Jaguar Health, Inc.
Form 10-K
April 10, 2019
Table of Contents

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, DC 20549

Form 10-K

(Mark One)

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

For the fiscal year ended December 31, 2018

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

For the transition period from to

COMMISSION FILE NO. 001-36714

JAGUAR HEALTH, INC.

(Exact name of registrant as specified in its charter)

Delaware	46 2956775
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

201 Mission Street, Suite 2375

San Francisco, California 94105

(Address of principal executive offices)

Registrant's telephone number, including area code:

(415) 371 8300

SECURITIES REGISTERED PURSUANT TO SECTION 12(b) OF THE ACT:

Title of each class	Name of each exchange on which registered
Common Stock, Par Value $0.0001 Per Share	The NASDAQ Capital Market

SECURITIES REGISTERED PURSUANT TO SECTION 12(g) OF THE ACT: None

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

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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

Large accelerated filer	Accelerated filer	Non-accelerated filer	Smaller reporting company Emerging growth company

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

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

As of June 30, 2018, the aggregate market value of the registrant's common stock held by non-affiliates was approximately $12,405,942 based upon the closing sales price of the registrant's common stock on The NASDAQ Global Market on such date.

The number of shares of the registrant's Common Stock outstanding as of April 5 was 59,415,042 shares of voting common stock and 40,301,237 shares of non-voting common stock. The company also had 5,524,926 shares of convertible preferred stock outstanding (convertible into 33,149,556 shares of voting common stock, subject to certain voting restrictions as provided in the Certificate of Designation for the convertible preferred stock).

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the proxy statement for the registrant's 2019 Annual Meeting of Stockholders, or Proxy Statement, to be filed within 120 days of the end of the fiscal year ended December 31, 2018 are incorporated by reference in Part III hereof. Except with respect to information specifically incorporated by reference in this Form 10-K, the Proxy Statement is not deemed to be filed as a part hereof.

Table of Contents

TABLE OF CONTENTS

Table of Contents

PART I

Forward looking statements

This Form 10 K contains forward looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. All statements other than statements of historical facts contained in this Form 10 K, including statements regarding our future results of operations and financial position, business strategy, prospective products, product approvals, research and development costs, timing of receipt of clinical trial, field study and other study data, and likelihood of success, commercialization plans and timing, other plans and objectives of management for future operations, and future results of current and anticipated products are forward looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward looking statements.

In some cases, you can identify forward looking statements by terms such as “may,” “will,” “should,” “expect,” “plan,” “aim,” “anticipate,” “could,” “intend,” “target,” “project,” “contemplate,” “believe,” “estimate,” “predict,” “potential” or “continue” o of these terms or other similar expressions. The forward looking statements in this Form 10 K are only predictions. We have based these forward looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our business, financial condition and results of operations. These forward looking statements speak only as of the date of this Form 10 K and are subject to a number of risks, uncertainties and assumptions described under the sections in this Form 10 K titled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and elsewhere in this Form 10 K. Forward looking statements are subject to inherent risks and uncertainties, some of which cannot be predicted or quantified and some of which are beyond our control. 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. Moreover, we operate in a dynamic industry and economy. New risk factors and uncertainties may emerge from time to time, and it is not possible for management to predict all risk factors and uncertainties that we may face. Except as required by applicable law, we do not plan to publicly update or revise any forward looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise.

Jaguar Health, our logo, Canalevia and Neonorm are our trademarks that are used in this Form 10 K. This Form 10 K also includes trademarks, tradenames and service marks that are the property of other organizations. Solely for convenience, trademarks and tradenames referred to in this Form 10 K appear without the ©, ® or ™ symbols, but those references are not intended to indicate that we will not assert, to the fullest extent under applicable law, our rights or that the applicable owner will not assert its rights, to these trademarks and tradenames.

ITEM 1. BUSINESS

BUSINESS

Overview

We are a commercial stage natural products pharmaceuticals company focused on developing novel, sustainably derived gastrointestinal products on a global basis. Our wholly owned subsidiary, Napo Pharmaceuticals, Inc. (“Napo”), focuses on developing and commercializing proprietary human gastrointestinal pharmaceuticals for the global marketplace from plants used traditionally in rainforest areas. Our Mytesi (crofelemer) product is approved by the

U.S. Food and Drug Administration ("FDA") for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy.

Jaguar was founded in San Francisco, California as a Delaware corporation on June 6, 2013. Napo formed Jaguar to develop and commercialize animal health products. Effective as of December 31, 2013, Jaguar was a wholly owned subsidiary of Napo, and, until May 13, 2015, Jaguar was a majority owned subsidiary of Napo. On

Table of Contents

July 31, 2017, the merger of Jaguar Animal Health, Inc. and Napo became effective, at which point Jaguar Animal Health's name changed to Jaguar Health, Inc. and Napo began operating as a wholly owned subsidiary of Jaguar focused on human health and the ongoing commercialization of, and development of follow on indications for Mytesi. Most of the activities of the Company are now focused on the commercialization of Mytesi and development of follow-on indications for crofelemer and a second-generation anti-secretory product, lechlemer. In the field of animal health, we have limited activities which are focused on developing and commercializing first in class gastrointestinal products for dogs, dairy calves, foals, and high value horses.

We believe Jaguar is poised to realize a number of synergistic, value adding benefits—and an expanded pipeline of potential blockbuster human follow on indications of crofelemer, and a second generation anti secretory agent--upon which to build global partnerships. As previously announced, Jaguar, through Napo, now holds extensive global rights for Mytesi, and crofelemer manufacturing is being conducted at two FDA-inspected and approved locations, including a new, multimillion dollar commercial manufacturing facility. Additionally, several of the drug product candidates in Jaguar's Mytesi pipeline are backed by strong Phase 2 evidence from completed Phase 2 trials.

Mytesi is a novel, first in class anti secretory agent which has a basic normalizing effect locally on the gut, and this mechanism of action has the potential to benefit multiple disorders. Mytesi is in development for multiple possible follow on indications, including diarrhea related to targeted cancer therapy; orphan drug indications for infants and children with congenital diarrheal disorders and short bowel syndrome (SBS); supportive care for inflammatory bowel disease (IBD); irritable bowel syndrome (IBS); and for idiopathic/functional diarrhea. In addition, a second generation proprietary anti secretory agent, lechlemer, is in development for cholera. Mytesi has received orphan drug designation for SBS.

Napo has a direct sales force of 16 sales representatives, a national sales director and one regional sales director covering U.S. geographies with the highest potential. In June 2018, we hired Robert J. Griffing, a seasoned industry veteran with a broad range of experience that includes commercializing supportive care and HIV treatments, as chief commercial officer for Napo. With support provided by concomitant marketing, promotional activities, patient empowerment programs and medical education initiatives described below, we expect continued growth in the number of patients treated with Mytesi.

The goal of Napo's internal sales team is to deliver a frequent and consistent selling message to targeted, high-volume prescribers of antiretroviral therapies (ART) and to gastroenterologists who see large numbers of HIV patients. In December 2017 we released the results of a survey of 350 people living with HIV and AIDS regarding the topic of "Talking to Your Doctor About Symptoms". The survey results show that diarrhea remains prevalent in those living with HIV/AIDS, as 27% of respondents living with HIV/AIDS reported that they currently have diarrhea, while 56% reported that they have had diarrhea in the past. Additionally, the results of a recent Napo-sponsored survey of 271 U.S. board certified gastroenterologists indicate that the number one GI complaint for people living with HIV/AIDS is diarrhea, and 93% of U.S. gastroenterologists see patients with HIV/AIDS in their practice.

Key to the success of our sales representatives in growing Mytesi sales is differentiating and targeting the right doctors—those HIV specialists who are high prescribers of ART medications and those gastrointestinal doctors who see large populations of people living with HIV/AIDS. The target list of prescribers for our sales reps includes a pool of approximately 3,100 high volume ART prescribing HIV specialists, and gastroenterologists who see the largest number of people living with HIV/AIDs, and we've strategically placed our sales force in the US geographies with the highest potential, including San Francisco, southern California, Arizona, Nevada, Miami/southern Florida, northern Florida, New York City/Long Island, Massachusetts, Rhode Island, New Hampshire, Connecticut, New Jersey, northern Texas, southern Texas, Chicago, Alabama, Mississippi, Louisiana, North Carolina/South Carolina, Michigan, Indianapolis, Ohio and Atlanta.

In June 2018, Napo entered into an agreement with RedHill Biopharma, a specialty biopharmaceutical company primarily focused on late clinical-stage development and commercialization of proprietary drugs for gastrointestinal diseases and cancer, to establish a U.S. co-promotion program for Mytesi.

Table of Contents

RedHill's specialized, GI-focused field sales force is promoting Mytesi to health care practitioners in 36 U.S. territories that contain significant numbers of HIV patients and health care practitioners that are not currently covered by Napo's field sales force. In these geographies, RedHill sales representatives target gastroenterologists who see large populations of people living with HIV, along with nurse practitioners and physician assistants. RedHill field representatives also target lower-level prescribers of anti-retroviral infectious disease specialists in regions currently covered by Napo's sales force. Four RedHill inside sales representatives actively target health care practitioners in other regions not covered by the Napo or RedHill field representatives. We believe this copromotion program will play an important role in extending the reach of our commercial efforts into the GI medical community in support of the treatment of people living with HIV (PLWH) with Mytesi. Under the terms of the Agreement, RedHill is compensated based on performance, and the program can be extended by agreement between the two companies , as it was in January 2019.

Medical education presentations led by health care practitioners (HCPs) participating in the Napo Speakers Bureau—a group that includes HIV/AIDS specialists, infectious disease specialists, gastroenterologists, colorectal surgeons, and nurse practitioners—focus on the prevalence and pathophysiology of gastrointestinal consequences of HIV infection and on the latest treatment options for HIV-related diarrhea. Presentations given by patient advocate members provide information to PLWH about the prevalence of diarrhea in PLWH and offer guidance about talking to HCPs regarding diarrhea-related concerns.

On July 24, 2018, we announced the results of an analysis conducted to examine whether the rate of HIV-associated diarrhea has changed over time. The analysis of data, sourced from the National Institutes of Health (NIH) clinicaltrials.gov database, revealed that 18% of HIV patients experience diarrhea and the rates have not declined significantly over time. The analysis includes data from 38 U.S. clinical trials from 2008-2016 in more than 21,000 patients. The results were reported at the International AIDS 2018 Conference (AIDS 2018) on Tuesday, July 24 in Amsterdam, Netherlands. The poster is available on the AIDS 2018 website at this link: https://programme.aids2018.org//PAGMaterial/eposters/4900.pdf.

With the introduction of newer antiretroviral (ARV) drug therapy, there has been a reduction in the severity of ARV-induced diarrhea. However, a significant portion of this patient population still suffers from diarrhea caused by HIV enteropathy, which is due to direct and indirect effects of HIV on the intestinal mucosa. Chronic diarrhea remains a significant complaint of people living with HIV/ AIDS, particularly those who are older and have lived with the virus in their gut for 10+ years. According to data from the U.S. Centers for Disease Control and Prevention, currently more than 50% of people living with HIV are over age 50; by 2020 this figure will increase to 70%.

Crofelemer (Mytesi) data from a supplemental analysis of the ADVENT trial was featured in a poster presentation at the 9th International Aids Society (IAS) Conference on HIV Science held in July 2017 in Paris, France. The presentation was titled Long-Term Crofelemer Use Gives Clinically Relevant Reductions in HIV-Related Diarrhea. IAS features the latest HIV science, including basic, clinical and prevention research, and brings together a broad cross section of HIV professionals from around the world with a focus on implementation—moving scientific advances into practice. The results indicate that at the end of the study period, more than 50% of the patients treated had complete resolution of their diarrhea; and 83% had at least a 50% reduction in diarrhea. Entry criteria required at least 7 watery stools in a week, and the average was 20 (with some patients having as high at 67 stools in a week).

Napo continues to pursue AIDS Drug Assistance Program (ADAP) formulary listing. ADAPs provide life-saving HIV treatments to low income, uninsured, and underinsured individuals living with HIV/AIDS in all 50 states and the territories. The ADAP program provides Mytesi free of charge to patients who qualify and copay support for some patients who have insurance coverage. In the third quarter of 2018, Mytesi was added to the ADAP formularies in New York, Tennessee, Mississippi and DC. As announced January 24, 2019, Mytesi has also been added to the formulary for Florida's ADAP, which is the third largest in the U.S. based on enrollment. As a result of this addition,

based on data from healthcare research firm Decision Resource Group, approximately 86% of ADAP-eligible US lives now have access to Mytesi, which is now on the ADAP formularies for 30 states, including the five programs with the largest enrollment.

