon Rule 144 without complying with any of the other conditions of Rule 144.

Rule 144 also provides that a stockholder who is deemed to have been one of our affiliates at any time during the preceding 90 days and who has beneficially owned the shares of our common stock proposed to be sold for at least six months is entitled to sell such shares in reliance upon Rule 144 within any three month period beginning 90 days after the date of this prospectus a number of such shares that does not exceed the greater of the following:

- 1% of the number of shares of our capital stock then outstanding, which will equal shares immediately after the completion of this offering, assuming no exercise by the underwriters of their option to purchase additional shares; or
- the average weekly trading volume of our common stock during the four calendar weeks preceding the filing of a notice on Form 144 with respect to such sale.

Sales of our capital stock made in reliance upon Rule 144 by a stockholder who is deemed to have been one of our affiliates at any time during the preceding 90 days are also subject to the current public information, manner of sale and notice conditions of Rule 144.

Rule 701

Rule 701 generally provides that, once we have been subject to the public company reporting requirements of Section 13 or Section 15(d) of the Exchange Act for at least 90 days, a stockholder who purchased shares of our common stock pursuant to a written compensatory benefit plan or contract and who is not deemed to have been one of our affiliates at any time during the preceding 90 days may sell such shares in reliance upon Rule 144 without complying with the current public information or holding period conditions of Rule 144. Rule 701 also provides that a stockholder who purchased shares of our common stock pursuant to a written compensatory benefit plan or contract and who is deemed to have been one of our affiliates during the preceding 90 days may sell such shares under Rule 144 without complying with the holding period condition of Rule 144. However, all stockholders who purchased shares of our common stock pursuant to a written compensatory benefit plan or contract are required to wait until 90 days after the date of this prospectus before selling such shares pursuant to Rule 701.

Registration Rights

After the completion of this offering, the holders of up to shares of our common stock will be entitled to certain rights with respect to the registration of such shares under the Securities Act. The registration of these shares of our common stock under the Securities Act would result in these shares becoming eligible for sale in the public market without restriction under the Securities Act immediately upon the effectiveness of such registration. See the section titled “Description of Capital Stock—Registration Rights” for a description of these registration rights.

Registration Statement

After the completion of this offering, we intend to file a registration statement on Form S-8 under the Securities Act to register all of the shares of our common stock subject to equity awards outstanding or reserved for issuance under our equity compensation plans. The shares of our common stock covered by such registration statement will be eligible for sale in the public market without restriction under the Securities Act immediately upon the effectiveness of such registration statement, subject to vesting restrictions, the conditions of Rule 144 applicable to affiliates, and any applicable market stand-off agreements and lock-up agreements. See the section titled “Executive Compensation—Employee Benefit and Stock Plans” for a description of our equity compensation plans.

MATERIAL U.S. FEDERAL INCOME TAX CONSIDERATION FOR NON-U.S. HOLDERS OF OUR COMMON STOCK

The following is a summary of the material U.S. federal income tax considerations of the ownership and disposition of our common stock acquired in this offering by a "non-U.S. holder" (as defined below), but does not purport to be a complete analysis of all the potential tax considerations relating thereto. This summary is based upon the provisions of the Internal Revenue Code of 1986, as amended, or the Code, Treasury Regulations promulgated thereunder, administrative rulings and judicial decisions, all as of the date hereof. These authorities may be changed, possibly retroactively, so as to result in U.S. federal income tax consequences different from those set forth below. We have not sought, and do not intend to seek, any ruling from the Internal Revenue Service, or IRS, with respect to the statements made and the conclusions reached in the following summary, and there can be no assurance that the IRS or a court will agree with such statements and conclusions.

This summary also does not address the alternative minimum tax, the Medicare contribution tax on net investment income, the tax considerations arising under the laws of any non-U.S., state or local jurisdiction or under U.S. federal gift and estate, tax rules, and does not address tax considerations applicable to an investor's particular circumstances or to investors that may be subject to special tax rules, including, without limitation:

- banks, insurance companies, regulated investment companies, real estate investment trusts, or other financial institutions;
- tax-exempt organizations;
- pension plans and tax-qualified retirement plans;
- controlled foreign corporations, passive foreign investment companies and corporations that accumulate earnings to avoid U.S. federal income tax;
- brokers or dealers in securities or currencies;
- traders in securities that elect to use a mark-to-market method of accounting for their securities holdings;
- persons that own, or are deemed to own, more than 5% of our capital stock (except to the extent specifically set forth below);
- certain former citizens or long-term residents of the United States;
- partnerships (or entities or arrangements classified as such for U.S. federal income tax purposes), other pass-through entities, and investors therein;
- persons who hold our common stock as a position in a hedging transaction, "straddle," "conversion transaction" or other risk reduction transaction;
- persons who hold or receive our common stock pursuant to the exercise of any option or otherwise as compensation;
- persons subject to special tax accounting rules as a result of any item of gross income with respect to our common stock being taken into account in an "applicable financial statement" as defined in Section 451(b) of the Code;
- persons who do not hold our common stock as a capital asset within the meaning of Section 1221 of the Code (generally, property held for investment); or
- persons deemed to sell our common stock under the constructive sale provisions of the Code.

In addition, if a partnership, entity or arrangement classified as a partnership or flow-through entity for U.S. federal income tax purposes holds our common stock, the tax treatment of a partner generally will depend on the status of the partner and upon the activities of the partnership or other entity. A partner in a partnership or other such entity that will hold our common stock should consult his, her or its own tax advisor regarding the tax consequences of the ownership and disposition of our common stock through a partnership or other such entity, as applicable.

You are urged to consult your tax advisor with respect to the application of the U.S. federal income tax laws to your particular situation, as well as any tax consequences of the purchase, ownership and disposition of our common stock arising under the U.S. federal gift or estate tax rules or under the laws of any state, local, non-U.S. or other taxing jurisdiction or under any applicable tax treaty.

Non-U.S. Holder Defined

For purposes of this discussion, you are a "non-U.S. holder" if you are a beneficial owner of our common stock that, for U.S. federal income tax purposes, is not a partnership (including any entity or arrangement treated as a partnership) or:

- an individual who is a citizen or resident of the United States;
- a corporation or other entity taxable as a corporation created or organized in the United States or under the laws of the United States or any political subdivision thereof, or otherwise treated as such for U.S. federal income tax purposes;
- an estate whose income is subject to U.S. federal income tax regardless of its source; or
- a trust (1) whose administration is subject to the primary supervision of a U.S. court and that has one or more U.S. persons who have the authority to control all substantial decisions of the trust or (2) that has made a valid election under applicable Treasury Regulations to be treated as a U.S. person.

Distributions

As described in the section titled "Dividend Policy," we have never declared or paid cash dividends on our capital stock, and we do not anticipate paying any cash dividends following the completion of this offering. However, if we do make distributions on our common stock, those payments will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. To the extent those distributions exceed both our current and our accumulated earnings and profits, the excess will constitute a return of capital and will first reduce your basis in our common stock, but not below zero, and then will be treated as gain from the sale of stock.

Subject to the discussions below on effectively connected income and in the sections titled "—Backup Withholding and Information Reporting" and "—Foreign Account Tax Compliance Act, or FATCA," any dividend paid to you generally will be subject to U.S. federal withholding tax either at a rate of 30% of the gross amount of the dividend or such lower rate as may be specified by an applicable income tax treaty between the United States and your country of residence. In order to receive a reduced treaty rate, you must provide us with a properly executed IRS Form W-8BEN or W-8BEN-E or other appropriate version of IRS Form W-8 certifying qualification for the reduced rate. If you are eligible for a reduced rate of U.S. federal withholding tax pursuant to an income tax treaty, you may obtain a refund of any excess amounts withheld by filing an appropriate claim for refund with the IRS. If you hold our common stock through a financial institution or other agent acting on the non-U.S.

holder's behalf, you will be required to provide appropriate documentation to the agent, which then will be required to provide certification to us or our paying agent, either directly or through other intermediaries.

Dividends received by you that are treated as effectively connected with your conduct of a U.S. trade or business (and, if required by an applicable income tax treaty, are attributable to a permanent establishment or fixed base maintained by you in the United States) are generally exempt from U.S. federal withholding tax, subject to the discussion below in the sections titled "—Backup Withholding and Information Reporting" and "—Foreign Account Tax Compliance Act, or FATCA." In order to obtain this exemption, you must provide us with a properly executed IRS Form W-8ECI or applicable successor form properly certifying such exemption. Such effectively connected dividends, although not subject to U.S. federal withholding tax, are taxed at the same rates applicable to U.S. persons, net of certain deductions and credits, subject to an applicable income tax treaty providing otherwise. In addition, if you are a corporate non-U.S. holder, dividends you receive that are effectively connected with your conduct of a U.S. trade or business may also be subject to a branch profits tax at a rate of 30% or such lower rate as may be specified by an applicable income tax treaty between the United States and your country of residence, as adjusted for certain items. You should consult your tax advisor regarding the tax consequences of the ownership and disposition of our common stock, including any applicable tax treaties that may provide for different rules.

Gain on Disposition of Common Stock

Subject to the discussion in the section titled "—Backup Withholding and Information Reporting," you generally will not be subject to U.S. federal income tax on any gain realized upon the sale or other disposition of our common stock unless:

- the gain is effectively connected with your conduct of a U.S. trade or business (and, if an applicable income tax treaty so provides, the gain is attributable to a permanent establishment or fixed base maintained by you in the United States);
- you are an individual who is present in the United States for a period or periods aggregating 183 days or more during the calendar year in which the sale or disposition occurs and certain other conditions are met; or
- our common stock constitutes a United States real property interest by reason of our status as a "United States real property holding corporation," or USRPHC, for U.S. federal income tax purposes at any time within the shorter of the five-year period preceding your disposition of, or your holding period for, our common stock, unless our common stock is regularly traded on an established securities market and you hold no more than 5% of our outstanding common stock, directly, indirectly and constructively, at all times, during the shorter of the five-year period ending on the date of the taxable disposition or your holding period for our common stock.

We believe that we are not currently and will not become a USRPHC for U.S. federal income tax purposes, and the remainder of this discussion so assumes. However, because the determination of whether we are a USRPHC depends on the fair market value of our U.S. real property relative to the fair market value of our U.S. and worldwide real property plus our other business assets, there can be no assurance that we will not become a USRPHC in the future. If we are a USRPHC and either our common stock is not regularly traded on an established securities market or you hold, or are treated as holding, more than 5% of our outstanding common stock, directly or indirectly, during the applicable testing period, you will generally be taxed on any gain in the same manner as gain that is effectively connected with the conduct of a U.S. trade or business, except that the branch profits tax generally will not apply. If we are a USRPHC and our common stock is not regularly traded on an established securities market, your proceeds received on the disposition of shares will also generally be subject to

withholding at a rate of 15%. You are encouraged to consult your own tax advisors regarding the possible consequences to you if we are, or were to become, a URSPHC.

If you are a non-U.S. holder described in the first bullet above, you will be required to pay tax on the gain derived from the sale (net of certain deductions and credits) under regular U.S. federal income tax rates, and a corporate non-U.S. holder described in the first bullet above also may be subject to the branch profits tax at a 30% rate, or such lower rate as may be specified by an applicable income tax treaty. If you are an individual non-U.S. holder described in the second bullet above, you will be subject to tax on such gain at 30% (or such lower rate specified by an applicable income tax treaty) on the gain derived from the sale, which gain may be offset by U.S. source capital losses for the year, provided you have timely filed U.S. federal income tax returns with respect to such losses. You should consult your tax advisor regarding any applicable income tax or other treaties that may provide for different rules.

Backup Withholding and Information Reporting

Generally, we must report annually to the IRS the amount of dividends paid to you, your name and address and the amount of tax withheld, if any. A similar report will be sent to you. Pursuant to applicable income tax treaties or other agreements, the IRS may make these reports available to tax authorities in your country of residence.

Payments of dividends on or of proceeds from the disposition of our common stock made to you may also be subject to backup withholding at a current rate of 24% unless you establish an exemption, for example, by properly certifying your non-U.S. status on a properly completed IRS Form W-8BEN or W-8BEN-E or another appropriate version of IRS Form W-8. Notwithstanding the foregoing, backup withholding may apply if either we or our paying agent has actual knowledge, or reason to know, that you are a U.S. person.