Table of Contents

As we announced April 10, 2018, Napo has signed an agreement with the ADAP Crisis Task Force. The agreement establishes a reduced price provided by Napo ADAPs in all U.S. states and territories for purchases of Mytesi. Formed in 2002, the Task Force negotiates reduced drug prices for all ADAPs. Task Force membership is currently comprised of representatives from Arizona, California, Florida, Illinois, Massachusetts, New York, North Carolina, Tennessee, Texas, Virginia, and Washington state HIV/AIDS divisions. Per the terms of the agreement, all state ADAPs are guaranteed the same reduced price for the drug. ADAPs provide HIV-related services and approved medications to more than half a million people in the U.S. each year, and we expect this agreement to help further expand the number of patients able to benefit from the novel, first-in-class anti-secretory mechanism of action of Mytesi.

Mytesi is currently reimbursed by Medicaid in all 50 states. It is also currently covered on 100% of the top 10 commercial insurance plan national formularies, representing more than 245 million U.S. lives. Additionally, Napo operates a co-pay coupon program, which helps ensure that the majority of participating patients do not have a Mytesi co-pay greater than $25. Information about the NapoCares Patient Assistance Program, which assists patients with benefit verification, prior authorization, and claims appeals, can be found at mytesi.com/mytesi-savings.html.

Pipeline within a product—crofelemer

According to the World Health Organization, there are nearly 1.7 billion cases of diarrheal disease globally every year. Although not all types of diarrhea are secretory in nature, we view the current, initial approval of Mytesi as the opening of the door to an important pipeline—underscored by the current approval by the FDA of the Chemistry, Manufacturing and Controls (CMC) for this natural product, as well as acknowledgement by the FDA of the safety of the product for chronic use for the approved indication.

Crofelemer is in development for the symptomatic relief of cancer therapy-related diarrhea (CTD). A significant proportion of patients undergoing cancer therapy experience diarrhea. Novel targeted cancer therapy agents, such as epidermal growth factor receptor antibodies and tyrosine kinase inhibitors, with or without cycle chemotherapy agents, may activate intestinal chloride secretory pathways leading to increased chloride secretion into the gut lumen, coupled with significant loss of water, that would result in secretory diarrhea.

Our planned study for diarrhea related to CTD is analogous to the successful pivotal program we ran for Mytesi's currently approved HIV indication, and as part of risk mitigation we intend to use the same formulation and dosing as the current commercialized Mytesi. As part of Jaguar's near-term plan, Jaguar had a meeting with the FDA in March 2019 to discuss the anticipated protocol for a planned pivotal trial for the evaluation of crofelemer in CTD. The meeting, which included academic key opinion leaders (KOLs)/Napo Scientific Advisory Board members from leading oncology treatment institutions, resulted in a productive regulatory discussion about design refinements for the anticipated pivotal trial.

There are two ongoing investigator initiated trials (IITs) utilizing Mytesi to address CTD. Enrollment is ongoing for the HALT D study at Georgetown University in breast cancer patients on treatment with Herceptin, which is being funded by Genentech Roche, and interim results are expected to be read out in the first half of 2019. The second study, which is funded by Puma, is evaluating the use of crofelemer in subjects receiving neratinib, which has extremely high rates of diarrhea.

According to data appearing in "Treatment Guidelines for CID" (chemotherapy induced diarrhea) in the April 2004 issue of Gastroenterology and Endoscopy News, diarrhea is the most common adverse event reported in chemotherapy patients. Approved third party supportive care products for chemotherapy induced nausea and vomiting (CINV) include Sustol, Aloxi, Akynzeo and Sancuso. According to Transparency Market Research, sales of therapeutics for the prevention of CINV approximated $620 million in 2013, and sales of such therapeutics are expected to reach $1 billion in 2020.

Diarrhea has been reported as the most common side effect of the recently approved CDK 4/6 inhibitor abemaciclib and the pan HER TKI neratinib, with occurrence ranging from 86% to >95% and grade 3 over 40%, in published studies. Diarrhea in this patient population has the potential to cause dehydration, potential infections, and

Table of Contents

non adherence to treatment. A novel anti diarrheal like Mytesi may hold promise for treating secretory diarrhea—and therefore also support long term cancer treatment adherence—in this population.

As we announced on January 22, 2018, Napo has accepted a request for support submitted by Dr. Mohamad Miqdady, Chief of Pediatric Gastroenterology, Hepatology and Nutrition at Sheikh Khalifa Medical City (SKMC) in Abu Dhabi, for an investigator initiated trial of crofelemer, the active pharmaceutical ingredient in Mytesi, for congenital diarrheal disorders (CDDs) in children.

CDDs are a group of rare, chronic intestinal channel diseases, with onset in early infancy, that are characterized by severe, lifelong diarrhea and a lifelong need for nutritional intake either parenterally or with a feeding tube. CDDs are related to specific genetic defects inherited as autosomal recessive traits. The incidence of CDDs is prevalent in regions where consanguineous marriages (related by blood) is part of the culture. CDDs are directly associated with serious secondary conditions including dehydration, metabolic acidosis, and failure to thrive, prompting the need for immediate therapy to prevent death and limit lifelong disability.

SKMC is the Abu Dhabi public health system's flagship institution and the largest hospital in the United Arab Emirates (UAE), consisting of a 586 bed tertiary hospital, 14 outpatient specialty clinics, and the Abu Dhabi Blood Bank, all of which are accredited by Joint Commission International, the oldest and largest healthcare standards setting and accrediting body in the United States. Dr. Miqdady is an American Board certified in Pediatric Gastroenterology, Hepatology and Nutrition, and he is a member of Napo's Scientific Advisory Board.

Napo intends to submit documentation in the first half of 2019 to the U.S. FDA for the planned formulation of crofelemer appropriate for feeding tube administration to support this investigation.

As announced on June 5, 2017, Napo has received orphan drug designation from the FDA for pediatric short bowel syndrome (SBS). The Orphan Drug Act provides for granting special status to a drug or biological product to treat a rare disease or condition upon request of a sponsor. Orphan drug designation qualifies the sponsor of the drug for various development incentives, including extended exclusivity, tax credits for qualified clinical testing, and relief of filing fees.

Jaguar's and Napo's portfolio development strategy involves meeting with Key Opinion Leaders (KOLs) to identify indications that are potentially high value because they address important medical needs that are significantly or globally unmet, obtain input on protocol practicality and protocol generation, and then strategically sequencing indication development priorities, second generation product pipeline development, and partnering goals on a global basis, as well as identifying possible opportunities for a Special Protocol Assessment (SPA) from the FDA. When granted, SPA provides that, upon request, FDA will evaluate within 45 days certain protocols to assess whether they are adequate to meet scientific and regulatory requirements identified by the sponsor. In 2007, under the SPA process, Napo obtained agreement with the FDA for the design of the pivotal study protocol for the currently approved indication of crofelemer (Mytesi) for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy. The 2007 SPA agreement was an important milestone for Napo, allowing Napo to address and mitigate regulatory uncertainty prior to the completion of its final Phase 3 trial of crofelemer for its currently approved indication.

In October 2017, Napo established a scientific advisory board for each potential follow on indication currently planned for Mytesi. Napo has developed relationships with physicians and patient advocates around the world who are recognized specialists and key opinion leaders (KOLs) in the planned Mytesi follow on indications. The two charts below provide the names, credentials and affiliations of current Napo scientific advisory board members and KOL advisors to Napo.

We are confident that our scientific advisory boards will provide expert, actionable input regarding all aspects of development, including trial design, for Mytesi for our follow on indications—each of which addresses a significant, global, unmet medical need. We also expect that our scientific advisory board members will serve as speakers for our medical education programs, authors on Napo abstracts and publications, and as a resource for media inquiries.

Table of Contents

Napo's HIV Scientific Advisory Board has focused primarily on physician education, and community and global awareness regarding the importance and availability of solutions for neglected comorbidities, such as the first in class anti secretory mechanism of action of Mytesi for its currently approved indication.

Napo Scientific Advisory Board (SAB) Members

Pravin Chaturvedi, PhD	Chair of Napo's Scientific Advisory Boards; 25+ years drug development experience in pharmaceutical/biotech field; Successfully developed crofelemer (Mytesi) (first pivotal adaptive design)

HIV Physicians Scientific Advisory Board

David Asmuth, MD	Infectious diseases specialist and Professor of Medicine, UC Davis Health
Gary Blick, MD, AAHIVS	Founder of Health Care Advocates International and BEAT AIDS Project Zimbabwe
Christine Wanke, MD	Director of the Nutrition and Infection Unit; Associate Chair and Professor, Department of Public Health and Community Medicine; Professor, Department of Medicine, Tufts University School of Medicine; Professor, Sackler School of Biomedical Science; Professor, Friedman School of Nutrition Science and Policy

Cancer Therapy Related Diarrhea Scientific Advisory Board

Lee Schwartzberg, MD, FACP	Executive Director of the West Cancer Center, a multispecialty oncology practice affiliated with the University of Tennessee; Chief, Division of Hematology/Oncology, the University of Tennessee Health Science Center
Eric Roeland, M.D.	Attending Physician, Center for Palliative Care, Harvard Medical School
Hope Rugo, MD	Clinical Professor of Medicine, Director Breast Oncology and Clinical Trials Education, Division of Hematology and Oncology, University of California San Francisco

IBD Scientific Advisory Board

Corey Siegel, MD, MS	Associate Professor of Medicine; Associate Professor of The Dartmouth Institute; Director of the Inflammatory Bowel Disease Center at the Dartmouth Hitchcock Medical Center

Pediatric Indications (SBS and CDD) Scientific Advisory Board

Mohammed Miqdady, MD	Chief of Pediatric Gastroenterology, Hepatology & Nutrition at Sheikh Khalifa Medical City in Abu Dhabi

Table of Contents

Martin Martin, MD	Professor, Department of Pediatrics, David Geffen School of Medicine at UCLA
Sue Rhee, MD	Division Chief, Pediatric Gastroenterology, Hepatology and Nutrition Pediatric gastroenterologist and liver specialist, UCSF Benioff Children's Hospital

Key Opinion Leader (KOL) Advisors to Napo (on an as needed basis)

KOL Advisors: Cancer Therapy Related Diarrhea

Herbert DuPont, MD	Professor and Director, Center for Infectious Diseases, University of Texas Houston School of Public Health
Pablo C. Okhuysen, M.D.	Department of Infectious Diseases, Infection Control, and Employee Health, Division of Internal Medicine, MD Anderson

KOL Advisors: Diarrhea Related to IBD

David Rubin, MD	Joseph B. Kirsner Professor of Medicine Section Chief, Gastroenterology, Hepatology and Nutrition Co Director, Digestive Diseases Center, University of Chicago Medicine
Charles Bernstein, MD	Distinguished Professor of Medicine and Bingham Chair in Gastroenterology Research, University of Manitoba
William Sandborn, MD	Director, Inflammatory Bowel Disease Center Chief, Division of Gastroenterology Professor of Medicine, US San Diego Health
Scott Lee, MD	Associate Professor of Medicine, Digestive Health Center, University of Washington Medical Center
Edward Loftus, Jr., MD	Consultant, Division of Gastroenterology and Hepatology, Department of Internal Medicine, Mayo Clinic
Douglas Wolf, MD	Medical Director of IBD Research at Atlanta Gastroenterology Associates. Clinical Assistant Professor of Medicine, Emory University School of Medicine
Brooks D. Cash, MD, AGAF, FACG, FACP, FASGE	Division Director, Gastroenterology, Hepatology, and Nutrition Visiting Professor of Medicine, The University of Texas McGovern Medical School

KOL Advisors: Pediatric Indications (SBS and CDD)

Jay Thiagarajah, MD, PhD	Attending Physician, Division of Gastroenterology, Hepatology and Nutrition, Boston Children's Hospital. Instructor of Pediatrics, Harvard Medical School
James Goldenring, M.D., Ph.D.	Professor of Surgery, Vanderbilt University School of Medicine. Paul W. Sanger Chair in Experimental Surgery. Professor of Cell and Developmental Biology

Table of Contents

KOL Advisors: Diarrhea Related to HIV and other Infectious Diseases

Herbert DuPont, MD	Professor and Director, Center for Infectious Diseases, University of Texas Houston School of Public Health
Pradip Bardhan, MBBS, MD	Chief Physician at ICDDR,B, Bangladesh
Patrick Clay, Pharm D	Consultant
Paulo Pacheco, MD	Clinical Assistant Professor, Department of Medicine, New York University Langone Health
Elie Schochet, MD, FACS	Colorectal surgeon, Holy Cross Medical Group

KOL Advisors: Diarrhea Related to IBS

Anthony Lembo, MD	Director of the GI Motility and Functional Bowel Disorders Program at Beth Israel Deaconess Medical Center and Associate Professor of Medicine at Harvard Medical School
Doug Drossman, Co MD	Director Emeritus, UNC Center for Functional GI and Motility Disorders Adjunct Professor of Medicine and Psychiatry, University of North Carolina School of Medicine
William Chey, MD	Professor of Internal Medicine and Professor of Nutritional Sciences, University of Michigan School of Public Health

According to a 2017 report from Research and Markets, the combined global market for prescription and OTC gastrointestinal agents is expected to reach $21 billion by 2025. Jaguar estimates that a first in class anti secretory agent should be able to achieve a significant portion of the market share.

Our management team has significant experience in gastrointestinal product development for both humans and animals. Napo was founded 30 years ago to perform drug discovery and development by leveraging the knowledge of traditional healers working in rainforest areas. Ten members of the Jaguar and Napo team have been together for more than 15 years. Dr. Steven King, our executive vice president of sustainable supply, ethnobotanical research and intellectual property, and Lisa Conte, our founder, president and CEO, have worked together for more than 30 years. Together, these dedicated personnel successfully transformed crofelemer, which is extracted from trees growing in the rainforest, to Mytesi, which is a natural, sustainably harvested, FDA approved drug.

There are significant barriers to entry for Mytesi (crofelemer). Through Napo, we hold an extensive global patent portfolio. At the present time we hold approximately 142 issued worldwide patents, with coverage in many cases that extends until 2031. These issued patents cover multiple indications including HIV AIDS diarrhea, IBS, IBD, manufacturing, enteric protection from gastric juices, among others. We also have approximately 24 pending patent applications worldwide in the human health areas that are being prosecuted.

Mytesi is the first oral drug approved by the FDA under botanical guidance, which provides another barrier to entry from potential generic competition. The FDA requires that the manufacturer of crofelemer use a validated proprietary bioassay to release the drug substance and drug product of Mytesi. While most generic products are fashioned to meet chemical release specifications that are in the public domain, the specifics of this assay are not publicly available. There is no pathway by which a generic product can be developed for a drug approved under botanical guidance. In addition, Mytesi is not systemically absorbed, so the classic approach of creating a generic drug by

Table of Contents

matching pharmacokinetic blood levels is not possible. A generic player would have to conduct costly and risky clinical trials.

While Jaguar's commercial and development efforts have evolved to focus primarily on Mytesi and human pipeline indications since its merger with Napo, the Company is continuing limited initiatives related to Canalevia, its drug product candidate for treatment of chemotherapy induced diarrhea ("CID") in dogs, and Equilevia, its non prescription, personalized, premium product for total gut health in equine athletes. CID in dogs is typically caused by the same mechanism of action as in humans, and hence the work in dogs serves as a preclinical proof of concept for the diarrhea in humans that is related to targeted cancer therapy.

As previously announced, Jaguar has received MUMS (Minor Use and Minor Species) designation status from the FDA for Canalevia for the indication of CID in dogs. MUMS designation is modeled on the orphan drug designation for human drug development and offers possible financial incentives to encourage MUMS drug development, such as the availability of grants to help with the cost of developing the MUMS drug. Additionally, as announced on March 8, 2018, the FDA's Center for Veterinary Medicine (CVM) has indicated that Jaguar's Reasonable Expectation of Effectiveness (RxE) technical section is complete towards conditional approval of Canalevia. As announced March 20, 2019, Jaguar has completed the filing with CVM of the Chemistry, Manufacturing, and Controls (CMC) technical section in support of the Company's application for conditional approval of Canalevia for treatment of CID in dogs. Jaguar has now completed three of the four required technical sections—the CMC, Effectiveness, and Environmental Impact technical sections—of the Company's application for conditional approval of Canalevia for CID in dogs. We anticipate filing the Target Animal Safety technical section with CVM in the second quarter of 2019. If Canalevia is approved for CID in dogs, we expect to conduct the commercial launch of Canalevia for this indication in 2020.

Crofelemer is extracted from the Croton lechleri tree, which we sustainably harvest and manage through programs that we have been developing over the past 29 years. This process has involved working with communities to plant trees, obtaining permits for export, and creating a supply network that is robust and reliable.

We continue to have working relationships with partners that began in the 1990s. Additionally, through the establishment of a nonprofit called the Healing Forest Conservancy (HFC), our team has created a long term mechanism for benefit sharing that recognizes the intellectual contribution of indigenous populations. This program is intended to contribute to the continued strength and effectiveness of the valued and strategically important relationships we have carefully cultivated over the past 29 years.

Product Pipeline

In addition to our Mytesi (crofelemer) product that is approved by the U.S. FDA for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy, we are also developing a pipeline of prescription drug product candidates to address unmet needs in gastrointestinal health through Napo. Mytesi (crofelemer) is a novel, first in class anti secretory agent which has a basic normalizing effect locally on the gut, and this mechanism of action has the potential to benefit multiple disorders. Clinical trials demonstrated that nearly 80% of Mytesi users experienced an improvement in their diarrhea over a four week period. At week 20 of the pivotal trial, over half the patients had no watery stools, or a 100% decrease, and 83% had at least a 50% decrease in watery stools. Our Mytesi pipeline currently includes prescription drug product candidates for four follow on indications, several of which are backed by Phase 2 evidence from completed Phase 2 trials. In addition, a second generation proprietary anti secretory agent is in development for cholera.

Table of Contents

Napo Prescription Drug Product Candidates

Product Candidates	Indication	Completed Milestones	Current Phase of Development	Anticipated Near Term Milestones*
Mytesi	Cancer therapy related diarrhea (CTD)	•Two investigator initiated (IIT) clinical trials funded by Genentech Roche & Puma •Met with FDA in March 2019 to discuss the anticipated protocol for a planned pivotal trial	Phase 3	•Availability of interim data IIT for Genentech Roche-funded trial in Q2 2019
Mytesi	Supportive care for IBD	•Safety •Multiple Phase 2 studies completed in various secretory diarrhea (not IBD)	Phase 2	•Protocol development with KOLs for discussions with FDA
Formulation of crofelemer	Rare disease indications (SBS & CDD)	•Phase 1 study •Orphan drug designation for SBS	Phase 2	•Formulation/IIT, Abu Dhabi, Protocol design
Mytesi	Irritable bowel syndrome—diarrhea predominant (IBS D)	•Phase 1 study •Two Phase 2 studies completed	Phase 2	•Publication of supplemental analysis of Phase 2 data
Mytesi	Idiopathic/functional diarrhea	•Safety •Multiple Phase 2 studies completed in various secretory diarrhea •IIT request accepted	Phase 2	•Initiation of IIT
SB 300 (lechlemer)	Second generation anti secretory agent for multiple indications including cholera	•Animal and human studies in secretory diarrhea; successful cholera trial design for anti secretory mechanism of action with API	Pre IND	•Formulation / POC

*Clinical trials are funding dependent

Estimated Size of Mytesi Target Markets

We believe the medical need for Mytesi is significant, compelling, and unmet, and that doctors are looking for a drug product with a mechanism of action that is distinct from the options currently available to resolve diarrhea. A growing percentage of HIV patients have lived with the virus in their gut for 10+ years, often causing gut enteropathy

10

Table of Contents

and chronic or chronic episodic diarrhea. According to data from the U.S. Centers for Disease Control and Prevention, by 2020 more than 70% of Americans with HIV are expected to be 50 and older.(1)

Market	Number of Competitors for Mytesi's Approved/ Anticipated Labelled Indication	Market Size/Potential
HIV D	0	We estimate the U.S. market revenue potential for Mytesi to be approximately $100 million in gross annual sales
CTD	0	An estimated 650,000 U.S. cancer patients receive chemotherapy in an outpatient oncology clinic.(2) Comparable supportive care (i.e. CINV) product sales of ~$620 million in 2013, which is projected to reach $1.0 billion by 2020(3)
IBD	0	Estimated 1,171,000 Americans have IBD(4)
IBS D	3	Most IBS products have estimated revenue potential of greater than $1.0 billion(5)
CDD/SBS Cholera (hydration maintenance)	0	Financial benefits of Orphan drug Designation
PRV (SB 3000)	0	In recent transactions by other companies, priority review vouchers have sold for $67 million to $350 million(6)

(1) HIV Among People Aged 50 and Older (https://www.cdc.gov/hiv/group/age/olderamericans/index.html)

(2) Centers for Disease Control and Prevention. Preventing Infections in Cancer Patients: Information for Health Care Providers (cdc.gov/cancer/preventinfections/providers.htm)

(3) Heron Therapeutics, Inc. Form 10 K for the fiscal year ended December 31, 2016

(4) Kappelman, M. et al. Recent Trends in the Prevalence of Crohn's Disease and Ulcerative Colitis in a Commercially Insured US Population. Dig Dis Sci. 2013 Feb; 58(2): 519 525

(5) Merrill Lynch forecasts peak US sales of roughly $1.5 bn for Ironwood's Linzess (http://247wallst.com/healthcare business/2015/04/27/key-analyst-sees-nearly-30-upside-in-ironwood); Rodman & Rensha annual sales of Synergy Pharmaceuticals' Trulance at $2.3 bn in 2021 (Source: https://www.benzinga.com/analyst-ratings/analyst-color/17/03/9224181/analyst-synergy-pharma-could-achieve-su

(6) In Aug. 2015, AbbVie Inc. bought a priority review voucher from United Therapeutics Corp for $350 million (http://www.reuters.com/article/us-abbvie-priorityreview/abbvie-buys-special-review-voucher-for-350-million-idUSKCN0 In July 2014, BioMarin announced that it had sold a priority review voucher to Sanofi and Regeneron for $67.5 million. (https://investors.biomarin.com/2014-07-30-BioMarin-Sells-Priority-Review-Voucher-for-67-5-Million).

Table of Contents

The following diagram illustrates the mechanism of action of our human and animal gastrointestinal drug products and drug product candidates, which normalize chloride and water flow and transit time of fluids within the intestinal lumen.

Business Strategy

Our goal is to become a leading pharmaceutical company with first in class, sustainably derived products that address significant unmet gastrointestinal medical needs globally. To accomplish this goal, we plan to:

Expand Mytesi by leveraging our significant gastrointestinal knowledge, experience and intellectual property portfolio

Mytesi is a novel, first in class anti secretory agent which has a basic normalizing effect locally on the gut, and this mechanism of action has the potential to benefit multiple gastrointestinal disorders. Our Mytesi (crofelemer) product is approved by the U.S. FDA for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy. Jaguar, through Napo, holds extensive global rights for Mytesi. Mytesi is in development for multiple possible follow on indications, including diarrhea related to targeted cancer therapy; orphan drug indications for infants and children with congenital diarrheal disorders and short bowel syndrome; supportive care for inflammatory bowel disease; irritable bowel syndrome; and for idiopathic/functional diarrhea. In addition, a second generation proprietary anti secretory agent is in development for cholera.

Our management team collectively has more than 100 years of experience in the development of gastrointestinal prescription drug and non prescription products. This experience covers all aspects of product development, including discovery, preclinical and clinical development, GMP manufacturing, and regulatory strategy. Key members of this team successfully developed Mytesi.

Establish and expand commercial capabilities in Mytesi sales and marketing efforts

As announced on August 7, 2017, we appointed Pete Riojas, a 29 year pharmaceutical industry veteran, to lead Napo's direct sales organization, which is comprised of Mytesi field sales representatives strategically positioned to cover U.S. geographies with the highest potential. Additionally, in June 2018, we hired Robert J. Griffing, a seasoned industry veteran with a broad range of experience that includes commercializing supportive care and HIV treatments, as chief commercial officer for Napo. With support provided by concomitant marketing, promotional activities, patient empowerment programs, including an integrated social digital campaign, and medical education initiatives described below, we expect a proportional response in the number of patients treated with Mytesi.

In June 2018, as stated above, Napo entered into an agreement with RedHill Biopharma, a specialty biopharmaceutical company primarily focused on late clinical stage development and commercialization of proprietary drugs for gastrointestinal diseases and cancer, to establish a U.S. co promotion program for Mytesi. RedHill's specialized, GI focused field sales force promotes Mytesi to health care practitioners in 36 U.S. territories that contain

Table of Contents

significant numbers of HIV patients and health care practitioners that are not currently covered by Napo's field sales force. In these regions, RedHill sales representatives target gastroenterologists who see large populations of people living with HIV, along with nurse practitioners and physician assistants. RedHill field representatives also target lower level ART prescribing infectious disease specialists in regions currently covered by Napo's sales force. Four RedHill inside sales representatives actively target health care practitioners in other regions not covered by the Napo or RedHill field representatives. We believe this co promotion program will play a significant role in extending the reach of our commercial efforts into the GI medical community in support of the treatment of people living with HIV (PLWH) with Mytesi. Under the terms of the Agreement, RedHill is compensated based on performance, and the program can be extended by agreement between the two companies , as it was in January 2019.

Leverage our relationships with key opinion leaders regarding development of follow on indications

To date, more than 30 key opinion leaders (KOLs) who are recognized specialists in HIV patient care, CTD, IBD, IBS, cholera, SBS, CDD and equine gut health, are participating in our scientific advisory board or KOL advisory program in some manner.

Establish partnerships to support moving pipeline indications to pivotal clinical trials

Jaguar is actively pursuing development of a robust pipeline of potential follow on indications for crofelemer, and the Company's goal is to establish partnerships to support moving pipeline indications to pivotal clinical trials.