Backup withholding is not an additional tax; rather, the U.S. federal income tax liability of persons subject to backup withholding will be reduced by the amount of tax withheld. If withholding results in an overpayment of taxes, a refund or credit may generally be obtained from the IRS, provided that the required information is furnished to the IRS in a timely manner.

Foreign Account Tax Compliance Act, or FATCA

The Foreign Account Tax Compliance Act, Treasury Regulations issued thereunder and official IRS guidance, or collectively FATCA, generally impose a U.S. federal withholding tax of 30% on dividends on, and, subject to the discussion of certain proposed Treasury Regulations below, the gross proceeds from a sale or other disposition of our common stock, paid to a “foreign financial institution” (as specially defined under these rules), unless such institution enters into an agreement with the U.S. government to, among other things, withhold on certain payments and to collect and provide to the U.S. tax authorities substantial information regarding the U.S. account holders of such institution (which includes certain equity and debt holders of such institution, as well as certain account holders that are foreign entities with U.S. owners) or otherwise establishes an exemption. FATCA also generally imposes a U.S. federal withholding tax of 30% on dividends on and, subject to the discussion of certain proposed Treasury Regulations below, the gross proceeds from a sale or other disposition of our common stock paid to a “non-financial foreign entity” (as specially defined under these rules) unless such entity provides the withholding agent with a certification identifying the substantial direct and indirect U.S. owners of the entity, certifies that it does not have any substantial U.S. owners, or otherwise establishes an exemption. The withholding tax will apply regardless of whether the payment otherwise would be exempt from U.S. nonresident and backup withholding tax, including under the

other exemptions described above. Under certain circumstances, a non-U.S. holder might be eligible for refunds or credits of such taxes. An intergovernmental agreement between the United States and an applicable foreign country may modify the requirements described in this section. Prospective investors should consult with their own tax advisors regarding the application of FATCA withholding to their investment in, and ownership and disposition of, our common stock.

The Treasury Secretary has issued proposed Treasury Regulations, which, if finalized in their present form, would eliminate withholding under FATCA with respect to payment of gross proceeds from a sale or other disposition of our common stock. In its preamble to such proposed Treasury Regulations, the U.S. Treasury stated that taxpayers may generally rely on the proposed Treasury Regulations until final regulations are issued.

The preceding discussion of U.S. federal tax considerations is for general information only. It is not tax advice to investors in their particular circumstances. Each prospective investor should consult its own tax advisor regarding the particular U.S. federal, state and local and non-U.S. tax consequences of purchasing, holding and disposing of our common stock, including the consequences of any proposed change in applicable laws.

UNDERWRITING

We and the underwriters named below have entered into an underwriting agreement with respect to the shares being offered. Subject to certain conditions, each underwriter has severally agreed to purchase the number of shares indicated in the following table. Goldman Sachs & Co. LLC and J.P. Morgan Securities LLC are the representatives of the underwriters.

Underwriters	Number of Shares
Goldman Sachs & Co. LLC	
J.P. Morgan Securities LLC	
BofA Securities, Inc.	
SVB Leerink LLC	
Allen & Company LLC	
KeyBanc Capital Markets Inc.	
Total	

The underwriters are committed to take and pay for all of the shares being offered, if any are taken, other than the shares covered by the option described below unless and until this option is exercised. Certain of the underwriters may offer and sell shares of our common stock through one or more of their affiliates or selling agents.

The underwriters have an option to buy up to an additional shares from us to cover sales by the underwriters of a greater number of shares than the total number set forth in the table above. They may exercise that option for 30 days. If any shares are purchased pursuant to this option, the underwriters will severally purchase shares in approximately the same proportion as set forth in the table above.

The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters by us. Such amounts are shown assuming both no exercise and full exercise of the underwriters' option to purchase additional shares from us.

	No Exercise	Full Exercise
Per Share	$	$
Total	$	$

Shares sold by the underwriters to the public will initially be offered at the initial public offering price set forth on the cover of this prospectus. Any shares sold by the underwriters to securities dealers may be sold at a discount of up to $ per share from the initial public offering price. After the initial offering of the shares, the representatives may change the offering price and the other selling terms. The offering of the shares by the underwriters is subject to receipt and acceptance and subject to the underwriters' right to reject any order in whole or in part.

We, our officers, directors, and holders of substantially all of our common stock have agreed with the underwriters, subject to certain exceptions, not to i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right, or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, or submit to, or file with, the Securities and Exchange Commission a registration statement under the Securities Act relating to, any shares of our common stock or securities convertible into or exercisable or exchangeable for any shares of our common stock, or publicly disclose the intention to make any offer,

sale, pledge, loan, disposition, or filing, or ii) enter into any swap or other arrangement that transfers all or a portion of the economic consequences associated with the ownership of any shares of common stock or any such other securities (regardless of whether any of these transactions are to be settled by the delivery of shares of common stock or such other securities, in cash or otherwise), in each case without the prior written consent of for a period of 180 days after the date of this prospectus, other than the shares of our common stock to be sold in this offering. The restrictions on our actions, as described above, will be subject to customary exceptions and do not apply to certain transactions.

Goldman Sachs & Co. LLC and J.P. Morgan Securities LLC, in their sole discretion, may release the securities subject to any of the lock-up agreements with the underwriters described above, in whole or in part at any time. This agreement does not apply to any existing employee benefit plans. See the section of this prospectus titled “Shares Eligible for Future Sale” for a discussion of certain transfer restrictions.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act of 1933.

Prior to the offering, there has been no public market for the shares. The initial public offering price has been negotiated among us and the representatives. Among the factors to be considered in determining the initial public offering price of the shares, in addition to prevailing market conditions, will be our historical performance, estimates of our business potential and earnings prospects, an assessment of the our management and the consideration of the above factors in relation to market valuation of companies in related businesses.

We intend to apply to list our common stock on the Nasdaq Global Select Market under the symbol “RXRX.”

In connection with the offering, the underwriters may purchase and sell shares of common stock in the open market. These transactions may include short sales, stabilizing transactions and purchases to cover positions created by short sales. Short sales involve the sale by the underwriters of a greater number of shares than they are required to purchase in the offering, and a short position represents the amount of such sales that have not been covered by subsequent purchases. A “covered short position” is a short position that is not greater than the amount of additional shares for which the underwriters’ option described above may be exercised. The underwriters may cover any covered short position by either exercising their option to purchase additional shares or purchasing shares in the open market. In determining the source of shares to cover the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared to the price at which they may purchase additional shares pursuant to the option described above. “Naked” short sales are any short sales that create a short position greater than the amount of additional shares for which the option described above may be exercised. The underwriters must cover any such naked short position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market after pricing that could adversely affect investors who purchase in the offering. Stabilizing transactions consist of various bids for or purchases of common stock made by the underwriters in the open market prior to the completion of the offering.

The underwriters may also impose a penalty bid. This occurs when a particular underwriter repays to the underwriters a portion of the underwriting discount received by it because the representatives have repurchased shares sold by or for the account of such underwriter in stabilizing or short covering transactions.

Purchases to cover a short position and stabilizing transactions, as well as other purchases by the underwriters for their own accounts, may have the effect of preventing or retarding a decline in the market price of the Company’s stock, and together with the imposition of the penalty bid, may stabilize,

maintain or otherwise affect the market price of the common stock. As a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. The underwriters are not required to engage in these activities and may end any of these activities at any time. These transactions may be effected on the Nasdaq, in the over-the-counter market or otherwise.

Certain of the underwriters and their affiliates have provided in the past to us and our affiliates and may provide from time to time in the future certain commercial banking, financial advisory, investment banking and other services for us and such affiliates in the ordinary course of their business, for which they have received and may continue to receive customary fees and commissions. In addition, from time to time, certain of the underwriters and their affiliates may effect transactions for their own account or the account of customers, and hold on behalf of themselves or their customers, long or short positions in our debt or equity securities or loans, and may do so in the future.

The underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include sales and trading, commercial and investment banking, advisory, investment management, investment research, principal investment, hedging, market making, brokerage, and other financial and non-financial activities and services. Certain of the underwriters and their respective affiliates have provided, and may in the future provide, a variety of these services to the issuer and to persons and entities with relationships with the issuer, for which they received or will receive customary fees and expenses.

In the ordinary course of their various business activities, the underwriters and their respective affiliates, officers, directors, and employees may purchase, sell or hold a broad array of investments and actively trade securities, derivatives, loans, commodities, currencies, credit default swaps and other financial instruments for their own account and for the accounts of their customers, and such investment and trading activities may involve or relate to assets, securities and/or instruments of the issuer (directly, as collateral securing other obligations or otherwise) and/or persons and entities with relationships with the issuer. The underwriters and their respective affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of such assets, securities or instruments and may at any time hold, or recommend to clients that they should acquire, long and/or short positions in such assets, securities and instruments.

Selling Restrictions

Notice to Prospective Investors in the European Economic Area

In relation to each Member State of the European Economic Area, or, in each case, a Relevant State, no securities have been offered or will be offered pursuant to the offering to the public in that Relevant State prior to the publication of a prospectus in relation to the securities which has been approved by the competent authority in that Relevant State or, where appropriate, approved in another Relevant State and notified to the competent authority in that Relevant State, all in accordance with the Prospectus Regulation, except that offers of the securities may be made to the public in that Relevant State at any time under the following exemptions under the Prospectus Regulation:

(a) to any legal entity which is a qualified investor as defined under the Prospectus Regulation;

(b) to fewer than 150 natural or legal persons (other than qualified investors as defined under the Prospectus Regulation), subject to obtaining the prior consent of the representative; or

(c) in any other circumstances falling within Article 1(4) of the Prospectus Regulation,

provided that no such offer of the securities shall require us or any representative to publish a prospectus pursuant to Article 3 of the Prospectus Regulation or supplement a prospectus pursuant to Article 23 of the Prospectus Regulation.

For the purposes of this provision, the expression an “offer to the public” in relation to the securities in any Relevant State means the communication in any form and by any means of sufficient information on the terms of the offer and any securities to be offered so as to enable an investor to decide to purchase or subscribe for any securities, and the expression “Prospectus Regulation” means Regulation (EU) 2017/1129.

Notice to Prospective Investors in the United Kingdom

In relation to the United Kingdom, no shares of common stock have been offered or will be offered pursuant to this offering to the public in the United Kingdom prior to the publication of a prospectus in relation to the shares that either i) has been approved by the Financial Conduct Authority, or ii) is to be treated as if it had been approved by the Financial Conduct Authority in accordance with the transitional provision in Regulation 74 of the Prospectus (Amendment etc.) (EU Exit) Regulations 2019, except that offers of shares may be made to the public in the United Kingdom at any time under the following exemptions under the UK Prospectus Regulation:

- to any legal entity which is a qualified investor as defined in Article 2 of the UK Prospectus Regulation;
- to fewer than 150 natural or legal persons (other than qualified investors as defined in Article 2 of the UK Prospectus Regulation); or
- in any other circumstances falling within section 86 of the Financial Services and Markets Act 2000, FSMA,

provided that no such offer of shares shall require the Issuer or any representative to publish a prospectus pursuant to section 85 of the FSMA or supplement a prospectus pursuant to Article 23 of the UK Prospectus Regulation.

For the purposes of this provision, the expression an “offer to the public” in relation to any shares in any relevant state means the communication in any form and by any means of sufficient information on the terms of the offer and any shares to be offered so as to enable an investor to decide to purchase or subscribe for any shares, and the expression “UK Prospectus Regulation” means Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018.

We have not authorized and do not authorize the making of any offer of shares through any financial intermediary on their behalf, other than offers made by the underwriters with a view to the final placement of the shares as contemplated in this prospectus. Accordingly, no purchaser of the shares, other than the underwriters, is authorized to make any further offer of the shares on behalf of us or the underwriters.

In addition, in the United Kingdom, this document is being distributed only to, and is directed only at, and any offer subsequently made may only be directed at persons who are “qualified investors” (as defined in Article 2 of the UK Prospectus Regulation) i) who have professional experience in matters relating to investments falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended, or the Order, and/or ii) who are high net worth companies (or persons to whom it may otherwise be lawfully communicated) falling within Article 49(2)(a) to (d) of the Order (all such persons together being referred to as “relevant persons”) or otherwise in circumstances which have not resulted and will not result in an offer to the public of the securities in the United Kingdom within the meaning of the FSMA.

Any person in the United Kingdom that is not a relevant person should not act or rely on the information included in this document or use it as basis for taking any action. In the United Kingdom, any investment or investment activity that this document relates to may be made or taken exclusively by relevant persons.

Canada

The securities may be sold in Canada only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions, and Ongoing Registrant Obligations. Any resale of the securities must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this offering memorandum (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 Underwriting Conflicts (NI 33-105), the underwriters are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

Hong Kong

The shares may not be offered or sold in Hong Kong by means of any document other than i) in circumstances which do not constitute an offer to the public within the meaning of the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32 of the Laws of Hong Kong), or the Companies (Winding Up and Miscellaneous Provisions) Ordinance, or which do not constitute an invitation to the public within the meaning of the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong), or the Securities and Futures Ordinance, or ii) to "professional investors" as defined in the Securities and Futures Ordinance and any rules made thereunder, or iii) in other circumstances which do not result in the document being a "prospectus" as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance, and no advertisement, invitation or document relating to the shares may be issued or may be in the possession of any person for the purpose of issue (in each case whether in Hong Kong or elsewhere), which is directed at, or the contents of which are likely to be accessed or read by, the public in Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to shares which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" in Hong Kong as defined in the Securities and Futures Ordinance and any rules made thereunder.

Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the shares may not be circulated or distributed, nor may the shares be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than i) to an institutional investor (as defined under Section 4A of the Securities and Futures Act, Chapter 289 of Singapore, or the SFA) under Section 274 of the SFA, ii) to a relevant person (as defined in

Section 275(2) of the SFA) pursuant to Section 275(1) of the SFA, or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions specified in Section 275 of the SFA or iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA, in each case subject to conditions set forth in the SFA.

Where the shares are subscribed or purchased under Section 275 of the SFA by a relevant person which is a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor, the securities (as defined in Section 239(1) of the SFA) of that corporation shall not be transferable for 6 months after that corporation has acquired the shares under Section 275 of the SFA except: (1) to an institutional investor under Section 274 of the SFA or to a relevant person (as defined in Section 275(2) of the SFA), (2) where such transfer arises from an offer in that corporation's securities pursuant to Section 275(1A) of the SFA, (3) where no consideration is or will be given for the transfer, (4) where the transfer is by operation of law, (5) as specified in Section 276(7) of the SFA, or (6) as specified in Regulation 32 of the Securities and Futures (Offers of Investments) (Shares and Debentures) Regulations 2005 of Singapore, Regulation 32.

Where the shares are subscribed or purchased under Section 275 of the SFA by a relevant person which is a trust (where the trustee is not an accredited investor (as defined in Section 4A of the SFA)) whose sole purpose is to hold investments and each beneficiary of the trust is an accredited investor, the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferable for 6 months after that trust has acquired the shares under Section 275 of the SFA except: (1) to an institutional investor under Section 274 of the SFA or to a relevant person (as defined in Section 275(2) of the SFA), (2) where such transfer arises from an offer that is made on terms that such rights or interest are acquired at a consideration of not less than S$200,000 (or its equivalent in a foreign currency) for each transaction (whether such amount is to be paid for in cash or by exchange of securities or other assets), (3) where no consideration is or will be given for the transfer, (4) where the transfer is by operation of law, (5) as specified in Section 276(7) of the SFA, or (6) as specified in Regulation 32.

Japan

The securities have not been and will not be registered under the Financial Instruments and Exchange Act of Japan (Act No. 25 of 1948, as amended), or the FIEA. The securities may not be offered or sold, directly or indirectly, in Japan or to or for the benefit of any resident of Japan (including any person resident in Japan or any corporation or other entity organized under the laws of Japan) or to others for reoffering or resale, directly or indirectly, in Japan or to or for the benefit of any resident of Japan, except pursuant to an exemption from the registration requirements of the FIEA and otherwise in compliance with any relevant laws and regulations of Japan.

LEGAL MATTERS

The validity of the issuance of our common stock offered in this prospectus will be passed upon for us by Wilson Sonsini Goodrich & Rosati, Professional Corporation, Seattle, Washington. Davis Polk & Wardwell LLP, Menlo Park, California, is acting as counsel for the underwriters.

EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our consolidated financial statements at December 31, 2019 and for the year then ended, as set forth in their report. We have included our financial statements in the prospectus and elsewhere in the registration statement in reliance on Ernst & Young LLP's report, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act with respect to the shares of our common stock offered by this prospectus. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement, as permitted by the rules and regulations of the SEC. For further information with respect to us and our common stock, we refer you to the registration statement, including the exhibits filed as a part of the registration statement. Statements contained in this prospectus concerning the contents of any contract or any other document is not necessarily complete. If a contract or document has been filed as an exhibit to the registration statement, please see the copy of the contract or document that has been filed. Each statement in this prospectus relating to a contract or document filed as an exhibit is qualified in all respects by the filed exhibit. The SEC also maintains an Internet website that contains the registration statement of which this prospectus forms a part, as well as the exhibits thereto. These documents, along with future reports, proxy statements and other information about us, are available at the SEC's website, www.sec.gov.

As a result of this offering, we will become subject to the information and reporting requirements of the Exchange Act and, in accordance with this law, will file periodic reports, proxy statements and other information with the SEC. These periodic reports, proxy statements and other information will be available for inspection and copying at the SEC's public reference facilities and the website of the SEC referred to above. We also maintain a website at www.recursion.com where these materials are available. Upon the completion of this offering, you may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. Information contained on, or that can be accessible through, our website is not a part of this prospectus and the inclusion of our website address in this prospectus is an inactive textual reference only.

RECURSION PHARMACEUTICALS, INC.

Index to Consolidated Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Recursion Pharmaceuticals, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of Recursion Pharmaceuticals, Inc. (the Company) as of December 31, 2019, the related consolidated statements of operations and comprehensive loss, convertible preferred stock and stockholders' deficit and cash flows for the year then ended, 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 at December 31, 2019, and the results of its operations and its cash flows for the year then ended in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

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

We conducted our audit in accordance with the standards of the PCAOB and in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud.

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

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2017.

Salt Lake City, Utah
January 26, 2021

RECURSION PHARMACEUTICALS, INC.

CONSOLIDATED BALANCE SHEET
(In thousands, except share and per share amounts)

	December 31, 2019
ASSETS	
Current assets:	
Cash and cash equivalents	$ 69,883
Restricted cash	5,288
Accounts receivable	151
Other current assets	1,076
Total current assets	76,398
Property and equipment, net	24,370
Other non-current assets	663
Total assets	$ 101,431
LIABILITIES, CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' DEFICIT	
Current liabilities:	
Accounts payable	$ 1,261
Accrued expenses and other liabilities	4,879
Current portion of notes payable	77
Current portion of lease incentive obligation	467
Total current liabilities	6,684
Deferred rent	2,278
Notes payable, net of current portion	12,418
Lease incentive obligation, net of current portion	3,207
Total liabilities	24,587
Commitments and contingencies (Note 9)	
Convertible preferred stock (series A, A-1, B, and C), $0.00001 par value; *61,712,989 shares authorized; 50,126,356 shares issued and outstanding; Liquidation preference of $203,339*	201,109
Stockholders' Deficit:	
Common stock $.00001 par value; *100,000,000 shares authorized; 14,425,074 shares issued and outstanding*	—
Additional paid-in capital	2,330
Accumulated deficit	(126,595)
Total stockholders' deficit	(124,265)
Total liabilities, convertible preferred stock and stockholders' deficit	$ 101,431

See accompanying notes to consolidated financial statements.

RECURSION PHARMACEUTICALS, INC.

CONSOLIDATED STATEMENT OF OPERATIONS AND COMPREHENSIVE LOSS
(In thousands, except per share amounts)

	Year Ended December 31, 2019
Revenue:	
Grant revenue	$ 608
Operating revenue	1,711
Total revenue	2,319
Operating expenses:	
Research and development	45,809
General and administrative	18,951
Total operating expenses	64,760
Loss from operations	(62,441)
Other income, net	562
Net loss and comprehensive loss	$ (61,879)
Net loss per share, basic and diluted	$ (4.30)
Weighted average shares of common stock, basic and diluted	14,380,177

See accompanying notes to consolidated financial statements.

RECURSION PHARMACEUTICALS, INC.

CONSOLIDATED STATEMENT OF CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' DEFICIT
(In thousands, except share amounts)

	Convertible Preferred Stock		Common Stock		Additional Paid-in-Capital	Accumulated Deficit	Stockholders' Deficit
	Shares	Amount	Shares	Amount			
January 1, 2019	37,608,787	$ 81,194	14,305,314	$ —	$ 869	$ (64,716)	$ (63,847)
Net loss	—	—	—	—	—	(61,879)	(61,879)
Vesting of stock options exercised early	—	—	—	—	11	—	11
Exercise of stock options	—	—	119,760	—	65	—	65
Issuance of Series C Convertible preferred stock, net of issuance costs of $2,143	12,517,569	119,915	—	—	—	—	—
Stock-based compensation	—	—	—	—	1,385	—	1,385
Balance at December 31, 2019	50,126,356	$201,109	14,425,074	$ —	$ 2,330	$ (126,595)	$ (124,265)

See accompanying notes to consolidated financial statements.

RECURSION PHARMACEUTICALS, INC.

CONSOLIDATED STATEMENT OF CASH FLOWS
(In thousands)

	Year Ended December 31, 2019
Cash Flows from Operating Activities	
Net loss	$ (61,879)
Adjustments to reconcile net loss to net cash used in operating activities:	
Depreciation	3,543
Stock-based compensation	1,385
Amortization of lease incentive obligation	(499)
Changes in operating assets and liabilities:	
Accounts receivable	(27)
Other assets	632
Accounts payable	(340)
Accrued expenses, deferred revenue, and other current liabilities	143
Net cash used in operating activities	(57,042)
Cash Flows from Investing Activities	
Purchases of property and equipment	(3,910)
Net cash used in investing activities	(3,910)
Cash Flows from Financing Activities	
Proceeds from sale of preferred stock, net of issuance costs	119,915
Proceeds from exercise of stock options	65
Repayment of long-term debt	(11,183)
Proceeds from long-term debt	11,888
Payments of debt issuance costs	(275)
Net cash provided by financing activities	120,410
Net Change in Cash, Cash Equivalents and Restricted Cash	59,458
Cash Equivalents and Restricted Cash, beginning of period	15,713
Cash Equivalents and Restricted Cash, end of period	$ 75,171
Supplemental disclosure of non—cash investing and financing information:	
Vesting of stock options exercised early	$ 11
Supplemental disclosure of cash flow information:	
Cash paid for interest	$ 485

See accompanying notes to consolidated financial statements.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

1. Business and Organization

Business Overview

Recursion Pharmaceuticals, Inc., or Recursion, the Company, or We, was originally formed on November 4, 2013 and is incorporated in Delaware.

Recursion is a biotechnology company that combines automation, artificial intelligence, machine learning, in vivo validation capabilities and a highly cross-functional team to discover novel medicines that expand our collective understanding of biology. Recursion's rich, relatable database of biological images generated in-house on the Company's robotics platform enables advanced machine learning approaches to reveal drug candidates, mechanisms of action, novel chemistry, and potential toxicity, with the eventual goal of decoding biology and advancing new therapeutics that radically improve people's lives.

Liquidity, Risks, and Financial Condition

As of December 31, 2019, the Company had an accumulated deficit of $126,595. The Company expects to incur substantial operating losses in future periods and will require additional capital to advance its drug candidates. The Company does not expect to generate significant revenue from out-licensing transactions, development milestones or royalties until the Company successfully completes significant drug development milestones, with its subsidiaries or in collaboration with third parties, which the Company expects will take a number of years. In order to commercialize its drug candidates, the Company or its partners need to complete clinical development and comply with comprehensive regulatory requirements. The Company is subject to a number of risks and uncertainties similar to those of other companies of the same size within the biotechnology industry, such as uncertainty of clinical trial outcomes, uncertainty of additional funding, and history of operating losses.