Strategically sequence the development of follow on indications of Mytesi and seek geographically focused licensing opportunities

As announced September 24, 2018, Jaguar and Knight Therapeutics Inc. ("Knight") entered into a Distribution, License and Supply Agreement that grants Knight the exclusive right to commercialize Mytesi and related products in Canada and Israel.

Although it is possible that we may enter into additional corporate partnering relationships related to Mytesi, our intention would be to retain all commercialization and promotional rights in the U.S., so that we do not become primarily a royalty collecting organization, and we are opposed to entering into any Mytesi partnering relationship that would require splitting indications. We are seeking to put limited geographically focused partnerships in place in the near term, while also considering possibilities for a worldwide partnership with a leading global entity (excluding the US exclusive commercial rights) in the field of gastrointestinal care and cancer in the long term.

Reduce risks relating to product development

Risk reduction is a key focus of our product development planning. Mytesi is approved for chronic indication, providing us the ability to leverage this corresponding safety data when seeking approval for planned follow on indications that are also chronic or chronic episodic indications. Crofelemer manufacturing is being conducted at two FDA-inspected and approved locations, including a new, multimillion dollar commercial manufacturing facility. In an effort to reduce risk further, we have implemented the following approach: First, we meet with key opinion leaders, typically at medical conferences—as we did in 2017 at Digestive Disease Week for IBS and IBD, the American Society of Clinical Oncology annual meeting, and the Multinational Association of Supportive Care and Congress. Next, we confirm unmet medical needs with these key opinion leaders and discuss the practicality of patient enrollment and trial implementation. We then generate protocols to discuss with the FDA, seeking, when possible, special protocol assessments. Our goal, by the time we start devoting significant funds to a clinical trial, is to have de risked the program as much as we believe we possibly can, in particular the regulatory pathway. We believe this approach will lead to better long term outcomes for our products in development.

We believe that Jaguar is poised to realize a number of synergistic, value adding benefits—and an expanded pipeline of important human follow on indications and a second generation anti secretory agent, upon which to build global partnerships.

Table of Contents

In May 2016, the New Drug Application ("NDA") and commercial rights for human applications of crofelemer (Mytesi) previously licensed to Salix Pharmaceuticals, Inc. ("Salix") were transferred to Napo. The active pharmaceutical ingredient ("API") in Mytesi is crofelemer, our proprietary, patented gastrointestinal anti secretory agent sustainably harvested from the rainforest.

Diarrhea is a common adverse event seen with chemotherapy agents typically used in breast and colon cancers, and in particular in the more recently introduced therapeutic classes of epidermal growth factor receptor ("EGFR") monoclonal antibodies and tyrosine kinase inhibitors ("TKI") often used for chronic adjuvant care management of cancer. The increased need for and use of these agents has made diarrhea one of the most disabling issues for cancer patients.

We will seek partnerships outside the United States for the above indications, while focusing on development, and commercial access in the United States directly. We are also focused on investigating SB 300 (lechlemer) for various gastrointestinal indications. Lechlemer is a proprietary Jaguar pharmaceutical product, a standardized botanical extract distinct from crofelemer, also sustainably derived from the Croton lechleri tree.

We believe lechlemer, which has the same mechanism of action as crofelemer and is significantly less costly to produce, may support efforts to receive a priority review voucher from the U.S. FDA for a cholera indication. Priority review vouchers are granted by the FDA to drug developers as an incentive to develop treatments for neglected diseases and rare pediatric diseases. Additionally, we believe lechlemer represents a long term pipeline opportunity as a second generation anti secretory agent, on a global basis, for multiple gastrointestinal diseases—especially in resource constrained countries where cost of goods is a factor, in part, because requirements often exist in such regions for drug prices to decrease annually.

The Company has presented Phase 2 data on crofelemer for the treatment of devastating dehydration in cholera patients from the renowned International Centre for Diarrhoeal Disease Research (icddr,b) in Bangladesh, and Napo plans to follow the same study design for a trial conducted in association with icddr,b in support of development of lechlemer for the potential cholera related indication.

Our portfolio development strategy is based on identifying indications that are potentially high value because they address important medical needs that are significantly or globally unmet, and then strategically sequencing indication development priorities, second generation product pipeline development, and partnering goals on a global basis.

Our technology for proprietary gastrointestinal disease products is central to the product pipelines of both veterinary and human indications. Crofelemer is also the API in Canalevia, our lead prescription drug product candidate, intended for the treatment of chemotherapy induced diarrhea in dogs. We expect our first veterinary prescription product launch will be Canalevia for chemotherapy induced diarrhea, an interesting commercial synergy with the pursuit of follow on indications for Mytesi.

Mytesi Clinical Data

Mytesi has been clinically demonstrated to have:

- Minimal absorption, with plasma concentrations below the level of detection
- No clinically relevant drug drug interactions
- No effect on viral load or CD4 counts
- Adverse events comparable to those with placebo

Table of Contents

The efficacy of Mytesi 125 mg delayed release tablets twice daily was evaluated in a randomized, double blind, 24 week, multicenter study (the ADVENT trial) comprised of a placebo controlled (1 month) treatment period and a placebo free (5 month) treatment period. The study enrolled HIV positive patients on stable ART with a history of diarrhea for 1 month or more. In the Mytesi 125mg bid group, more than twice as many patients (18% vs. 8% on placebo, $p<0.01$) achieved the highly rigorous endpoint defined as reduction to ≤2 watery stools per week for 2 out of the 4 weeks in the placebo controlled period (the average baseline in the ADVENT population was 20 watery stools per week).

In a supplemental analysis of the ADVENT study population, 78% of patients in the Mytesi 125mg BID group experienced a decrease in watery stools at week 4. Among these patients that experienced a decrease, 61% had at least a 50% decrease in watery stools. At week 20, 89% of patients in the Mytesi BID group experienced a decrease in watery stools. Among these patients that experienced a decrease, 83% had at least a 50% decrease in watery stools, and over half of patients had no watery stools at all (100% decrease).

Products in Development

Cancer Therapy Related Diarrhea (CTD)

Diarrhea related to TCT is a common problem with a relevant mechanism for crofelemer

National Cancer Institute Criteria for Grading Severity of Diarrhea

	Grade 1	Grade 2	Grade 3	Grade 4
Patients without a colostomy	Increase of <4 stools per day over pretreatment	Increase of 4 to 6 stools per day or nocturnal stools	Increase of ≥7 stools per day or incontinence; need for parenteral support for hydration	Physiologic consequences requiring intensive care; hemodynamic collapse

Diarrhea is a common adverse event seen with chemotherapy agents in the therapeutic classes of epidermal growth factor receptor (“EGFR”) tyrosine kinase inhibitors (“TKI’s”) and EGFR monoclonal antibodies (for breast, lung, and other malignancies). The increased need for and use of these agents has made diarrhea one of the most disabling issues for cancer patients. Crofelemer offers the potential for an appropriate mechanism of action against this likely secretory diarrhea and has prompted interest among physicians concerned about this diarrheal symptom, stimulating the aforementioned investigator initiated trials. Diarrhea is also a common adverse event seen with chemotherapy agents used in colorectal and gastric cancers, and chronic maintenance chemotherapy. There are currently no anti diarrhea agents approved generally for chemotherapy induced diarrhea.

Clinical Studies

A study titled HALT D: DiarrHeA Prevention and ProphyLaxis with Crofelemer in HER2 Positive Breast Cancer Patients Receiving Trastuzumab, Pertuzumab, and Docetaxel or Paclitaxel with or without Carboplatin is currently underway in conjunction with Georgetown University. The primary objective of the study is to characterize the incidence and severity of diarrhea in patients receiving investigational therapy in the setting of prophylactic anti diarrheal management.

A second study, titled An open label study to characterize the incidence and severity of diarrhea in patients with early stage HER2+ breast cancer treated with adjuvant trastuzumab and neratinib followed by neratinib monotherapy, and intensive anti diarrhea prophylaxis, is currently underway in conjunction with the University of California at San Francisco. The study is designed to evaluate crofelemer as a salvage anti diarrheal therapy used with the investigational breast cancer agent neratinib. The primary objective is to characterize the incidence and severity of diarrhea in patients with early stage breast cancer receiving adjuvant trastuzumab and neratinib followed by 1 year of

Table of Contents

neratinib monotherapy in the setting of prophylactic anti diarrheal management. The secondary objectives are to evaluate the activity of crofelemer as a rescue anti diarrheal medication; to assess neratinib adherence, holds, delays, and early discontinuation throughout the course of study therapy, which includes patients receiving neratinib for >1 year; and to assess overall toxicity including constipation and cardiac toxicity with concomitant neratinib and trastuzumab.

Irritable Bowel Syndrome—Diarrhea Predominant (IBS D)

Diarrhea is a common symptom of irritable bowel syndrome (IBS), a frustrating, underdiagnosed and undertreated condition. IBS D is a subtype characterized mainly by loose or watery stools at least 25 percent of the time. According to the U.S. FDA, studies estimate that IBS affects 10 to 15 percent of adults in the United States.

Abdominal pain is the key symptom of IBS, and the pain, which is associated with a change in stool frequency or consistency, can be severe. To improve the diagnosis and outcomes for IBS patients and to update clinicians on the latest research, Dr. William Chey, a gastroenterologist and professor of medicine and nutrition sciences at the University of Michigan, along with an international team of collaborators, compiled Rome IV, an updated compendium of diagnostic criteria on functional GI disorders such IBS. Rome IV contains a chapter titled Centrally Mediated Disorders of Gastrointestinal Pain.

Although new agents for IBS D have come on the market, there is an unmet medical need for long term, safe management of the abdominal pain associated with IBS D. We recognize that patients suffering from IBS D may require a poly pharmacy approach to lifetime management of their disease. Mytesi, which represents a novel mechanistic approach with the benefit of a long term safety profile, could possibly be an important addition to the treatment of IBS D, if approved for this indication.

Mytesi has been demonstrated to be safe for chronic use, and two studies provide statistically significant results of crofelemer use for abdominal pain in women.

The largest group of IBS sufferers are those with the subtype referred to as IBS M (mixed diarrhea and constipation). IBS M is also referred to as IBS A, because the condition often involves frequent alternating between IBS D and IBS C (constipation predominant). IBS M is distressing for patients as well as difficult to diagnose and manage, and is often associated with pain and urgency as well as significant abdominal distension and bloating. No approved drugs currently exist for IBS M. Leading gastroenterologists have stated that IBS C drugs may cause diarrhea in an IBS M patient, and an IBS D drug may cause significant constipation. Since Mytesi has not caused constipation in clinical trials or real-world experience, we therefore believe an opportunity exists for an IBS M indication for Mytesi. Resultingly, and due to the demonstrated safety of Mytesi for chronic use and its demonstrated benefit for abdominal pain in women, Napo is considering expanding development efforts to evaluate the IBS M indication.

Clinical Study

Crofelemer has been tested in safety studies and two significant Phase 2 studies for d-IBS (diarrhea-predominate Irritable Bowel Syndrome) as detailed below.

Table of Contents

Completed Studies—IBS D

Phase 2a—a randomized double blind placebo controlled, dose ranging (placebo, 125 mg, 250 mg, and 500 mg bid) study over a 12 week treatment period in 246 patients with d IBS (Rome II criteria), including both males and females, whose average age was 50 years old.

n=245 subjects

61 placebo

62 125 mg crofelemer BID

59 250 mg crofelemer BID

62 500 mg crofelemer BID

IBS symptoms (pain, urgency, stool frequency and consistency, and adequate relief) were self reported by the patients via an interactive voice response system. Patients needed to exhibit active disease during the two week baseline period as defined by a mean daily stool frequency greater than or equal to 2/day, pain score greater than or equal to 1 and stool consistency greater than or equal to 3 (5 point Lickert scale for pain and consistency) to be enrolled. Patients received treatment for 12 weeks followed by a two week treatment free period.

The protocol specified primary efficacy measure was daily stool consistency. Statistical analysis of the primary endpoint found no significant differences between placebo and any of the crofelemer dose groups ($p \geq 0.1434$) and no significant dose relationship was seen with regard to change from Baseline to Month 3 in stool consistency scores ($p = 0.1165$) in the ITT population.

A supplementary analysis of Rome Foundation defined stool consistency and abdominal pain showed positive results. Responders were subjects who had stool consistency score of ≥ 4 for < 25% of days in a given week and ≥ 30% improvement in abdominal pain scores a given week (i.e., Rome Foundation defined stool consistency and abdominal pain responders).

When we look at a supplemental analysis at a reduction in a composite abdominal pain/stool consistency endpoint, the regulatory endpoint in accordance with FDA guidance, we see at the 125 mg dose bid a significant 15% difference with just women patients compared to placebo; and a significant 11% when we include both men and women. The current IBS-d products on the market have a 7 8% reduction (Viberzi and Xifaxan).