The Company is subject to many other risks associated with early-stage enterprises, including increasing competition, limited operating history, the need to develop and refine its discovery platform and development operations, obtaining adequate financing to fulfill its development activities, hiring management and other key personnel, scaling its laboratory processes to maximize throughput capacity, avoiding contamination and other causes of platform downtime and integrating cross-functional operations across the Company's teams. Successful completion of the Company's development programs, and ultimately, the attainment of profitable operations is dependent on future events, including, among other things, its ability to secure financing, attract, retain, and motivate qualified personnel, efficiently manage its supply chain, cost-effectively expand and maintain laboratory operations to accommodate growth, protect its intellectual property, and execute strategic partnerships. Although management believes that the Company will be able to successfully mitigate these risks, there can be no assurance that the Company will be able to do so or that the Company will ever operate profitably.

As of December 31, 2019, the Company did not have any unconditional outstanding commitments for additional funding. On August 27, 2020, the Company's board of directors approved the authorization of the sale and issuance of up to 30,617,846 shares of the Company's Series D Preferred Stock with a par value of $0.00001, which was approved by the Company's stockholders on August 27, 2020. As part of an integrated series of transactions that comprised the Company's Series

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

D Preferred Stock financing, the holders of all of the outstanding convertible notes cancelled and exchanged their outstanding notes and all obligations thereunder for 802,155 Series D Preferred Stock of the Company. Inclusive of the exchange of the convertible note shares, the Company issued and sold 23,367,659, 198,771, and 1,032,612 shares of Series D Preferred Stock, for an aggregate purchase price of $233,507, $2,000, and $10,390 ($10.06 per share), respectively, in September and October 2020.

We will likely be required to raise additional capital. If the Company is unable to access additional funds when needed, it may not be able to continue the development of its products or the Company could be required to delay, scale back or abandon some or all of its development programs and other operations. Any additional equity financing, if available to the Company, may not be available on favorable terms, most likely will be dilutive to its current stockholders, and debt financing, if available, may involve restrictive covenants and dilutive financing instruments. If the Company accesses funds through partnership or licensing arrangements, it may be required to relinquish rights to some of its technologies or product candidates that it would otherwise seek to develop or commercialize on its own, and access to such funds may be on terms that are not favorable to the Company. The Company's ability to access capital when needed is not assured and, if not achieved on a timely basis, could materially harm its business, financial condition and results of operations.

Note 2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying financial statements have been prepared in accordance with U.S. generally accepted accounting principles, or GAAP.

Segment Information

We have determined that we operate as a single operating segment and have one reportable segment. The Company's chief operating decision maker is its chief executive officer, who allocates resources and assesses performance at the consolidated level.

Principles of Consolidation

The consolidated financial statements include the Company's accounts and those of its wholly-owned subsidiaries: Recursion Pharmaceuticals GmbH, incorporated in Germany, and CereXis, incorporated in the United States. All significant intercompany balances and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates, judgments, and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Actual results could differ materially from those estimates. Significant estimates and assumptions made by management include the estimated lives of long-lived assets (property and equipment), the fair value of stock-based awards issued, clinical trial accruals, and estimates used to determine our valuation allowance.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Fair Value of Financial Instruments

The accounting guidance defines fair value, establishes a consistent framework for measuring fair value and expands disclosure for each major asset and liability category measured at fair value on either a recurring ornon-recurringbasis. Fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. As a basis for considering such assumptions, the accounting guidance establishes a three-tier fair value hierarchy, which prioritizes the inputs used in measuring fair value as follows:

Level1: Quoted prices in active markets for identical assets or liabilities.

Level2: Observable inputs, other than the quoted prices in active markets, that are observable either directly or indirectly.

Level3: Unobservable inputs in which there is little or no market data, which require the reporting entity to develop its own assumptions.

Our financial instruments include cash equivalents, accounts receivable, other assets, accounts payable and accrued expenses. Fair value estimates of these instruments are made at a specific point in time, based on relevant market information. These estimates may be subjective in nature and involve uncertainties and matters of significant judgement and therefore cannot be determined with precision. The carrying amount of cash equivalents, account receivable, other assets, accounts payable and accrued expenses are generally considered to be representative of their respective values because of the short-term nature of those instruments. The fair value of the Company's Preferred Stock warrant liability was valued using the option-pricing model (Level 3).

Concentration of Credit Risk

Financial instruments that potentially subject the Company to a concentration of credit risk consist of cash and cash equivalents. All of the Company's cash and cash equivalents are primarily held at two U.S. financial institutions that management believes is of high credit quality. Such deposits may, at times, exceed federally insured limits.

Cash and Cash Equivalents and Restricted Cash

Cash consists of bank deposits held in checking and savings accounts. The Company considers all highly liquid investments with maturities of 90 days or less when purchased to be "cash equivalents."

During 2019, the Company began a new commercial banking relationship with JP Morgan. The Company is required to maintain a $1,000 balance in a collateralized account to secure the Company's credit cards. As of December 31, 2019, cash restricted to the collateralization of letters of credit was $4,288. These amounts are included as restricted cash on the Consolidated Balance Sheet.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

The following table provides a reconciliation of cash and cash equivalents and restricted cash reported within the Consolidated Balance Sheet that sum to the total of the same such amounts shown in the Consolidated Statement of Cash Flows. Cash and cash equivalents and restricted cash consists of the following (in thousands):

	December 31, 2019
Cash and cash equivalents	$ 69,883
Restricted cash	5,288
Total	$ 75,171

Property and Equipment

Property and equipment is carried at acquisition cost less accumulated depreciation. The cost of normal, recurring, or periodic repairs and maintenance activities related to property and equipment are expensed as incurred.

Depreciation is computed using the straight-line method based on the estimated useful lives of the related assets. The estimated useful lives by asset classification are generally as follows:

Software/Licenses	3 years
Office Equipment	5 years
Computer Equipment	5 years
Lab Equipment	7 years
Leasehold Improvements	Lesser of 15 years or the remainder of the lease

Property and equipment are reviewed for impairment as discussed below under Accounting for the Impairment of Long-Lived Assets.

Accounting for the Impairment of Long-Lived Assets

Long-lived assets, such as property and equipment and intangible assets subject to amortization, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. If circumstances require a long-lived asset or asset group be tested for potential impairment, the Company first compares undiscounted cash flows expected to be generated by that asset or asset group to its carrying value. If the carrying value of the long-lived asset or asset group is not recoverable on an undiscounted cash flow basis, an impairment is recognized to the extent that carrying value exceeds fair value. Fair value is determined using various valuation techniques, including discounted cash flow models, quoted market values, and third-party independent appraisals, depending on the nature of the asset. No impairment was identified for the year ended December 31, 2019.

Leases

The Company rents its facilities under operating lease agreements and recognizes related rent expense on a straight-line basis over the terms of the leases. The lease agreements contain tenant improvement allowances, rent holidays, scheduled rent increases, and renewal options. Rent holidays

and scheduled rent increases are included in the determination of rent expenses recorded over the lease term. The Company has accrued for rent expense incurred but not paid. Renewals are not assumed in the determination of the lease term unless they are deemed to be reasonably assured at the inception of the lease. The Company recognizes rent expense beginning on the date it obtains the legal right to use and control the leased space. The Company's leases include tenant improvement allowances from the landlords for structural and cosmetic changes to the new space. Tenant improvement allowances are accounted for as property and equipment, with a corresponding lease incentive obligation, which is amortized as a reduction to rent expense over the respective lease terms.

Revenue Recognition

The Company adopted Accounting Standards Update, or ASU, 2014-09, or ASC 606, effective January 1, 2019 using the full retrospective transition method. All disclosures set forth in these footnotes have been updated to comply with the new standard. The adoption of ASC 606 did not result in a change to the accounting for any of the revenue streams, receivables or other accounts; as such, no cumulative effect adjustment was recorded.

Grant Revenue

The Company recognizes grant revenue in the period in which the revenue is earned in accordance with the grant agreement, which is the period in which corresponding reimbursable expenses under the grant agreement are incurred. During the year ended December 31, 2019, the Company recognized $608 as revenue from grants.

During the year ended December 31, 2017, the Company was awarded a private grant by the Bill and Melinda Gates Foundation. On November 17, 2017, the Bill and Melinda Gates Foundation distributed $546 to the Company, pursuant to such grant. Revenue was recognized as qualifying activities were performed. There was no remaining unearned revenue balance related to this grant as of December 31, 2019. Revenue recognized related to this grant during the year ended December 31, 2019 was $223. As of December 31, 2019, there were no remaining amounts in the segregated account available for funding.

During the year ended December 31, 2018, the Company was awarded a grant by the National Institutes of Health, which included potential funding of $1,391. Revenue recognized related to this grant during the year ended December 31, 2019 was $385. As of December 31, 2019, $448 of the potential funding still remained.

Operating Revenue

Operating revenue has primarily been generated through a funded research and development agreement with Takeda Pharmaceutical Company Limited (see Note 13. Collaborative and Other Research and Development Contracts). During the year ended December 31, 2019, the Company recognized $1,334 of operating revenue from milestones related to this agreement.

Accounts Receivable

Receivables from grants are recorded for amounts due to the Company related to reimbursable research and development costs from the U.S. National Institute of Health. These receivables are

evaluated to determine if any reserve or allowance should be established at each reporting date. As of December 31, 2019, the Company had $142 in outstanding receivables with the U.S. National Institute of Health, all of which are deemed to be collectible.

Invoices are submitted to the U.S. National Institute of Health related to reimbursable research and development costs. The Company is also entitled to reimbursement of indirect costs based on rates stipulated in the underlying grant agreement. The Company's calculations of its indirect cost rates are subject to audit by the U.S. Government.

Research and Development Expenses

Research and development expenses comprise costs incurred in performing research and development activities, including drug discovery studies and drug development studies, external research and for the purchase of laboratory supplies. The Company recognizes expenses associated with third-party contracted services based on the completion of activities as specified in the applicable contracts. Upon termination of contracts with third-parties, the Company's financial obligations are limited to costs incurred or committed to date. Any advance payments for goods or services to be used or rendered in future research and product development activities pursuant to a contractual arrangement are classified as prepaid expenses until such goods or services are rendered.

Accruals for research and development expenses and clinical trials

As part of the process of preparing its financial statements, the Company is required to estimate its expenses resulting from its obligations under contracts with vendors, clinical research organizations and consultants, and under clinical site agreements in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations, which vary from contract to contract and may result in payment terms that do not match the periods over which materials or services are provided for under such contracts. The Company's objective is to reflect the appropriate expenses in its financial statements by matching those expenses with the period in which services are performed and efforts are expended. The Company accounts for these expenses according to the timing of various aspects of the expenses. The Company determines accrual estimates by taking into account discussion with applicable personnel and outside service providers as to the progress of clinical trials, or the services completed. During the course of a clinical trial, the Company adjusts its clinical expense recognition if actual results differ from its estimates. The Company makes estimates of its accrued expenses as of each balance sheet date based on the facts and circumstances known to it at that time. The actual expenses could be different from the amounts accrued.

Interest Expense and Deferred Financing Costs

Interest expense for the year ended December 31, 2019 was $635 and primarily relates to the Pacific Western Loan Agreement and Midcap Financial Loan Agreement (defined in Note 5, "Note Payable"). Costs directly associated with the negotiation and execution of the loan agreements have been capitalized and are netted against the notes payable on the balance sheet. In prior years, the Company granted warrants to purchase Series A and Series B Convertible Preferred Stock pursuant to the loan agreement with Pacific Western. The initial fair value of the warrants was capitalized and netted against the notes payable on the balance sheet and is being recorded to interest expense over the life of the loan. Subsequent changes in the fair value of the related warrant liability are recorded as

other income or expense in the year that the changes in fair value occur. Capitalized deferred financing costs are amortized to interest expense over the term of the loan agreement using the effective interest rate method. Amortization of deferred financing costs and original issue discount included in interest expense was $36 for the year ended December 31, 2019. Income related to subsequent remeasurement of warrants was $11 for the year ended December 31, 2019. Interest expense, along with interest income of $1,741 related to our cash accounts, and income related to the remeasurement of the warrants are included in other income, net, on the consolidated statement of operations and comprehensive loss.

We capitalize certain legal, professional, accounting and other third-party fees that are directly associated with in-process equity financings as deferred issuance costs until such financings are consummated. After consummation of such financings, these costs are recorded as a reduction of the proceeds generated as a result of the offering. Should the planned equity financing be abandoned, the deferred issuance costs will be expensed immediately in the Consolidated Statement of Operations and Comprehensive Loss.

Classification and Accretion of Convertible Preferred Stock

The Company's convertible preferred stock is classified outside of stockholders' deficit on the Consolidated Balance Sheet because the holders of such shares have liquidation rights in the event of a deemed liquidation that, in certain situations, are not solely within the control of the Company and would require the redemption of the then-outstanding convertible preferred stock. The convertible preferred stock is not redeemable, except in the event of a deemed liquidation (see Note 6. "Convertible Preferred Stock"). Because the occurrence of a deemed liquidation event is not currently probable, the carrying values of the convertible preferred stock are not being accreted to their redemption values. Subsequent adjustments to the carrying values of the convertible preferred stock would be made only when a deemed liquidation event becomes probable.

Stock-Based Compensation

The Company recognizes stock-based compensation expense in the Statement of Operations and Comprehensive Loss for all share-based payments to employees and directors. The Company records compensation expense over an award's requisite service period, or vesting period, based on the award's fair value at the date of grant. Awards generally vest over four years for employees. The Company uses the Black-Scholes option-pricing model to determine the fair value of each option grant as of the date of grant. The Black-Scholes option pricing model requires inputs for risk-free interest rate, dividend yield, expected stock price volatility and expected term of the options. The fair value of the options is recognized as expense on a straight-line basis over the requisite service period (see Note 8, "Share-based Compensation" for additional details). We recognize the impact of forfeitures on stock-based compensation expense as forfeitures occur. We apply the straight-line method of expense recognition to all awards with only service-based vesting conditions.

Income Taxes

The asset and liability approach is used for the financial reporting for income taxes. Deferred income balances reflect the effects of temporary differences between the financial reporting and income tax bases of the Company's assets and liabilities and are measured using enacted tax rates

expected to apply when taxes are actually paid or recovered. In addition, deferred tax assets are recorded for the future benefit of utilizing net operating losses, or NOLs, and research and development credit carryforwards and are measured using the enacted tax rates and laws that will be in effect when such items are expected to reverse.

A valuation allowance is provided against deferred tax assets if it is more likely than not that some portion or all of the deferred tax asset will not be realized. In making such determination, we consider all available positive and negative evidence, including taxable income in available carryback periods, future reversals of existing taxable temporary differences, tax planning strategies, and future taxable income exclusive of reversing temporary differences and carryforwards.

Net Loss per share

Basic net loss per share is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period.

The Company applies the two-class method to calculate its basic and diluted net loss per share as the Company has issued shares that meet the definition of participating securities. The two-class method is an earnings allocation formula that treats a participating security as having rights to earnings that otherwise would have been available to common stockholders. The Company's participating securities contractually entitle the holders of such shares to participate in dividends; but do not contractually require the holders of such shares to participate in losses of the Company. Accordingly, in periods in which the Company reports a net loss, such losses are not allocated to such participating securities.

As the Company reported a net loss for the year ended December 31, 2019, diluted net loss per share is the same as basic net loss per share, since dilutive common shares are not assumed to have been issued if their effect is anti-dilutive.

Emerging Growth Company

Section 102(b)(1) of the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, exempts emerging growth companies from being required to comply with new or revised financial accounting standards until private companies (that is, those that have not had a Securities Act registration statement declared effective or do not have a class of securities registered under the Exchange Act) are required to comply with the new or revised financial accounting standards. The JOBS Act provides that an emerging growth company can elect to opt out of the extended transition period and comply with the requirements that apply to non-emerging growth companies but any such an election to opt out is irrevocable. The Company has elected not to opt out of such extended transition period, which means that when a standard is issued or revised and it has different application dates for public or private companies, the Company, as an emerging growth company, can adopt the new or revised standard at the time private companies adopt the new or revised standard.

This may make comparison of the Company's financial statements with another public company that is neither an emerging growth company nor an emerging growth company that has opted out of using the extended transition period difficult or impossible because of the potential differences in accounting standards used.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Recent Accounting Pronouncements

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), or ASU 2016-02. Under Topic 842, the Company will be required to recognize a lease liability and a right-of-use asset for all leases (with the exception of short-term leases) at the commencement date of each lease. ASU 2016-02 is effective for annual and interim periods beginning on or after December 15, 2021 and early adoption is permitted. The Company is evaluating the effect that ASU 2016-02 will have on its consolidated financial statements and related disclosures. The Company will adopt the new standard on January 1, 2022.

Note 3. Property and Equipment

Property and Equipment consisted of the following:

	December 31, 2019
Lab equipment	$ 16,113
Leasehold improvements	12,897
Office equipment	1,075
	30,085
Less: Accumulated depreciation	(5,715)
Property and equipment, net	$ 24,370

Depreciation expense on property and equipment was $3,543 for the year ended December 31, 2019.

Note 4. Accrued Expenses and Other Liabilities

Accrued Expenses and Other Liabilities consisted of the following:

	December 31, 2019
Accrued compensation	$ 1,704
Accrued development expenses	941
Accrued property tax and rent expense	292
Accrued other expenses	1,942
Accrued expense and other liabilities	$ 4,879

Note 5. Notes Payable

Midcap Financial

In September 2019, the Company entered into a new Credit and Security Agreement with Midcap Financial Trust, or Midcap, and the other lenders party thereto, or the Midcap loan agreement. The Midcap loan agreement provides for a term loan facility that includes: i) an initial tranche in an aggregate principal amount of $11,888; and ii) a second tranche of up to $15,000 in aggregate principal amount, which if drawn would result in an aggregate outstanding maximum principal amount of $26,888. The second tranche will become available for the Company to borrow through March 31,

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

2021 upon the achievement of certain drug development milestones. The Company used a portion of the proceeds of the initial tranche of term loans to fully repay its outstanding term loans under the Pacific Western Bank loan agreement described below for $11,199. Proceeds of the term loans under the Midcap loan agreement may be used for general corporate purposes. As of December 31, 2019, the outstanding principal balance under the Midcap loan agreement was $11,888.

Interest on the Midcap term loans accrues on the principal amount outstanding at a floating per annum rate equal to the LIBOR rate plus 5.75% and is payable monthly in arrears. The Company is required to make interest-only payments from September 2019 to September 2021, and thereafter, 36 monthly principal payments of $330 plus interest commencing in October 2021 and continuing until the maturity date in September 2024. The interest only period will be extended an additional 12 months if the Company achieves certain fundraising-related milestones.

The Company may voluntarily prepay the Midcap term loans at any time, subject to certain minimum repayment requirements and prepayment fees. The Midcap term loans are subject to mandatory prepayment with the proceeds of certain casualty events and asset sales.

The debt is secured against substantially all of the assets of the Company. The Midcap loan agreement includes standard affirmative and restrictive covenants, including covenants limiting the ability of the Company and its subsidiaries, among other things, to dispose of assets, grant certain licenses, make investments, merger or consummate acquisitions, incur debt, grant liens and make dividends or distributions, in each case subject to certain exceptions. The loan agreement also includes standard events of default, including, subject to grace periods in certain instances, payment defaults, breaches of covenants, breaches of representations and warranties, cross-defaults with certain other indebtedness, insolvency and bankruptcy defaults, change of control of the Company or any subsidiary, and a material adverse change in the business, operations or conditions of the Company. Upon the occurrence of an event of default, Midcap may declare all outstanding obligations immediately due and payable, increase the applicable interest rate by 2% and take such other actions as set forth in the Credit and Security Agreement. At December 31, 2019, the Company was in compliance with all debt covenants.

In 2019, the Company paid fees of approximately $298 in connection with the origination of the Credit and Security Agreement. These fees were deferred and recorded as a direct deduction from the carrying value of the loan payable and are amortized to interest expense over the remaining term of the Credit Agreement.

Pacific Western

In December 2016, the Company and Pacific Western Bank, or Pacific, entered into a loan and security agreement to provide term loans in an aggregate principal amount of up to $4,000, or the Pacific loan agreement. In February 2018, the Company and Pacific amended the loan agreement to increase the aggregate term loan commitments to an aggregate principal amount of $16,199, of which the Company borrowed $11,199. The term loans under the Pacific loan agreement were secured by substantially all of the Company's assets, other than intellectual property. In connection with the original Pacific loan agreement and the amendment, the Company issued Pacific fully-vested warrants to purchase Series A Preferred Stock and Series B Preferred Stock. The initial fair value of the warrants was recorded as a direct deduction from the carrying value of the notes payable on the

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Consolidated Balance Sheet and was being amortized as interest expense over the term of the loan agreement. The warrants are recorded at fair value as a liability on the Consolidated Balance Sheet. Changes in the fair value of the warrant liability are recorded as other income or expense in the Consolidated Statement of Operations and Comprehensive Loss. See Note 8 “Share-based Compensation” for more information on warrants.

In September 2019, the Company fully repaid all outstanding term loans related to the Pacific Western agreement. A loss on the extinguishment of debt of $555 was recognized during fiscal 2019 related to the write-off of unamortized debt issuance costs, unamortized warrants and a final payment fee. This loss is included in other income, net, in the consolidated statement of operations and comprehensive loss.

On May 8, 2018, Pacific issued an irrevocable standby letter of credit in the face amount of $3,800 for the benefit of the Company’s landlord, securing certain Company obligations relating to tenant improvements. As of December 31, 2019, the outstanding letter of credit was $3,800, for which the Company held $4,288 of restricted cash as collateral.

Convertible Notes

On March 13, 2020 and April 9, 2020, the Company issued convertible promissory notes for an aggregate principal amount of $6,400. If the Company raises capital by issuing preferred stock for aggregate proceeds of at least $50,000, the convertible notes will automatically convert into preferred shares of the Company at a price of 80% of the price per share to be paid by the preferred shareholders. As previously noted, these converted to 802,155 shares of Series D Preferred Stock in September 2020.

Notes payable for Midcap Loan Agreement and Tenant Improvement Allowance

In 2018, the Company also elected to borrow an additional $992 that was available under our lease from our landlord to be used on tenant improvements. See Note 9 “Commitments and Contingencies” for more information. Under the terms of the lease, the note is to be repaid over a 10-year period at an 8% interest rate.

Notes payable for the Midcap loan agreement and tenant improvement allowance consisted of the following:

	December 31, 2019
Current portion of notes payable	$ 77
Long-term portion of notes payable	12,693
Less unamortized issuance costs	(275)
Notes payable, net	$ 12,495

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

The following table presents information regarding the Company's debt principal repayment obligation as of December 31, 2019:

Years Ended December 31,	
2020	$ 77
2021	1,074
2022	4,052
2023	4,060
2024	3,077
Thereafter	430
Total Debt Principal Payments	$12,770

Note 6. Convertible Preferred Stock

In November 2013, the Company was formed under the laws of the State of Delaware as Recursion Pharmaceuticals, LLC, a limited liability company. Between March 2014 and November 2015, the Company issued and sold $3,872 of principal of convertible promissory notes.

In September 2016, as part of an integrated series of transactions that comprised the Company's Series A Preferred Stock financing, the holders of all of the outstanding convertible promissory notes cancelled and exchanged their outstanding promissory notes and all obligations thereunder for 3,817,836 Series A Preferred Units, and 3,317,014 Series A-1 Preferred Units of the Company. Immediately after such exchange, Recursion Pharmaceuticals, LLC was converted from a Delaware limited liability company to Recursion Pharmaceuticals, Inc., a Delaware corporation, and each outstanding Common Unit, Series A Preferred Unit and Series A-1 Preferred Unit was exchanged on a one-for-one basis for a share of Common Stock, Series A Preferred Stock, and Series A-1 Preferred Stock, respectively. In September 2016 and November 2016, the Company issued and sold 12,119,208 and 1,994,834 shares of Series A Preferred Stock, respectively, for an aggregate purchase price of $12,910 and $2,125 ($1.06525 per share), respectively.

In July 2017, as part of an integrated series of transactions that comprised the Company's Series B Preferred Stock financing, the Company issued and sold 2,045,292 shares of Series A Preferred Stock for an aggregate purchase price of $2,179 ($1.06525 per share). In September 2017, and February 2018, the Company issued and sold 13,312,580 and 1,002,023 shares of Series B Preferred Stock for an aggregate purchase price of $55,800 and $4,200 ($4.19152 per share), less issuance costs of $87, respectively.