In this analysis, Rome Foundation defined stool consistency and abdominal pain responders were significantly more likely during the entire 3 months in the 125 mg BID group when compared with placebo (24.2% versus 13.1%, $p = 0.0399$) and there was a statistical trend in favor of crofelemer 125 mg BID during Months 1 through 2 (27.4% versus 16.4%, $p = 0.0640$). Similar positive effects of crofelemer 125 mg BID were observed in female subjects ($n = 183$). When the supplementary analysis was applied to the female patients, crofelemer at a dose of 125 mg BID was superior to placebo at Month 3 (26.1% vs 10.9%, $p=0.0337$).

- Results: The 125mg bid of crofelemer exhibited a consistent response during each month among most efficacy endpoints in women with d IBS reaching statistical significance ($p<0.05$) for pain.
- Crofelemer had little effect on the stool consistency score, though there was a trend toward reduced stool frequency.
- Treatment benefits were not apparent in men, although relatively few men enrolled in the trial (13 16/group).

As with previous trials of crofelemer, no drug related serious adverse events were reported. Adverse event rates were similar across all dose groups, although in the two highest doses (250 and 500 mg bid) there were a higher percentage of dropouts. There were no drug related or dose related differences in constipation. During the two week treatment free follow up period symptoms approached baseline levels.

Table of Contents

Safety: Crofelemer at doses of 125, 250 and 500 mg had a safety profile that was generally similar to placebo among men and women with IBS-D.

Phase 2—A Randomized, double blind, placebo controlled study to assess the safety and efficacy of crofelemer for the symptomatic treatment of diarrhea predominant irritable bowel syndrome (d IBS) in 240 female subjects 18 years or older with active d IBS according to the Rome II criteria for the diagnosis of d IBS.

The study consisted of a 2 week screening period and a 12 week blinded treatment period followed by a 4 week treatment free follow up period. During the 12 week treatment period 240 subjects were given 125 mg of crofelemer BID or placebo BID and recorded daily assessments of their IBS symptoms in the interactive voice response system.

The primary endpoint was the change from baseline for overall percentage of abdominal pain/discomfort free days (PFDs). On a daily basis, respondents recorded the intensity of their abdominal pain/discomfort for that day using the 5 pint Likert scale: 0=none, 1=mild, 2=moderate, 3=intense, 4=severe. Any day that a score of zero (0) was recorded was considered a PFD.

Stool consistency and abdominal pain endpoints were analyzed using definitions of symptom improvement from a recent FDA guidance on IBS endpoints (March 2010) and recommendations of the Rome Foundation (letter dated 28 June 2010) concerning the IBS endpoints described in this guidance.

Results: The overall increase in pain free days (protocol specified primary endpoint) for subjects in the crofelemer group was not statistically significant when compared with subjects in the placebo group ($p = 0.5107$)

A supplementary analysis of abdominal pain showed positive results. Responders were subjects who had ≥ 30% improvement in abdominal pain scores a given week (i.e., FDA defined abdominal pain responders; this definition of abdominal pain responders was presented in the March 2010 guidance on IBS endpoints).

In this analysis, abdominal pain responders were significantly more likely during Months 1 through 2 (58.3% versus 45.0%, $p = 0.0303$) and during the entire 3 months (54.2% versus 42.5%, $p = 0.0371$) in the crofelemer group when compared to placebo.

Safety: The overall safety profile for crofelemer 125 mg BID for 12 weeks was comparable to that observed with placebo and was consistent with the IBS population under study.

Rare Pediatric Disease Indications: Congenital Diarrheal Disorders and Short Bowel Syndrome (SBS)

Congenital diarrheal disorders (CDD) are a group of rare, chronic intestinal channel diseases, occurring in early infancy, that are characterized by severe, lifelong diarrhea and a lifelong need for nutritional intake either parenterally or with a feeding tube. CDDs are related to specific genetic defects inherited as autosomal recessive traits, and the incidence of CDDs is much more prevalent in regions where consanguineous marriage is part of the culture. CDDs are directly associated with serious secondary conditions including dehydration, metabolic acidosis, and failure to thrive, prompting the need for immediate therapy to prevent death and limit lifelong disability.

Potential Orphan Drug: Congenital Diarrheal Disorders (CDD) & Short Bowel Syndrome (SBS)

Clinical Study—CDD

We have completed safety studies of crofelemer in children as young as 3 months of age, and Napo has accepted a request for support submitted by Dr. Mohamad Miqdady, Chief of Pediatric Gastroenterology, Hepatology and

Nutrition at Sheikh Khalifa Medical City (SKMC) in Abu Dhabi, for an investigator initiated trial of crofelemer, the active pharmaceutical ingredient in Mytesi, for CDD in children.

Table of Contents

A pre clinical study in mice, conducted by an independent third party investigator, is underway to support possible orphan drug designation for crofelemer for Congenital Diarrheal Disorders (CDD). This animal model study is examining the effects of crofelemer on diarrhea caused by microvillous inclusion disease (MVID), a very rare autosomal recessive disorder which belongs to the CDD category.

SBS is a complex condition characterized by malabsorption of fluids and nutrients due to congenital deficiencies or surgical resection of small bowel segments. Consequently, patients suffer from symptoms such as debilitating diarrhea, malnutrition, dehydration and imbalances of fluids and salts. This could be due to either a genetic disorder or premature birth. In countries such as the United Arab Emirates and Saudi Arabia, SBS occurs with much higher incidence. Napo recently visited with medical centers in this region.

We have received orphan drug status for Mytesi (crofelemer) for the SBS pediatric indication and are pursuing orphan drug status for CDD. The mission of the FDA Office of Orphan Products Development is to advance the evaluation and development of products (drugs, biologics, devices, or medical foods) that demonstrate promise for the diagnosis and/or treatment of rare diseases or conditions.

IBD—Supportive Care:

Key opinion leaders (“KOLs”) identified an unmet need to treat diarrhea in IBD patients, particularly in specific subsets of patients. KOLs felt all IBD patients who undergo ileal pouch anal anastomosis (IPAA) surgery suffer severe, chronic diarrhea following the procedure. Because this is a highly motivated patient population with a low placebo responder risk, we believe a relatively small proof of concept trial is the appropriate next step from a development standpoint.

KOLs felt crofelemer’s novel mechanism of action may also prove to be an effective treatment for diarrhea that results from bile acid malabsorption, which has been shown to occur in approximately 30% of patients with IBD.

Additionally, KOLs felt crofelemer’s novel mechanism of action may prove to be an effective treatment for diarrhea experienced by patients receiving IV infusions of Entyvio, a Takeda Pharmaceuticals prescription medicine used in adults with moderate to severe ulcerative colitis or Crohn’s disease. Secretory diarrhea occurs when the intestine does not complete absorption of electrolytes and water from luminal contents. This can happen when a nonabsorbable, osmotically active substance is ingested (“osmotic diarrhea”) or when electrolyte absorption is impaired (“secretory diarrhea”).

Secretory diarrhea can result from bacterial toxins, luminal secretagogues (such as bile acids or laxatives), reduced absorptive surface area caused by disease or resection, circulating secretagogues (such as various hormones, drugs, and poisons), and medical problems that compromise regulation of intestinal function. These studies in acute diarrhea support the normalizing aspect of the mechanism of action, regardless of the cause of the diarrhea, and are supportive of the supportive care indication under development in IBD patients.

Clinical Study

Mytesi has safety studies that support chronic use for the current approved indication, and has demonstrated statistically significant results in multiple supportive care settings, though not specifically in IBD patients. Next steps would include a Phase 2 proof of concept study for supportive care in patients with IBD.

Completed Study—Travelers’ Diarrhea (supportive care)

Phase 2—A study of crofelemer in 184 persons in a double blind, placebo controlled study for the symptomatic treatment of acute diarrhea among travelers to Jamaica and Mexico.

The study was designed to evaluate the effectiveness of crofelemer in the treatment of travelers' diarrhea.

Table of Contents

A total of 184 persons from the United States who acquired diarrhea in Jamaica or Mexico were enrolled in a double blind, placebo controlled study examining the effectiveness of three doses of crofelemer in reducing illness. Subjects were treated with 125 mg, 250 mg, or 500 mg crofelemer or a matching placebo four times a day for 2 days. Subjects kept daily diaries of symptoms and were seen each day for 3 days. Of the subjects, 169 (92%) were included in the efficacy analysis.

The most common etiological agent identified was enterotoxigenic Escherichia coli, found in 19% of subjects. The mean time interval from taking the first dose of medication until passage of the last unformed stool during 48 hour therapy (TLUS48) was 38.7 hours for the placebo group.

TLUS48 was shortened by crofelemer:

30.6 h for the 125 mg dose group ($p = 0.005$);

30.3 h for the 250 mg group; and

32.6 h for the 500 mg group ($p = 0.01$).

Treatment failures were seen in 29.3% in the placebo group compared with 7.3% ($p = 0.01$), 4.3 ($p = 0.002$), and 9.8 ($p = 0.026$) in the three treatment groups. Crofelemer was well tolerated at all doses.

The study provided statistically significant results of crofelemer use for shortening the duration of travelers' diarrhea. This antisecretory approach works directly against the pathophysiology of travelers' diarrhea and is not likely to potentiate invasive forms of diarrhea or to produce posttreatment constipation.

Cholera/General Watery Diarrhea

According to the Centers for Disease Control and Prevention of the U.S. Department of Health & Human Services, Cholera is an acute, diarrheal illness caused by infection of the intestine with the bacterium Vibrio cholerae. An estimated 3 5 million cases and over 100,000 deaths occur each year around the world. The infection is often mild or without symptoms, but can sometimes be severe. Approximately one in 10 (5 10%) of infected persons will have severe disease characterized by profuse watery diarrhea, vomiting, and leg cramps. In these people, rapid loss of body fluids leads to dehydration and shock. Without treatment, death can occur within hours. At this time, for example, the largest cholera outbreak in recorded history is occurring in Yemen.

We are investigating lechlemer for the indication of cholera/general watery diarrhea. Lechlemer is a distinct and proprietary Napo pharmaceutical formulation of a standardized botanical extract, also sustainably derived from the Croton lechleri tree. We believe lechlemer represents a long term pipeline opportunity as a second generation anti secretory agent, on a global basis, for multiple gastrointestinal diseases. Additionally, we believe lechlemer, which has the same mechanism of action as crofelemer and is significantly less costly to produce, may support efforts to receive a priority review voucher from the U.S. FDA for a cholera indication. Priority review vouchers are granted by the FDA to drug developers as an incentive to develop treatments for neglected diseases and rare pediatric diseases. If approved for this indication, lechlemer could serve as long term pipeline anti secretory agent for cholera/general watery diarrhea in geographies where cost of goods is a critical factor, for example, in resource constrained regions and countries in which a requirement exists for drug prices to decrease annually.

Clinical Study

We have initiated CMC and have multiple animal and human studies in secretory diarrheas. We have also completed a successful trial design for cholera with an anti secretory mechanism of action, published studies with crofelemer in patients with cholera and other acute severe watery diarrhea disease.

Table of Contents

Completed Studies—Cholera and Severe Acute Dehydrating Watery Diarrhea

Phase 2 study of crofelemer in the treatment acute, severely dehydrating watery diarrhea with confirmed cholera with the use of an antibiotic (azithromycin) and oral rehydration therapy in 100 adult patients between 18 and 55 in Bangladesh.

A total of 100 adult patients, from Bangladesh, between the ages of 18 and 55, with acute, severely dehydrating watery diarrhea with confirmed cholera were treated with crofelemer on a background of an antibiotic (azithromycin) and oral rehydration therapy. After a four hour period of rapid rehydration therapy, patients were randomized 1:2:2 to placebo or 125 mg or 250 mg oral dose of crofelemer. Crofelemer or placebo doses were administered about one hour after the oral administration of azithromycin (1 gm dose). The primary objective was to evaluate the safety and effects of crofelemer on reducing the watery stool output normalized to body weight (mL/kg) in the first 24 hours on the background of azithromycin and rehydration therapy. Crofelemer was well tolerated and there were no drug related adverse events in this study. Both doses of crofelemer produced approximately 25 30% reduction in median watery stool volumes in the 0 6 and 0 12 hour period following initiation of therapy. Crofelemer showed a strong trend in the reduction of watery stool output in the 0 6 hour and 0 12 hour intervals (p=0.07). Upon exclusion of three outlier patients, the crofelemer dose of 125 mg produced a statistically significant reduction in the normalized stool output (p=0.028) and the dose of 250 mg crofelemer showed a strong trend for reduction of watery stool output (p=0.07).