In February 2019, the Company issued and sold 11,511,733 shares of Series C Preferred Stock for an aggregate purchase price of $112,250 ($9.75091 per share). In a series of additional closings ending in June and August, 2019, the Company issued and sold 951,190 additional shares of Series C Preferred Stock for an aggregate purchase price of $9,275 ($9.75091 per share), less issuance costs of $2,143, which included 54,646 shares of Series C Preferred Stock as payment to a third party with a fair value of $533 ($9.75091 per share).

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Convertible Preferred Stock consisted of the following:

	December 31, 2019				
	Preferred Shares Authorized	Preferred Shares Issued and Outstanding	Carrying Value	Liquidation Preferences	Shares of Common Stock Issuable Upon Conversion
Series A preferred stock	20,052,268	19,977,170	$ 19,390	$ 21,281	19,977,170
Series A-1 preferred stock	3,317,014	3,317,014	1,891	—	3,317,014
Series B preferred stock	14,343,707	14,314,603	59,913	60,000	14,314,603
Series C preferred stock	24,000,000	12,517,569	119,915	122,058	14,857,528
Total convertible preferred stock	61,712,989	50,126,356	$ 201,109	$ 203,339	52,466,315

Liquidation Preference

In the event of any liquidation, dissolution or winding up of the Company, either voluntary or involuntary, the holders of the Series C Preferred Stock, Series B Preferred Stock, and Series A Preferred Stock shall be entitled to receive, on a pari passu basis, prior and in preference to any distribution of any of the assets of the Company to the holders of the Series A-1 Preferred Stock or the Common Stock by reason of their ownership of such stock, an amount equal to the sum of i) the original issue price of $9.75091 per share of Series C Preferred Stock, $4.19152 per share of Series B Preferred Stock and $1.06525 per shares of Series A Preferred Stock and ii) all declared by unpaid dividends (if any). If upon the liquidation, dissolution or winding up of the Company, the assets of the Company legally available for distribution to the holders of the Series C Preferred Stock, Series B Preferred Stock, and Series A Preferred Stock are insufficient to permit the payment to such holders of the full amounts specified above, then the entire assets of the Company legally available for distribution shall be distributed with equal priority and pro rata among the holders of the Series C Preferred Stock, Series B Preferred Stock, and Series A Preferred Stock in to the full amounts they would otherwise be entitled to receive.

Dividend Provisions

The holders of outstanding shares of Series C Preferred Stock, Series B Preferred Stock, Series A Preferred Stock and Series A-1 Preferred Stock shall be entitled to receive dividends, when, as and if declared by the Board of Directors, out of any assets at the time legally available therefore, in preference and priority to any declaration or payment of any distribution on Common Stock in such calendar year. The right to receive dividends on shares of preferred stock are not cumulative, and no right to dividends accrue to holders of preferred stock by reason of the fact that dividends on said shares are not declared or paid. As of December 31, 2019, there were no cumulative dividends owed or in arrears.

Conversion Rights

Each outstanding share of Series C Preferred Stock, Series B Preferred Stock, Series A Preferred Stock, and Series A-1 Preferred Stock is convertible into such number of fully paid and non-assessable shares of Common Stock as is determined by dividing the Series C, Series B, Series A, and Series A-1 original issue price, as stated above, by the Series C, Series B, Series A, and Series A-1 conversion price of $8.2152, $4.19152, $1.06525, and $1.06525, respectively.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Each share of convertible preferred stock shall automatically be converted into fully paid and non-assessable shares of common stock immediately prior to the closing of a firm commitment underwritten public offering at a per share price of at least $9.75091 and in which the gross proceeds are not less than $90,000 or upon the receipt by the Company of a written request for such conversion from the holders of a majority of the Preferred Stock then outstanding (voting as a single class and on an as-converted to Common Stock basis). The conversion price of convertible preferred stock is subject to adjustment as a result of stock dividends, splits and other equity structuring transactions, and due to subsequent sales of common stock at a lower effective price.

Voting Rights

The holders of each share of convertible preferred stock are entitled to the number of votes equal to the number of shares of common stock into which such share is convertible.

Balance Sheet Classification

The Company's convertible preferred stock is classified outside of stockholders' deficit on the Consolidated Balance Sheet because the holders of such shares have liquidation rights in the event of a deemed liquidation that, in certain situations, are not solely within the control of the Company and would require the redemption of the then-outstanding convertible preferred stock. The convertible preferred stock is not redeemable, except in the event of a deemed liquidation event.

Note 7. Common stock

Each share of common stock entitles the holder to one vote on all matters submitted to a vote of the Company's stockholders. Common stockholders are entitled to receive dividends, as may be declared by the Company's board of directors. As of December 31, 2019, no dividends had been declared.

As of December 31, 2019, there were 100,000,000 shares of common stock authorized, of which 14,425,074 shares were outstanding, respectively.

Additionally, the Company has reserved the following shares of common stock for issuance as follows:

	December 31, 2019
Conversion of Series A preferred stock	19,977,170
Conversion of Series A-1 preferred stock	3,317,014
Conversion of Series B preferred stock	14,326,532
Conversion of Series C preferred stock	24,000,000
Conversion of Series A Warrants	75,098
Conversion of Series B Warrants	17,175
2016 Equity Incentive Plan	9,818,483
Key Personnel Incentive Plan	898,711
Total shares of common stock reserved for issuance	72,430,183

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Note 8. Share-based Compensation

Stock Options

Key Personnel Incentive Plan

In November 2013, the Company adopted the Key Personnel Incentive Plan, or the KPI Plan, and reserved 3,000,000 common units of the Company for sale and issuance under the KPI Plan. The KPI Plan provides for the grant of restricted units and non-statutory option awards to employees, non-employee directors and consultants of the Company. As of December 31, 2019, options to purchase a total of 898,711 shares of common stock remained outstanding under the KPI Plan. As of December 31, 2019, there were no shares of common stock available for grant under the KPI Plan.

The KPI Plan provides for the early exercise of options. Upon exercise, such option holder receives common stock of the Company, subject to a lapsing right of repurchase. Upon termination of such individual, the Company may exercise its right to repurchase any unvested shares for the exercise price paid by the option holder.

2016 Equity Incentive Plan

In August 2016, the Board of Directors and the stockholders of the Company adopted the 2016 Equity Incentive Plan. Options to purchase a total of 9,999,077 shares of common stock were reserved under the 2016 Plan. Under the 2016 Plan, the Company may grant options to purchase common stock, stock appreciation rights, restricted stock awards and other forms of stock-based compensation. Stock options generally vest over four years and expire no later than 10 years from the date of grant. The Board of Directors has the authority to select the employees to whom options are granted and determine the terms of each option, including i) the number of shares of common stock subject to the option; ii) when the option becomes exercisable; iii) the option exercise price, which must be at least 100% of the fair market value of the common stock as of the date of grant and iv) the duration of the option, which may not exceed 10 years.

As of December 31, 2019, options to purchase a total of 5,785,079 shares of common stock remained outstanding and 4,932,115 remain available for grant under the 2016 Plan and the KPI Plan.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Stock option activity for the year ended December 31, 2019 was as follows:

	Shares Subject to Options Outstanding	Weighted-Average Grant Date Fair Value	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Life (In Years)	Aggregate Intrinsic Value
Outstanding January 1, 2019	4,632,804	$ 0.57	$ 0.94	8.39	$ 11,064
Granted	1,775,000	2.01	3.33	9.52	
Cancelled	(502,965)	1.00	1.73	8.37	
Exercised	(119,760)	0.30	0.55	6.81	333
Outstanding December 31, 2019	5,785,079	$ 0.97	$ 1.62	7.92	$ 9,910
Vested and exercisable at December 31, 2019	2,890,585	$ 0.51	$ 0.82	6.98	$ 7,243
Non-vested options at January 1, 2019	2,790,941	$ 0.71	$ 1.19	8.94	$ 1,027
Non-vested options at December 31, 2019	2,894,494	$ 1.44	$ 2.41	8.86	$ 2,667

The fair value of options granted to employees is estimated on the grant date using the Black-Scholes option valuation model. This valuation model for stock-based compensation expense requires the Company to make assumptions and judgments about the variables used in the calculation, including the expected term (weighted-average period of time that the options granted are expected to be outstanding), the volatility of the Company's common stock, an assumed risk-free interest rate and expected dividends. The Company uses the simplified calculation of expected life and volatility is based on an average of the historical volatilities of the common stock of several publicly traded entities with characteristics similar to those of the Company. The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant for periods corresponding with the expected life of the option. The Company uses the straight-line method for expense attribution.

The following weighted-average assumptions were used to calculate the grant-date fair value of employee stock options:

	Year Ended December 31, 2019
Expected Term (in years)	6.17
Expected Volatility	63.88 - 65.01%
Expected Dividend Yield	—
Risk-Free Interest Rate	1.68 - 2.44%

During the year ended December 31, 2017, the Company granted options to purchase 220,000 shares of common stock to non-employee consultants. These options were granted in exchange for consulting services rendered and vested over the service term, which approximates the options' vesting period. The fair value of each option on the date of grant is estimated using the Black-Scholes option model. The fair value of these options is remeasured on each measurement date until they are fully vested. There were no grants to non-employee consultants during the year ended December 31, 2019.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

The following table presents classification of stock-based compensation expense for employees and non-employees within the Consolidated Statement of Operations and Comprehensive Loss:

	Year Ended December 31, 2019
Research and development	$ 915
General and administrative	470
Total	$ 1,385

At December 31, 2019, there was $3,704 of unamortized stock-based compensation cost related to unvested stock options which is expected to be recognized over a weighted average period of 2.83 years.

Warrants

In connection with the execution of the December 2016 Pacific loan agreement (see Note 5, “Note Payable”), the Company issued Pacific fully vested warrants to purchase 56,324 shares, or the 2016 Warrant, of Series A Preferred Stock at a purchase price of $1.06525 per share, exercisable through December 2026. In May 2017, the Company drew down the remaining $1,000 of additional borrowing capacity under the Pacific loan agreement, which obligated the Company to issue Pacific fully vested warrants to purchase 18,774 shares, or the 2017 Warrant, of Series A Stock at a purchase price of $1.06525 per share, exercisable through December 2026. The warrants issued to Pacific, which remained outstanding as of December 31, 2019, are immediately exercisable, with the number of shares to be issued upon settlement of the warrants to be 75,098.

In July of 2018, the Company elected to draw the remaining $7,200 available under the amended agreement. In connection with this draw the Company issued Pacific fully vested warrants to purchase 17,175 shares of Series B Preferred Stock at a purchase price of $4.1952 per share. These warrants remained outstanding as of December 31, 2019, and all were immediately exercisable. The number of shares to be issued upon settlement of the warrants is 17,175.

The following table summarizes the warrants outstanding as of December 31, 2019:

Series A	Grant Date	Number of Warrants	Exercise Price	Fair Value as of December 31, 2019
2016 Warrants	12/19/2016	56,324	$ 1.06525	$ 60
2017 Warrants	5/27/2017	18,774	$ 1.06525	$ 20

Series B	Grant Date	Number of Warrants	Exercise Price	Fair Value as of December 31, 2019
2018 Warrants	7/9/2018	17,175	$ 4.1915	$ 48

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

The fair value of warrants issued were calculated using the Black-Scholes-Merton option-pricing model with the following assumptions:

	December 31, 2019
Expected term (in years)	6.97 - 8.14
Expected Volatility	64.65%
Expected Dividend Yield	—
Risk-Free Interest Rate	1.92%

The FASB has issued accounting guidance on the classification of freestanding warrants and other similar instruments on shares that are redeemable (either puttable or mandatorily redeemable). The guidance requires liability classification for certain warrants issued that are exercisable into convertible preferred stock. The initial fair values of the warrants were recorded as a direct deduction to the carrying value of the notes payable and are being amortized over the term of the loan. The Company remeasures the warrants on each balance sheet date. The change in the valuation is recorded as Gain on remeasurement of fair value of warrants on the Consolidated Statement of Operations and Comprehensive Loss. As of December 31, 2019, the fair value of warrants outstanding was $128.

The following is a summary of the changes in the Company's warrant liability balance for the year ended December 31, 2019:

January 1, 2019	$139
Net decrease in fair value of all warrants	(11)
December 31, 2019	$128

Note 9. Commitments and Contingencies

Lease Obligations

Komas Lease

In August 2016, the Company entered a new facilities lease, with the right of use and payments beginning in January 2017. The term of the lease is 7 years. This lease includes provisions for escalating rent payments. Rent expense is recognized on a straight-line basis over the term of the lease. This lease included an allowance for tenant improvements. Tenant improvements were recorded as property and equipment and are being depreciated over the term of the lease. In conjunction with the allowance for tenant improvements, the Company recorded a lease incentive obligation of $847 which is being amortized over the term of the lease as a reduction to rent expense. As of December 31, 2019, the related unamortized lease incentive obligation was $494.

Station 41 Lease

In August 2017, the Company entered a new facilities lease, with the right of use beginning in December 2017 and payments beginning in June 2018. The term of the lease is 10 years, with one five-year renewal option exercisable by the Company. This lease includes provisions for escalating rent payments. Rent expense is recognized straight-line over the term of the lease. This lease included an

allowance for tenant improvements of $3,967, the full balance of which was drawn at year end. Tenant improvements are being recorded as property and equipment and will be depreciated over the remaining term of the lease when they are completed. In conjunction with the allowance for tenant improvements, the Company recorded a leasehold obligation of $3,967, which is being amortized over the term of the lease as a reduction to rent expense. As of December 31, 2019, the related unamortized lease incentive obligation was $3,180.

During the year ended December 31, 2018, the Company elected to draw an additional tenant improvement loan of $992 offered in the Station 41 lease. This loan is incorporated into, and acts to increase, the base rent over the remaining life of the lease. The increase in rent includes a charge for interest, interest accrues on the principal amount outstanding at a rate equal to 8%. The Company accounts for this additional tenant improvement loan as a Note Payable on the Consolidated Balance Sheet with the current portion being included in Current Portion of Notes Payable. The Company sent written notice to the lessor of its intent to draw the additional allowance during 2018. The Company finished collecting cash related to the allowance in May 2019.

During the year ended December 31, 2019, the Company amended the Station 41 Lease to include additional space in the conjoining unit with the right to use the new space beginning in June 2020 for an additional 7 years. This amendment for the extra space includes provisions for escalating rent payments. Rent expense is recognized straight-line over the term of the lease.

On January 22, 2021, the Company amended the Station 41 Lease, increasing the leased square footage by an additional 91,478 square feet. This amendment includes provisions for escalating rent, has a 10 year term and additional total minimum payments of $33,920.

Milpitas Lease

In August 2019, the Company entered a new facilities lease, with the right of use and payments beginning in August 2019. The term of the lease is 9 years. This lease includes provisions for escalating rent payments. Rent expense is recognized on a straight-line basis over the term of the lease.

Future Minimum Lease Payments

During the year ended December 31, 2019, total rent expense was $3,739. The Komas, Milpitas and Station 41 leases are classified as operating leases. Future minimum commitments as of December 31, 2019 under the Company's lease agreements are as follows:

Year Ended December 31,	Amount
2020	$ 3,688
2021	3,865
2022	3,980
2023	4,316
2024	4,252
Thereafter	15,187
Total Minimum Payments	$35,288

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Contract Obligations

In the normal course of business, the Company enters into contracts with clinical research organizations, drug manufacturers and other vendors for preclinical and clinical research studies, research and development supplies and other services and products for operating purposes. These contracts generally provide for termination on notice, and therefore are cancellable contracts.

Additionally, during the year ended December 31, 2020, the Company has agreed with Dell EMC to purchase an additional supercomputer, accessories and parts for an estimated price of approximately $18,637.

Indemnification

The Company has agreed to indemnify its officers and directors for certain events or occurrences, while the officer or director is or was serving at the Company's request in such capacity. The Company purchases directors and officers liability insurance coverage that provides for corporate reimbursements of covered obligations that limits the Company's exposure and enables it to recover a portion of potential future amounts paid. The Company has no liabilities recorded for these agreements as of December 31, 2019 as no amounts in excess of insurance coverage are probable or estimable.

Employee Agreements

The Company has signed employment agreements with certain key employees pursuant to which if their employment is terminated by the Company following a change of control of the Company, the employees are entitled to receive certain benefits, including accelerated vesting of equity incentives.

Legal Matters

The Company is not currently a party to any material litigation or other material legal proceedings. The Company may, from time to time, be involved in various legal proceedings arising from the normal course of business activities, and an unfavorable resolution of any of these matters could materially affect the Company's future results of operations, cash flows, or financial position.

Note 10. Income Taxes

The Company did not record any income tax expense for the year ended December 31, 2019. The Company has historically incurred operating losses and maintains a full valuation allowance against its net deferred tax assets.

The provision for income taxes consisted of the following components (all deferred):

	Year Ended December 31, 2019
Federal	$ 15,555
State	1,517
Change in valuation allowance	(17,072)
Total	$ —

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

The Company's effective tax rate of 0% for the year ended December 31, 2019 differs from the statutory U.S. federal rate as follows;

	Year Ended December 31, 2019
Statutory tax rate	$ (12,995)
R&D credit generation	(2,233)
Orphan drug credit generation	(932)
Uncertain Tax Positions	316
Other non-deductible expenses	288
Change in valuation allowance	15,556
Effective tax rate	$ —

The tax effects of temporary differences that give rise to significant components of the deferred tax assets are as follows:

	December 31, 2019
Deferred tax assets:	
Reserves and accruals	$ 1,846
Net operating loss carryforwards	27,665
Stock-based compensation	178
Research and development credit carryforwards	5,343
Definite Lived Intangibles	423
Other	31
Gross deferred tax assets	35,486
Valuation allowance	(33,786)
Net deferred tax asset	1,700
Deferred tax liabilities	
Depreciable assets	(1,700)
Net deferred tax asset	$ —

As of December 31, 2019, the Company recorded the portion of its deferred tax assets that was determined to meet the more likely than not threshold. A valuation allowance was recorded against the remaining deferred tax assets. Significant judgment is required in determining the Company's provision for income taxes, recording valuation allowances against deferred tax assets and evaluating the Company's uncertain tax positions. Due to net losses since inception and the uncertainty of realizing the deferred tax assets, the Company has a full valuation allowance against its net deferred tax assets. To the extent that the Company generates positive income and expects, with reasonable certainty, to continue to generate positive income, the Company may release all, or a portion of, the valuation allowance in a future period. This release would result in the recognition of all, or a portion of, the Company's deferred tax assets, resulting in a decrease to income tax expense for the period such release is made. As of December 31, 2019, the Company recorded a valuation allowance of $33,786, which increased by approximately $17,072 for the year ended December 31, 2019.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

NOLs and tax credit carry-forwards are subject to review and possible adjustment by the Internal Revenue Service ("IRS") and may become subject to annual limitation due to ownership changes that have occurred previously or that could occur in the future under Section 382 of the Internal Revenue Code, as amended and similar state provisions. These ownership changes may limit the amount of carryforwards that can be utilized annually to offset future taxable income. In general, an ownership change, as defined by Section 382, results from transactions increasing the ownership of certain shareholders or public groups in the stock of a corporation by more than 50% over a three-year period. The Company has not conducted a study to assess whether a change of control has occurred or whether there have been multiple changes of control since inception due to the significant complexity and cost associated with such a study. If the Company has experienced a change of control, as defined by Section 382, at any time since inception, utilization of the net operating loss carryforwards or research and development tax credit carryforwards would be subject to an annual limitation under Section 382, which is determined by first multiplying the value of the Company's stock at the time of the ownership change by the applicable long-term tax-exempt rate, and then could be subject to additional adjustments, as required. Any limitation may result in expiration of a portion of the net operating loss carryforwards or research and development tax credit carryforwards before utilization. Further, until a study is completed and any limitation is known, no amounts are being presented as an uncertain tax position.

As of December 31, 2019, the Company had federal NOL carryforwards of $116,575 available to reduce taxable income, of which $18,614 expire beginning 2036 and $97,961 do not expire. The Company had state NOL carryforwards of $117,771 as of December 31, 2019 available to reduce future state taxable income, of which $19,810 expire beginning 2031 and $97,961 do not expire.

As of December 31, 2019, the Company also had federal and state research and development credit carryforwards of $3,846 and $1,242, respectively. The federal research and development credit carryforwards expire beginning in 2036 and the state credit carryforwards expire beginning in 2030. The Company also had federal Orphan Drug credits of $932 as of December 31, 2019, which will begin expiring in 2036. The Company had reserves for uncertain tax positions against these credit carryforward of $677 as of December 31, 2019.

The Company recognizes benefits of uncertain tax positions if it is more likely than not that such positions will be sustained upon examination based solely on their technical merits, as the largest amount of benefit that is more likely than not to be realized upon the ultimate settlement. It is the Company's policy to include penalties and interest expense related to income taxes as a component of Other Income, net as necessary.

The Company files income tax returns in the United States, Utah, and California. The Company is not currently under examination in either of these jurisdictions. The Company is subject to income tax examinations on all returns since the 2016 tax return.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Note 11. Net Loss Per Share

The following table sets forth the computation of the basic and diluted net loss per share:

	Year Ended December 31, 2019
Numerator:	
Net loss	$ (61,879)
Denominator:	
Weighted average common shares outstanding	14,380,177
Net loss per share, basic and diluted	$ (4.30)

The Company's potentially dilutive securities, which include convertible preferred stock and options and warrants to purchase common stock, have been excluded from the computation of diluted net loss per share as the effect would be to reduce the net loss per share. Therefore, the weighted average number of common shares outstanding used to calculate both basic and diluted net loss per share is the same. The Company excluded the following potential common shares from the computation of diluted net loss per share for the periods indicated because including them would have had an anti-dilutive effect:

	Year Ended December 31, 2019
Convertible preferred stock	52,466,330
Options to purchase common stock	5,785,079
Warrants	92,273
Total	58,362,848

Note 12. Related Party Note Receivable

On December 5, 2017, the Company entered into a loan agreement with its Chief Executive Officer, or the CEO, to provide to the CEO a loan of $595. The loan had a seven-year term. As of December 31, 2019, the outstanding balance of $595 is recorded on the Consolidated Balance Sheet within Other Non-Current assets. The outstanding balance of the loan was fully repaid during the year ended December 31, 2020.

Note 13. Collaborative and Other Research and Development Contracts

On October 10, 2017, the Company announced the formation of a research collaboration with Takeda Pharmaceutical Company Limited. Under the terms of this collaboration, Recursion will utilize its discovery platform to provide pre-clinical candidates for Takeda's TAK-celerator™ development pipeline. Financial terms of the agreement include an upfront payment and success-based milestones of over $90,000 and should the collaboration result in multiple new drug approvals, single digit royalty payments on net sales. During 2018, Takeda exercised options enabling it to continue development of drug compounds on two indications identified through the collaboration. In 2019, the Company recognized $1,334 of revenue resulting from the collaboration.

RECURSION PHARMACEUTICALS, INC.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

Note 14. Employee Benefit Plans

The Company has an employee benefit plan under Section 401(k) of the Internal Revenue Code. The plan allows employees to make contributions up to a specified percentage of their compensation. The Company is currently contributing up to 4% of employee base salary, by matching 100% of the first 4% of annual base salary contributed by each employee. Employer expenses were approximately $931 during the year ended December 31, 2019.

Note 15. Subsequent Events

The Company evaluated subsequent events from the balance sheet date through January 26, 2021, the date at which the consolidated financial statements were issued. The Company has concluded that no events or transactions have occurred, other than those disclosed in the notes above, that require disclosure in the accompanying consolidated financial statements, other than the following:

(a) Impact of COVID-19

In March 2020, the World Health Organization declared the outbreak of novel coronavirus disease, or COVID-19, as a pandemic. COVID-19 has caused market volatility and uncertainty around the world in various industries. While there remains uncertainty as to the severity, duration, and extent of the effect of the COVID-19 pandemic, the Company does not currently anticipate impact as a result of the COVID-19 pandemic on the Company's operations and financial position. The Company is continuing to proactively monitor and assess the potential impact on our business that may result from this rapidly evolving crisis and to avoid any unnecessary potential delays to our programs. At this time, our lead programs and research activities remain on track. The safety and well-being of employees, patients and partners is our highest priority.