In another study, the effects of crofelemer were evaluated in patients with acute dehydrating watery diarrhea caused by various bacterial pathogens, such as enterotoxic strains of Escherichia coli (ETEC) and Vibrio cholerae infection. Crofelemer was evaluated in adult Indian patients with acute watery diarrhea of less than 24 hour duration with suspected bacterial infections, without the use of antibiotics. In this study, patients received oral doses of placebo or crofelemer at a dose of 250 mg every 6 hours for 2 days on the background of oral rehydration therapy only. The use of antibiotics was prohibited in this study. A total of 98 patients were randomized into this study (47 in placebo group and 51 in the crofelemer group). Primary endpoints for this study were changes in stool weight, frequency, consistency, duration of diarrhea. Secondary endpoints included the assessment of clinical symptoms scored as total of 7 item GI index. Clinical success was defined as no diarrhea within 48 hours from study start date and treatment failure was defined as no improvement/worsening of symptoms after 24 hours, fever, bloody stools or dehydration.

Results: 98 patients (51 crofelemer, 47 placebo) were enrolled in the study. 16 patients (4 in the crofelemer group and 12 in the placebo group) used antibiotics and were considered as treatment failures and were excluded from the “per protocol efficacy analysis”. Groups were similar in age, weight, vital signs, stool frequency, consistency, dehydration and GI index.

The crofelemer group had improvement over baseline and compared to placebo at day 3. More specifically, crofelemer showed superior effects in reducing stool weight (61% vs 11%), stool frequency (65% vs 21%), reversion to soft stool (92% vs 49%) and improved the 7 item GI index (70% C vs 33% P), (all p<0.05).

Crofelemer was well tolerated with no related serious adverse events or concerning changes in lab values. Progression to dehydration and report of fecal incontinence was more common in placebo group (p<0.05).

Conclusions: Clinical success (cessation of diarrhea within 48 hours of 1st dose) was achieved in 79% of crofelemer patients compared to 28% placebo patients (p<0.05).

Other Product Potential Future Indications

Institutional Diarrhea

Patients in medical institutions such as hospitals often experience diarrhea following infection with Clostridium difficile, an anaerobic bacillus shed in feces. According to the Centers for Disease Control and Prevention of the U.S. Department of Health & Human Services, any surface, device, or material (e.g., commodes, bathing tubs, and electronic rectal thermometers) that becomes contaminated with feces may serve as a reservoir for the C. difficile spores, which

Table of Contents

are transferred to patients mainly via the hands of healthcare personnel who have touched a contaminated surface or item. We believe development of an approved formulation of crofelemer for use in C. difficile has the potential to help patients infected with C. difficile leave the hospital sooner, help keep patients infected with C. difficile out of the hospital, and aid in controlling C. difficile contagion in institutional settings, which would also represent a significant economic benefit.

Competition

There are several significantly larger pharmaceutical companies competing with us in the gastrointestinal segment. These companies include Valeant Pharmaceuticals International, Merck & Co., Inc., and Allergan plc as well as smaller pharmaceutical companies.

Diarrhea in adult patients living with HIV/AIDs. We are not aware of any other FDA approved drugs for the symptomatic relief of diarrhea in HIV/AIDs patients. HIV/AIDs patients also use loperamide and over the counter anti diarrheal remedies such as Mylanta or Kaopectate to treat their diarrhea, but these medicines affect motility and can result in rebound diarrhea.

Diarrhea predominant irritable bowel syndrome. Two drugs were approved in 2015 for the treatment of diarrhea predominant irritable bowel syndrome, Allergan plc's Virbezi and Xifaxan which is marketed by Valeant Pharmaceuticals International. Also, Lotronex was approved by the FDA in 2000 but was withdrawn from the market and later reintroduced in 2002 under a Risk Management Program. With the exception of Lotronex, the sponsors of Verbezi and Xifaxan employ extensive media and print promotion for the commercialization of these products. We are seeking a partner to further the clinical development and commercialization of crofelemer for d IBS. There are currently numerous trials on going for d IBS.

Pediatric diarrhea. Acute diarrhea in children is commonly treated by a change in diet, oral rehydration therapy and/or antibiotics, assuming the cause of the diarrhea is bacterial in nature. Children aged 12 and younger are advised not to use anti motility drugs (loperamide for example) unless directed to do so by a physician. There are recent clinical trials for probiotics and zinc sulfate. Other recent anti diarrheal studies in children include a safety and tolerability study of Fidaxomicin for C difficile associated diarrhea.

Cancer therapy-related diarrhea. We are not aware of any FDA approved drugs specifically indicated for cancer therapy-related diarrhea, including chemotherapy-related diarrhea. A recent Phase IIb trial of elsiglutide for the treatment of chemotherapy induced diarrhea in colorectal cancer patients did not meet statistical significance. Opioids and over the counter drugs are commonly used to treat chemotherapy induced diarrhea, but these drugs affect motility. Certain tyrosine kinase inhibitor chemotherapy agents have diarrhea as a significant side effect. For example, FDA guidance suggests diarrhea prophylaxis prior to initiating adjuvant therapy with neratinib.

Congenital Diarrheal Disorders and Short Bowel Syndrome. We are not aware of any FDA approved drugs specifically indicated for Congenital Diarrheal Disorders and Short Bowel Syndrome.

Cholera. We are not aware of any FDA approved drugs specifically indicated as an anti secretory agent for use to address the devastating dehydration in cholera patients.

Irritable Bowel Syndrome (IBS). If we receive regulatory approval for Mytesi for IBS, we expect to compete with major pharmaceutical and biotechnology companies that operate in the gastrointestinal space, such as Sucampo AG, Takeda Pharmaceuticals, Allergan, Inc., Ironwood Pharmaceuticals, Inc., Synergy Pharmaceuticals Inc., Sebela Pharmaceuticals, Inc. and Salix Pharmaceuticals. Because Mytesi is approved with chronic safety and several of the other agents have safety concerns, there is likely to be an opportunity for a polypharmacetuical approach to long term

management of these patients, removing a direct competitive scenario from Mytesi's potential entry to the marketplace and disease indication.

Table of Contents

To our knowledge, there are currently no FDA approved anti secretory products, in particular which act locally in the gut with the chronic safety profile of crofelemer, in development or on the market. Crofelemer represents a new tool in gastrointestinal disease management.

Distribution and Marketing Agreements

Napo has agreements in place with BexR, a distributor in Texas, for the distribution, marketing and sale of Mytesi. The agreement compensates BexR with a percentage of net sales, as defined. Payments by Napo to BexR will be a specified percentage of net sales, ranging in the low double digits but in no instance exceeding 20% of net sales, depending on the period in which the sales occur and the amount of such sales.

On December 4, 2018, Napo entered into the Suspension, Settlement and Termination Agreement (the "Termination Agreement") with SmartPharma, LLC ("SmartPharma") and the Company, as guarantor, pursuant to which the parties mutually agreed to suspend and then terminate the Strategic Marketing Alliance Agreement, dated April 4, 2016, between Napo and SmartPharma (the "Alliance Agreement"). Under the Alliance Agreement, SmartPharma performed certain marketing and commercialization activities (collectively, the "SP Services") with respect to Mytesi in consideration for the receipt of a specified percentage of net sales ranging in the low double digits but in no instance exceeding 20% of net sales, depending on the amount of such sales. In the event of termination, Napo would be required to pay SmartPharma a termination fee equal to a certain percentage of net sales generated within a specified period after the termination date. All payment obligations under the Termination Agreement are guaranteed by Jaguar. The Buyout Fee was made on or before January 8, 2019 and the Alliance Agreement has been automatically terminated.

Manufacturing

The plant material used to manufacture is crude plant latex ("CPL") extracted and purified from Croton lechleri, a widespread and naturally regenerating tree in the rainforest that is managed as part of sustainable harvesting programs. The tree is found in several South American countries and has been the focus of long term sustainable harvesting research and development work. Napo's collaborating suppliers obtain CPL and arrange for the shipment of CPL to Napo's third party contract manufacturer.

Napo's third party contract manufacturer, India based Glenmark Pharmaceuticals Ltd. (Glenmark), a research driven, global, integrated pharmaceutical company, is Napo's primary manufacturer of crofelemer, the active pharmaceutical ingredient in Mytesi. Glenmark processes CPL into crofelemer utilizing a proprietary manufacturing process. The processing occurs at two FDA approved Glenmark facilities. Additionally, Napo plans to establish a third processing site, which will be operated by Indena S.p.A., a Milan, Italy based contract manufacturer dedicated to the identification, development and production of high quality active principles derived from plants, for use in the pharmaceutical, health food and personal care industries. Indena has completed the required technology transfer and pilot manufacturing and has the equipment in place for the initiation of scale up and validation activities to ultimately support commercial scale manufacturing.

Canalevia will be manufactured by the same process used to manufacture the API that was used in the animal safety studies and the human studies in support of the approval of Mytesi. Napo has also licensed this intellectual property to third parties in connection with its agreements related to the manufacture of crofelemer.

In May 2014 and June 2014, and as amended in February 2015, we entered into binding memorandums of understanding with Indena S.p.A. to negotiate a definitive commercial supply agreement for the manufacture of crofelemer and the botanical extract, SB 300.

We have contracts in place with all the manufacturers and third party testing labs required to manufacture Mytesi and lechlemer. We are finalizing a master service agreement with Glenmark for the manufacture of crofelemer which addresses cost of goods reductions at increasing scale. We are in the process of evaluating alternative and

Table of Contents

secondary third parties to reduce costs associated with finished product manufacture and the assays necessary to the release specifications of Mytesi.

Proprietary Library of Medicinal Plants

We possess a proprietary library of more than 2,300 medicinal plants.

Intellectual Property

Trademarks

We plan to market all of our products under a trademark or trademarks we select and we will own all rights, title and interest, including all goodwill, associated with such trademarks. Mytesi is a registered trademark owned by Napo.

License Agreements

Termination, Asset Transfer and Transition Agreement

On September 19, 2017 (the "Transfer Date"), Napo entered into the Termination, Asset Transfer and Transition Agreement (the "Glenmark Transition Agreement") with Glenmark. The Glenmark Transition Agreement supersedes the Glenmark Collaboration Agreement and returns to Napo certain rights which Napo licensed to Glenmark pursuant to the Glenmark Collaboration Agreement related to the development and commercialization of crofelemer for certain specified human indications in India and 140 other countries largely in developing regions (the "Transferred Assets").

As a result of the execution of the Glenmark Transition Agreement, we, through Napo, now hold extensive global rights for Mytesi, and also hold commercial rights to the existing regulatory approvals for crofelemer in Brazil, Ecuador, Zimbabwe and Botswana.

In consideration for Glenmark's assignment and transfer of the Transferred Assets to Napo, Napo agreed to pay Glenmark in cash, within 45 days after receipt by Napo, 25% of any payment that Napo receives from a third party to whom Napo grants a license or sublicense or with whom Napo partners in respect of, or sells or otherwise transfers the certain specified human indications in India and 140 other countries largely in developing regions any of the Transferred Assets, subject to certain limitations, until Glenmark has received a total of $7 million. As additional consideration for the assignment and transfer of the Transferred Assets, Napo agreed (i) to enter into a manufacturing and supply agreement with Glenmark for crofelemer, which will be manufactured at either or both of Glenmark's facilities in India (this master service agreement is in final draft form, though not yet fully executed) and (ii) to transfer and assign to Glenmark all right, title and interest in and to certain required dedicated equipment used to manufacture crofelemer located at Glenmark's Ankleshwar facility, subject to certain limitations.

Table of Contents

Patent Portfolio

Napo

Napo owns a portfolio of patents and patent applications covering formulations of and methods of treatment with proanthocyanidin polymers isolated from Croton spp. or Calophyllum spp., including Mytesi (crofelemer). The patent family associated with International Patent publication WO1998/16111 relates to enteric protected formulations of proanthocyanidin polymers isolated from Croton spp. or Calophyllum spp., including crofelemer, and methods of treating watery diarrhea using these enteric protected formulations. There is one U.S. patent in force in this family, US 7,341,744, which has a term until at least June 23, 2019, which term has been extended under 35 U.S.C. 156 by 1,075 days. Based upon the June 23, 2019 expiration date, the expiration date for crofelemer is June 2, 2022, to account for the regulatory delay in obtaining human marketing approval for crofelemer.