(b) Asset Purchase Agreement for Vium, Inc.

In July 2020, the Company entered into an asset purchase agreement to purchase 100% of the assets of Vium, Inc. for a total cash consideration of $2,600.

(c) Bayer Collaboration Agreement

In August 2020, the Company entered into a strategic partnership agreement with Bayer AG, or Bayer. Under the terms of the agreement, the Company received an upfront payment of $30,000. Additionally, the Company and Bayer may initiate more than ten programs with possible development and commercial milestone payments to the Company of $100,000 per program plus royalties on future sales. Bayer will gain the option to exclusively license novel therapeutics derived from the research activities.

(d) Issuance of options

During the year ended December 31, 2020, the Company granted 8,884,057 additional options.

Shares

Recursion Pharmaceuticals, Inc.

Common Stock

Joint Bookrunners

Goldman Sachs & Co. LLC **J.P. Morgan**

BofA Securities **SVB Leerink** **Allen & Company LLC**

Passive Bookrunner

KeyBanc Capital Markets

Prospectus dated , 2021

Table of Contents

Decoding Biology to Radically Improve Lives

Proud founding member of biohive™

PART II
INFORMATION NOT REQUIRED IN THE PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution

The following table sets forth the expenses to be incurred in connection with the offering described in this Registration Statement, other than underwriting discounts and commissions, all of which will be paid by us. All amounts are estimates except the Securities and Exchange Commission, or SEC, registration fee, the Financial Industry Regulatory Authority, Inc., or FINRA, filing fee and the Nasdaq listing fee.

	Amount Paid or to Be Paid
SEC registration fee	$ *
FINRA filing fee	*
Nasdaq listing fee	*
Printing and engraving expenses	*
Legal fees and expenses	*
Accounting fees and expenses	*
Transfer agent and registrar fees	*
Miscellaneous expenses	*
Total	$ *

* To be provided by amendment.

Item 14. Indemnification of Directors and Officers

Section 145 of the Delaware General Corporation Law empowers a corporation to indemnify its directors and officers and to purchase insurance with respect to liability arising out of their capacity or status as directors and officers, provided that the person acted in good faith and in a manner the person reasonably believed to be in our best interests, and, with respect to any criminal action, had no reasonable cause to believe the person's actions were unlawful. The Delaware General Corporation Law further provides that the indemnification permitted thereunder shall not be deemed exclusive of any other rights to which the directors and officers may be entitled under the corporation's bylaws, any agreement, a vote of stockholders or otherwise. The certificate of incorporation of the registrant to be in effect upon the completion of this offering provides for the indemnification of the registrant's directors and officers to the fullest extent permitted under the Delaware General Corporation Law. In addition, the bylaws of the registrant to be in effect upon the completion of this offering require the registrant to fully indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding (whether civil, criminal, administrative or investigative) by reason of the fact that such person is or was a director or officer of the registrant, or is or was a director or officer of the registrant serving at the registrant's request as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorney's fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding, to the fullest extent permitted by applicable law.

Section 102(b)(7) of the Delaware General Corporation Law permits a corporation to provide in its certificate of incorporation that a director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, except (1) for any breach of the director's duty of loyalty to the corporation or its stockholders, (2) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (3) for

payments of unlawful dividends or unlawful stock repurchases or redemptions or (4) for any transaction from which the director derived an improper personal benefit. The registrant's certificate of incorporation to be in effect upon the completion of this offering provides that the registrant's directors shall not be personally liable to it or its stockholders for monetary damages for breach of fiduciary duty as a director and that if the Delaware General Corporation Law is amended to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of the registrant's directors shall be eliminated or limited to the fullest extent permitted by the Delaware General Corporation Law, as so amended.

Section 174 of the Delaware General Corporation Law provides, among other things, that a director who willfully or negligently approves of an unlawful payment of dividends or an unlawful stock purchase or redemption may be held liable for such actions. A director who was either absent when the unlawful actions were approved, or dissented at the time, may avoid liability by causing his or her dissent to such actions to be entered in the books containing minutes of the meetings of the board of directors at the time such action occurred or immediately after such absent director receives notice of the unlawful acts.

As permitted by the Delaware General Corporation Law, the registrant has entered into separate indemnification agreements with each of the registrant's directors and executive officers which would require the registrant, among other things, to indemnify them against certain liabilities which may arise by reason of their status as directors or executive officers.

The registrant expects to obtain and maintain insurance policies under which its directors and officers are insured, within the limits and subject to the limitations of those policies, against certain expenses in connection with the defense of, and certain liabilities which might be imposed as a result of, actions, suits, or proceedings to which they are parties by reason of being or having been directors or officers. The coverage provided by these policies may apply whether or not the registrant would have the power to indemnify such person against such liability under the provisions of the Delaware General Corporation Law.

These indemnification provisions and the indemnification agreements entered into between the registrant and the registrant's officers and directors may be sufficiently broad to permit indemnification of the registrant's officers and directors for liabilities (including reimbursement of expenses incurred) arising under the Securities Act of 1933, as amended.

The underwriting agreement between the registrant and the underwriters filed as Exhibit 1.1 to this registration statement provides for the indemnification by the underwriters of the registrant's directors and officers and certain controlling persons against specified liabilities, including liabilities under the Securities Act with respect to information provided by the underwriters specifically for inclusion in the registration statement. The investors' rights agreement with certain holders of our capital stock also provides for cross-indemnification in connection with the registration of the registrant's common stock on behalf of such holders.

Item 15. Recent Sales of Unregistered Securities

The following list sets forth information regarding all unregistered securities sold by us since January 1, 2017. No underwriters were involved in the sales and the certificates representing the securities sold and issued contain legends restricting transfer of the securities without registration under the Securities Act or an applicable exemption from registration.

(1) From September 2017 through February 2018, we issued and sold an aggregate of 14,314,610 shares of our Series B convertible preferred stock at a purchase price of $4.19152 per share for an aggregate purchase price of $60.0 million.

(2) From February 2019 through August 2019, we issued and sold an aggregate of 12,517,569 shares of our Series C convertible preferred stock at a purchase price of $9.75091 per share for an aggregate purchase price of $122.1 million.

(3) From September 2020 through October 2020, we issued and sold an aggregate of 24,599,042 shares of our Series D convertible preferred stock at a purchase price of $10.06181 per share for an aggregate purchase price of $247.5 million.

(4) From January 2017 through December 31, 2020, we granted stock options to purchase an aggregate of shares of common stock upon the exercise of options under our 2016 Plan at exercise prices per share ranging from $ to $, for an aggregate exercise price of approximately $.

(5) From January 2017 through December 31, 2020, we issued and sold to certain service providers of ours an aggregate of shares of common stock upon the exercise of options under our 2016 Plan at exercise prices per share ranging from $ to $, for an aggregate exercise price of approximately $.

The offers, sales and issuances of the securities described in Items 15(1), 15(2) and 15(3) were exempt from registration under the Securities Act under Section 4(a)(2) of the Securities Act or Regulation D promulgated thereunder as transactions by an issuer not involving a public offering. The recipients of securities in each of these transactions acquired the securities for investment only and not with a view to or for sale in connection with any distribution thereof and appropriate legends were affixed to the securities issued in these transactions. Each of the recipients of securities in these transactions was an accredited person and had adequate access, through employment, business, or other relationships, to information about the registrant.

The offers, sales and issuances of the securities described in Items 15(4) and 15(5) were exempt from registration under the Securities Act under either (1) Rule 701 in that the transactions were under compensatory benefit plans and contracts relating to compensation as provided under Rule 701 or (2) Section 4(a)(2) of the Securities Act as transactions by an issuer not involving any public offering. The recipients of such securities were the registrant's employees, consultants or directors and received the securities under our 2016 Plan. The recipients of securities in each of these transactions represented their intention to acquire the securities for investment only and not with view to or for sale in connection with any distribution thereof and appropriate legends were affixed to the securities issued in these transactions.

Item 16. Exhibit and Financial Statement Schedules

(a) Exhibits.

See the Exhibit Index immediately preceding the signature page hereto for a list of exhibits filed as part of this registration statement on Form S-1, which Exhibit Index is incorporated herein by reference.

(b) Financial Statement Schedules.

Schedules have been omitted because the information required to be set forth therein is not applicable or is shown in the financial statements or notes thereto.

Item 17. Undertakings

The undersigned registrant hereby undertakes to provide to the underwriters at the closing specified in the underwriting agreements, certificates in such denominations and registered in such names as required by the underwriters to permit prompt delivery to each purchaser.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit, or proceeding) is asserted by such director, officer, or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

The undersigned hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act of 1933 shall be deemed to be part of this registration statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

EXHIBIT INDEX

Exhibit number	Description
1.1*	Form of Underwriting Agreement.
3.1*	Amended and Restated Certificate of Incorporation of the Registrant, as currently in effect.
3.2*	Form of Amended and Restated Certificate of Incorporation of the Registrant, to be in effect upon the completion of this offering.
3.3*	Bylaws of the Registrant, as currently in effect.
3.4*	Form of Amended and Restated Bylaws of the Registrant, to be in effect upon the completion of this offering.
4.1*	Amended and Restated Investors' Rights Agreement by and among the Registrant and certain of its stockholders, dated September 1, 2020.
4.2*	Specimen common stock certificate of the Registrant.
5.1*	Opinion of Wilson Sonsini Goodrich & Rosati, Professional Corporation.
10.1+*	Form of Indemnification Agreement between the Registrant and each of its directors and executive officers.
10.2+*	2016 Equity Incentive Plan, as amended, and forms of agreement thereunder.
10.3+*	2021 Equity Incentive Plan and forms of agreements thereunder, to be in effect upon the completion of this offering.
10.4+*	2021 Employee Stock Purchase Plan and forms of agreements thereunder, to be in effect upon the completion of this offering.
10.5+*	Form of Executive Officer Employment Agreement between the Registrant and each executive officer.
10.9+*	Executive Incentive Compensation Plan.
10.10+*	Change in Control and Severance Policy.
10.11+*	Outside Director Compensation Policy.
10.12*	Office Lease by and between Vestar Gateway, LLC and Registrant, dated November 13, 2017, as amended.
10.13*	Amended and Restated Lease by and between Berrueta Family L.P. and Mousera, Inc. dated July 27, 2015, as amended and assigned to Registrant on August 16, 2019.
10.14*	Research Collaboration and Option Agreement by and between Bayer AG and the Registrant, dated August 28, 2020.
10.15*	Amended and Restated License Agreement between the Registrant and University of Utah Research Foundation, dated February 9, 2016.
10.16*	Exclusive License Agreement No. A2019-1229 between Ohio State Innovation Foundation and Registrant, dated December 21, 2018.
10.17*	License Agreement by and between Takeda Pharmaceutical Company Limited and Registrant, dated May 1, 2020.
23.1*	Consent of Independent Registered Public Accounting Firm.
23.2*	Consent of Wilson Sonsini Goodrich & Rosati, Professional Corporation (included in Exhibit 5.1).
24.1*	Power of Attorney (see page II-6 to this Form S-1).

* To be filed by amendment.
\+ Indicated management contract or compensatory plan.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Salt Lake City, Utah, on , 2021.

RECURSION PHARMACEUTICALS, INC.

By: _____
Christopher Gibson
Chief Executive Officer

Power of Attorney

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Christopher Gibson and Michael Secora as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and substitution, for him or her and in his or her name, place and stead, in any and all capacities to sign any or all amendments (including post-effective amendments) to this registration statement and any and all additional registration statements pursuant to Rule 462(b) of the Securities Act of 1933, as amended, and to file the same, with all exhibits thereto, and all 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 and about the premises, as fully to all intents and purposes as they, he or she might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agents or any of them, or their, his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
Christopher Gibson	President, Chief Executive Officer and Director *(Principal Executive Officer)*	, 2021
Michael Secora	Chief Financial Officer *(Principal Financial and Accounting Officer)*	, 2021
Zachary Bogue	Director	, 2021
Blake Borgeson	Director	, 2021
Terry-Ann Burrell	Director	, 2021

Signature	Title	Date
R. Martin Chavez	Director	, 2021
Zavain Dar	Director	, 2021
Robert Hershberg	Director	, 2021
Dean Li	Director	, 2021