Napo additionally owns a family of patents arising from International Patent Application Publication WO2012/058664 that cover methods of treating HIV associated diarrhea and HAART associated diarrhea with proanthocyanidin polymers isolated from Croton spp. or Calophyllum spp., including crofelemer. In the U.S., there are two issued patents, US 8,962,680 and US 9,585,868, both of which expire October 31, 2031. Outside the U.S., patent protection for methods of treating HIV associated diarrhea has been obtained in Australia, Europe, Hong Kong, Japan, Kenya, Mexico, Russia, Ukraine, South Africa, and Zimbabwe, with expiration dates of October 31, 2031, and applications are pending in Brazil, Hong Kong, Canada, China, and Malaysia. Napo also has patent families related to methods of treating diarrhea predominant irritable bowel syndrome, methods of treating constipation predominant irritable bowel syndrome, and methods of treating inflammatory bowel disease, familial adenomatous polyposis and colon cancer, with proanthocyanidin polymers isolated from Croton spp. or Calophyllum spp., including crofelemer. In particular, for diarrhea predominant irritable bowel syndrome, Napo has two issued U.S. patents, US 8,846,113 and US 9,980,938, which expire on February 9, 2027, as well as issued patents in Australia, Canada, Europe, Gulf States, Hong Kong, Japan, South Korea, Mexico, New Zealand, Singapore, and Taiwan and pending applications in Bangladesh, Bolivia, Chile, Mexico, Panama, Peru, Paraguay, Thailand, and Venezuela, all of which are estimated to expire April 30, 2027; for constipation predominant irritable bowel syndrome, Napo has three issued U.S. patents, with terms to at least April 30, 2027, patents in Australia, Canada, Europe, Hong Kong, Mexico, New Zealand, and Singapore, all of which are estimated to expire April 30, 2027; and for inflammatory bowel disease, familial adenomatous polyposis and/or colon cancer, Napo has two issued U.S. patents, US 8,852,649 and US 9,987,250 with terms until at least January 4, 2028, as well as issued patents in Australia, Hong Kong, and Europe and an allowed application in Canada, which have estimated expiration dates of April 30, 2027. Napo has a pending U.S. non provisional application for the treatment of chemotherapy induced diarrhea (CID) with crofelemer filed on March 9, 2018 and two International Patent Applications on other human indications including for the treatments of short bowel syndrome and congenital diarrhea disorder filed on May 31, 2018.

For methods of manufacturing proanthocyanidin polymers isolated from Croton spp. or Calophyllum spp., including crofelemer, Napo owns issued patents in India, South Africa, and Eurasia with terms at least until August 26, 2029. Napo also owns issued patents in India, Russia, and South Africa and pending applications in Argentina, Brazil, and Venezuela that also cover methods of manufacturing proanthocyanidin polymers isolated from Croton spp. or Calophyllum spp., including crofelemer, with terms at least until January 17, 2032. Napo holds a patent in South Africa covering non enteric formulations of crofelemer estimated to expire August 17, 2032. Lastly, Napo owns two U.S. patents covering a formulation of NP 500 (nordihydroguiaretic acid (NDGA)) and its use in treating a metabolic disorder that have terms until April 23, 2031.

Government Regulation

The FDA and comparable regulatory authorities in state and local jurisdictions and in other countries impose substantial and burdensome requirements upon companies involved in the clinical development, manufacture, marketing and distribution of prescription drugs such as those Napo is developing. These agencies and other federal, state and local entities regulate, among other things, the research and development, testing, manufacture, quality control, safety, effectiveness, labeling, storage, record keeping, approval, advertising and promotion, distribution, post approval monitoring and reporting, sampling and export and import of Napo's drug product candidates. To comply with the

Table of Contents

regulatory requirements in each of the jurisdictions in which Napo is seeking to market and subsequently sell its prescription products, Napo is establishing processes and resources to provide oversight of the development, approval processes and launch of its products and to position those products in order to gain market share.

U.S. Government Regulation

In the United States, the FDA approves and regulates drugs under the Federal Food, Drug, and Cosmetic Act ("FDCA"), and its implementing regulations.

The process of obtaining regulatory approvals and the subsequent compliance with applicable federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant to a variety of administrative or judicial sanctions, such as the FDA's refusal to approve pending NDAs, withdrawal of an approval, imposition of a clinical hold, issuance of warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement or civil or criminal penalties.

The process required by the FDA before a drug may be marketed in the United States generally involves the following:

- completion of pre clinical laboratory tests, animal studies and formulation studies in compliance with the FDA's good laboratory practice, or GLP, regulations;
- submission to the FDA of an investigational new drug application, or IND, which must become approved before human clinical trials may begin;
- approval by an institutional review board, or IRB, of the study protocol and informed consent forms for the clinical site before each trial may be initiated. Multiple sites may necessitate the involvement of multiple IRBs and submissions;
- performance of adequate and well controlled human clinical trials in accordance with good clinical practice, or GCP, requirements to establish the safety and efficacy of the proposed drug product for each indication;
- submission to the FDA of an NDA which would include the study reports of the clinical trials, chemistry and manufacturing of the active pharmaceutical ingredient and the final dosage form as well as other required sections to be included in the NDA;
- satisfactory completion of an FDA advisory committee review, if applicable;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with current good manufacturing practice, or cGMP, requirements and to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity; and
- FDA review and approval of the NDA.

Pre clinical Studies

Pre clinical studies include laboratory evaluation of the drug product's chemistry, toxicity and formulation, as well as animal studies to assess potential safety and efficacy. An IND sponsor must submit the results of the pre clinical tests, together with manufacturing information, analytical data and any available clinical data or literature, among other things, to the FDA as part of an IND. Some pre clinical testing may continue even after the IND is submitted. An IND

Table of Contents

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 clinical trial on a 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

Clinical trials involve the administration of the investigational new drug to human subjects pursuant to a clinical protocol, under the supervision of qualified investigators in accordance with GCP requirements, which include the requirement that all research subjects provide their informed consent in writing for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives or endpoints of the trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated. A protocol for each clinical trial and any subsequent protocol amendments must be submitted to the FDA under the IND. In addition, an IRB at each institution participating in the clinical trial must review and approve the plan for any clinical trial before it commences at that institution. Information about certain clinical trials must be submitted within specific timeframes to the National Institutes of Health, or NIH, for public dissemination on their www.clinicaltrials.govwebsite.

Human clinical trials are typically conducted in three sequential phases, which may overlap or be combined:

- Phase 1: The drug is initially introduced into healthy human subjects or patients with the target disease or condition and tested for safety, dosage tolerance, absorption, metabolism, distribution, excretion and, if possible, to gain an early indication of its effectiveness depending on the endpoints set forth in the protocol.
- Phase 2: The drug is administered to a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage.
- Phase 3: The drug is administered to an expanded patient population, generally at geographically dispersed clinical trial sites, in well controlled clinical trials to generate enough data to statistically evaluate the efficacy and safety of the product for approval, to establish the overall risk benefit profile of the product, and to provide adequate information for the labeling of the product.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and more frequently if serious adverse events occur. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, or at all. Furthermore, 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 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.

Special Protocol Assessment

The special protocol assessment, or SPA, process is designed to facilitate the FDA’s review and approval of drugs by allowing the FDA to evaluate issues related to the adequacy of certain clinical trials, including Phase 3 clinical trials that can form the primary basis for a drug product’s efficacy claim in an NDA. Upon specific request by a clinical trial sponsor, the FDA will evaluate the protocol and respond to a sponsor’s questions regarding, among other things, primary efficacy endpoints, trial conduct and data analysis, within 45 days of receipt of the request.

The FDA ultimately assesses whether the protocol design and planned analysis of the trial are acceptable to support regulatory approval of the product candidate with respect to effectiveness of the indication studied. All agreements and disagreements between the FDA and the sponsor regarding a SPA must be clearly documented in a SPA letter or the minutes of a meeting between the sponsor and the FDA.

27

Table of Contents

Even if the FDA agrees to the design, execution and analyses proposed in protocols reviewed under the SPA process, the FDA may revoke or alter its agreement under the following circumstances:

- public health concerns emerge that were unrecognized at the time of the protocol assessment;
- the director of the review division determines that a substantial scientific issue essential to determining safety or efficacy has been identified after testing has begun;
- a sponsor fails to follow a protocol that was agreed upon with the FDA; or
- the relevant data, assumptions, or information provided by the sponsor in a request for SPA change, are found to be false statements or misstatements, or are found to omit relevant facts.

A documented SPA may be modified, and such modification will be deemed binding on the FDA review division, except under the circumstances described above, if FDA and the sponsor agree in writing to modify the protocol and such modification is intended to improve the study.

Marketing Approval

Assuming successful completion of the required clinical testing, the results of the pre clinical studies and clinical trials, together with detailed information relating to the product's chemistry, manufacture, controls and proposed labeling, among other things, are submitted to the FDA as part of an NDA requesting approval to market the product for one or more indications. In most cases, the submission of an NDA is subject to a substantial application user fee. Under the Prescription Drug User Fee Act ("PDUFA"), guidelines that are currently in effect, the FDA has a goal of ten months from the date of "filing" of a standard NDA for a new molecular entity to review and act on the submission. This review typically takes twelve months from the date the NDA is submitted to FDA because the FDA has approximately two months to make a "filing" decision.

In addition, under the Pediatric Research Equity Act of 2003 ("PREA"), as amended and reauthorized, certain NDAs or supplements to an NDA must contain data that are adequate to assess the safety and effectiveness of the drug for the claimed indications in all relevant pediatric subpopulations; this would include information which supports dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may, on its own initiative or at the request of the applicant, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults or full or partial waivers from the pediatric data requirements.

The FDA may also require submission of a risk evaluation and mitigation strategy, or REMS, plan to ensure that the benefits of the drug outweigh its risks. The REMS plan could include medication guides, physician communication plans, assessment plans, and/or elements to assure safe use, such as restricted distribution methods, patient registries, or other risk minimization tools.

The FDA may also require other information as part of the NDA filing such as an environmental impact statement. The FDA can waive some or delay compliance with some of these requirements.

The FDA conducts a preliminary review of all NDAs within the first 60 days after submission, before accepting them for filing, to determine whether they are sufficiently complete to permit substantive review. The FDA may request additional information rather than accept an NDA for filing. In this event, the application must be resubmitted with the additional information. The resubmitted application is also subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in depth substantive review. The FDA reviews an NDA to determine, among other things, whether the drug is safe and effective and whether the facility in which it is manufactured, processed, packaged or held meets standards designed to assure the product's continued safety, quality and purity.

Table of Contents

The FDA may refer an application for a novel drug to an advisory committee. An advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving an NDA, the FDA typically will inspect the facility or facilities where the product is manufactured. The FDA will not approve an application 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. Additionally, before approving an NDA, the FDA may inspect one or more clinical trial sites to assure compliance with GCP requirements.

After evaluating the NDA and all related information, including the advisory committee recommendation, if any, and inspection reports regarding the manufacturing facilities and clinical trial sites, the FDA may issue an approval letter, or, in some cases, a complete response letter. A complete response letter must contain a statement of specific items that prevent the FDA from approving the application and will also contain conditions that must be met in order to secure final approval of the NDA and may require additional clinical or pre clinical testing in order for FDA to reconsider the application. Even with submission of this additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval. If and when those conditions have been met to the FDA's satisfaction, the FDA will typically issue an approval letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications.

Even if the FDA approves a product, it may limit the approved indications for use of the product, require that contraindications, warnings or precautions be included in the product labeling, require that post approval studies, Phase 4 clinical trials, be conducted to further assess a drug's safety after approval, require testing and surveillance programs to monitor the product after commercialization, or impose other conditions, including distribution and use restrictions or other risk management mechanisms under a REMS, which can materially affect the potential market and profitability of the product. The FDA may prevent or limit further marketing of a product based on the results of post marketing studies or surveillance programs. After approval, some types of changes to the approved product, such as adding new indications, manufacturing changes, and additional labeling claims, are subject to further testing requirements and FDA review and approval.

Post Approval Requirements

Drugs manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, advertising and promotion and reporting of adverse experiences with the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims are subject to prior FDA review and approval. New secondary indications must be supported by clinical trials or data. There also are continuing, annual user fee requirements for any marketed products and the establishments at which such products are manufactured, as well as new application fees for supplemental applications with clinical data.

The FDA may impose a number of post approval requirements as a condition of approval of an NDA. For example, the FDA may require post marketing testing, including Phase 4 clinical trials, and surveillance to further assess and monitor the product's safety and effectiveness after commercialization.

In addition, drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and state agencies, and are subject to periodic unannounced inspections by the FDA and these state agencies for compliance with cGMP requirements. Changes to the

manufacturing process are strictly regulated and often require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP requirements and impose reporting and documentation requirements upon the sponsor and any third party manufacturers that the sponsor may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain cGMP compliance.

Table of Contents

Once an approval is granted, the FDA may withdraw the 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 mandatory revisions to the approved labeling to add new safety information; imposition of post market studies or clinical trials to assess new safety risks; or imposition of distribution or other restrictions under a REMS program. Other potential consequences include, include, but are not limited to:

- 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 trials;
- refusal of the FDA to approve pending NDAs or supplements to approved NDAs, or suspension or revocation of product approvals;
- product seizure or detention, or 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. In addition, the FDA regulates the purity and or consistency of the approved product. Products, if deemed adulterated can lead to serious consequences as set forth above as well as civil and criminal penalties.

Foreign Government Regulation

To the extent that any of Napo's product candidates, once approved, are sold in a foreign country, Napo may be subject to similar foreign laws and regulations, which may include, for instance, applicable post marketing requirements, including safety surveillance, anti fraud and abuse laws and implementation of corporate compliance programs and reporting of payments or other transfers of value to healthcare professionals.

In order to market Napo's future products in the EEA (which is comprised of the 28 Member States of the EU plus Norway, Iceland and Liechtenstein) and many other foreign jurisdictions, a sponsor must obtain separate regulatory approvals. More concretely, in the EEA, medicinal products can only be commercialized after obtaining a Marketing Authorization, or MA. There are two types of marketing authorizations:

- the Community MA, which is issued by the European Commission through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use of the European Medicines Agency, or EMA, and which 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 and medicinal products indicated for the treatment of AIDS, cancer, neurodegenerative disorders, diabetes, auto immune 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; and
- 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 State through the Mutual Recognition

Table of Contents

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 above described procedures, before granting the MA, the 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.

In the EEA, new products authorized for marketing, or reference products, qualify for eight years of data exclusivity and an additional two years of market exclusivity upon marketing authorization. The data exclusivity period prevents generic or biosimilar applicants from relying on the pre clinical and clinical trial data contained in the dossier of the reference product when applying for a generic or biosimilar marketing authorization in the EU during a period of eight years from the date on which the reference product was first authorized in the EU. The market exclusivity period prevents a successful generic or biosimilar applicant from commercializing its product in the EU until 10 years have elapsed from the initial authorization of the reference product in the EU. The 10 year market exclusivity period can be extended to a maximum of eleven years if, during the first eight years of those 10 years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are held to bring a significant clinical benefit in comparison with existing therapies.

In the EEA, marketing authorization applications for new medicinal products not authorized have to include the results of studies conducted in the pediatric population, in compliance with a pediatric investigation plan, or PIP, agreed with the EMA's Pediatric Committee ("PDCO"). The PIP sets out the timing and measures proposed to generate data to support a pediatric indication of the drug for which marketing authorization is being sought. The PDCO can grant a deferral of the obligation to implement some or all of the measures of the PIP until there are sufficient data to demonstrate the efficacy and safety of the product in adults. Further, the obligation to provide pediatric clinical trial data can be waived by the PDCO when these data is not needed or appropriate because the product is likely to be ineffective or unsafe in children, the disease or condition for which the product is intended occurs only in adult populations, or when the product does not represent a significant therapeutic benefit over existing treatments for pediatric patients. Once the marketing authorization is obtained in all Member States of the EU and study results are included in the product information, even when negative, the product is eligible for six months' supplementary protection certificate extension. For orphan drug designated medicinal products, the 10 year period of market exclusivity is extended to 12 years.

Other U.S. Healthcare Laws

In addition to FDA restrictions on marketing of pharmaceutical and biological products, other U.S. federal and state healthcare regulatory laws restrict business practices in the pharmaceutical industry, which include, but are not limited to, state and federal anti kickback, false claims, data privacy and security and physician payment and drug pricing transparency laws.

The U.S. federal Anti Kickback Statute prohibits, among other things, any person or entity from knowingly and willfully offering, paying, soliciting, receiving or providing any remuneration, directly or indirectly, overtly or covertly, to induce or in return for purchasing, leasing, ordering, or arranging for or recommending the purchase, lease, or order of any good, facility, item or service reimbursable, in whole or in part, under Medicare, Medicaid or other federal healthcare programs. The term "remuneration" has been broadly interpreted to include anything of value. The Anti Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers, formulary managers and beneficiaries on the other. Although there are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution, the exceptions and safe harbors are drawn narrowly. Practices that involve remuneration that may be alleged to be intended to induce prescribing, purchases, or recommendations may be subject to scrutiny if they do not meet the requirements of a statutory or regulatory exception or safe harbor. Failure to meet all of the requirements of a

particular applicable statutory exception or regulatory safe harbor does not make the conduct per se illegal under the U.S. federal Anti Kickback Statute. Instead, the legality of the arrangement will be evaluated on a case by case basis based on a cumulative review of all its facts and circumstances. Several courts have interpreted the statute's intent requirement to

Table of Contents

mean that if any one purpose of an arrangement involving remuneration is to induce referrals of federal healthcare covered business, the statute has been violated.

Additionally, the intent standard under the U.S. federal Anti Kickback Statute was amended by the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively, the ACA, to a stricter standard such that a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. In addition, the ACA codified case law that a claim including items or services resulting from a violation of the U.S. federal Anti Kickback Statute constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act. The majority of states also have anti kickback laws, which establish similar prohibitions and in some cases may apply to items or services reimbursed by any third party payor, including commercial insurers.

The federal false claims and civil monetary penalties laws, including the civil False Claims Act, prohibit any person or entity from, among other things, knowingly presenting, or causing to be presented, a false, fictitious or fraudulent claim for payment to, or approval by, the federal government, knowingly making, using, or causing to be made or used a false record or statement material to a false or fraudulent claim to the federal government, or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the U.S. federal government. A claim includes “any request or demand” for money or property presented to the U.S. government. Actions under the civil False Claims Act may be brought by the Attorney General or as a qui tam action by a private individual in the name of the government. Violations of the civil False Claims Act can result in very significant monetary penalties and treble damages. Several pharmaceutical and other healthcare companies have been prosecuted under these laws for, among other things, allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. Other companies have been prosecuted for causing false claims to be submitted because of the companies’ marketing of products for unapproved, or off label, uses. Companies also have been prosecuted for allegedly violating the Anti Kickback Statute and False Claims Act as a result of impermissible arrangements between companies and healthcare practitioners or as a result of the provision of remuneration by the companies to the healthcare practitioners. In addition, the civil monetary penalties statute imposes penalties against any person who is determined to have presented or caused to be presented a claim to a federal health program that the person knows or should know is for an item or service that was not provided as claimed or is false or fraudulent. Many states also have similar fraud and abuse statutes or regulations that apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor.

Violations of fraud and abuse laws, including federal and state anti kickback and false claims laws, may be punishable by criminal and civil sanctions, including fines and civil monetary penalties, the possibility of exclusion from federal healthcare programs (including Medicare and Medicaid), disgorgement and corporate integrity agreements, which impose, among other things, rigorous operational and monitoring requirements on companies. Similar sanctions and penalties, as well as imprisonment, also can be imposed upon executive officers and employees of such companies. Given the significant size of actual and potential settlements, it is expected that the government authorities will continue to devote substantial resources to investigating healthcare providers’ and manufacturers’ compliance with applicable fraud and abuse laws.

The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, created additional federal criminal statutes that prohibit, among other actions, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third party payors, knowingly and willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense and knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. Similar to the U.S. federal Anti Kickback Statute, the ACA broadened the reach of certain criminal healthcare fraud statutes created under HIPAA by amending the intent requirement such that a person or entity does not need to

have actual knowledge of the statute or specific intent to violate it in order to have committed a violation.

In addition, there has been a recent trend of increased federal and state regulation of payments made to physicians and certain other healthcare providers. The ACA imposed, among other things, new annual reporting requirements through the Physician Payments Sunshine Act for covered manufacturers for certain payments and

Table of Contents

"transfers of value" provided to physicians and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members. Failure to submit timely, accurately and completely the required information for all payments, transfers of value and ownership or investment interests may result in civil monetary penalties of up to an aggregate of $150,000 per year and up to an aggregate of $1 million per year for "knowing failures." Covered manufacturers must submit reports by the 90th day of each subsequent calendar year. In addition, certain states require implementation of compliance programs and compliance with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, impose restrictions on marketing practices and/or tracking and reporting of gifts, compensation and other remuneration or items of value provided to physicians and other healthcare professionals and entities.

Napo may also be subject to data privacy and security regulation by both the federal government and the states in which Napo conducts its business. HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, and their respective implementing regulations, including the Final HIPAA Omnibus Rule published on January 25, 2013, impose specified requirements relating to the privacy, security and transmission of individually identifiable health information held by covered entities and their business associates. Among other things, HITECH made HIPAA's security standards directly applicable to "business associates," defined as independent contractors or agents of covered entities that create, receive, maintain or transmit protected health information in connection with providing a service for or on behalf of a covered entity. HITECH also increased the civil and criminal penalties that may be imposed against covered entities, business associates and possibly other persons, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorney's fees and costs associated with pursuing federal civil actions. In addition, state laws govern the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and may not have the same requirements, thus complicating compliance efforts.

Coverage and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any pharmaceutical products for which Napo obtains regulatory approval. In the United States and markets in other countries, patients who are prescribed treatments for their conditions and providers performing the prescribed services generally rely on third party payors to reimburse all or part of the associated healthcare costs. Patients are unlikely to use Napo's products unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of Napo's products. Sales of any products for which Napo receives regulatory approval for commercial sale will therefore depend, in part, on the availability of coverage and adequate reimbursement from third party payors. Third party payors include government authorities, managed care plans, private health insurers and other organizations. In the United States, the process for determining whether a third party payor will provide coverage for a pharmaceutical or biological product typically is separate from the process for setting the price of such product or for establishing the reimbursement rate that the payor will pay for the product once coverage is approved. Third party payors may limit coverage to specific products on an approved list, also known as a formulary, which might not include all of the FDA approved products for a particular indication. A decision by a third party payor not to cover Napo's product candidates could reduce physician utilization of Napo's products once approved and have a material adverse effect on Napo's sales, results of operations and financial condition. Moreover, a third party payor's decision to provide coverage for a pharmaceutical or biological product does not imply that an adequate reimbursement rate will be approved. Adequate third party reimbursement may not be available to enable Napo to maintain price levels sufficient to realize an appropriate return on Napo's investment in product development. Additionally, coverage and reimbursement for products can differ significantly from payor to payor. One third party payor's decision to cover a particular medical product or service does not ensure that other payors will also provide coverage for the medical product or service, or will provide coverage at an adequate reimbursement rate. As a result, the coverage determination process will require Napo to provide scientific and clinical support for the use of Napo's products to each payor separately and will be a time consuming process.

In the EEA, governments influence the price of products through their pricing and reimbursement rules and control of national health care systems that fund a large part of the cost of those products to consumers. Some jurisdictions operate positive and negative list systems under which products may only be marketed once a reimbursement price has been agreed to by the government. To obtain reimbursement or pricing approval, some of these countries may require the completion of clinical trials that compare the cost effectiveness of a particular product

Table of Contents

candidate to currently available therapies. Other member states allow companies to fix their own prices for medicines, but monitor and control company profits. The downward pressure on health care costs in general, particularly prescription products, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross border imports from low priced markets exert a commercial pressure on pricing within a country.

The containment of healthcare costs has become a priority of federal, state and foreign governments, and the prices of pharmaceutical or biological products have been a focus in this effort. Third party payors are increasingly challenging the prices charged for medical products and services, examining the medical necessity and reviewing the cost effectiveness of pharmaceutical or biological products, medical devices and medical services, in addition to questioning safety and efficacy. If these third party payors do not consider Napo's products to be cost effective compared to other available therapies, they may not cover Napo's products after FDA approval or, if they do, the level of payment may not be sufficient to allow Napo to sell its products at a profit.

Healthcare Reform

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and other third party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medical products. For example, in March 2010, the ACA was enacted, which, among other things, increased the minimum Medicaid rebates owed by most manufacturers under the Medicaid Drug Rebate Program; introduced 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; extended the Medicaid Drug Rebate Program to utilization of prescriptions of individuals enrolled in Medicaid managed care plans; imposed mandatory discounts for certain Medicare Part D beneficiaries as a condition for manufacturers' outpatient drugs coverage under Medicare Part D; subjected drug manufacturers to new annual fees based on pharmaceutical companies' share of sales to federal healthcare programs; created a new Patient Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; creation of the Independent Payment Advisory Board, once empaneled, will have authority to recommend certain changes to the Medicare program that could result in reduced payments for prescription drugs; and establishment of a Center for Medicare Innovation at the CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending. Since its enactment, the U.S. federal government has delayed or suspended implementation of certain provisions of the ACA. In addition, there have been judicial and Congressional challenges to certain aspects of the ACA, and Napo expects there will be additional challenges and amendments to the ACA in the future. For example, in January 2017, the U.S. House of Representatives and Senate passed legislation, which, if signed into law, would repeal certain aspects of the ACA. In addition, Congress could consider subsequent legislation to replace those elements of the ACA if so repealed.

Napo expects that the ACA, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and lower reimbursement, and additional downward pressure on the price that Napo receives for any approved product. Any reduction in reimbursement from Medicare or other government funded programs may result in a similar reduction in payments from private payors. Moreover, recently there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products. The implementation of cost containment measures or other healthcare reforms may prevent Napo from being able to generate revenue, attain profitability or commercialize Napo's drugs.

Additionally, on August 2, 2011, the Budget Control Act of 2011 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 included aggregate reductions of Medicare

payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, will stay in effect through 2025 unless additional action is taken by Congress. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several types of providers, including hospitals, imaging centers and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. More recently, there has been heightened governmental scrutiny recently over the manner in which manufacturers set prices

Table of Contents

for their marketed products, which have resulted in several recent Congressional inquiries and proposed bills 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 pharmaceutical products.

Napo expects 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 Napo's products once approved or additional pricing pressures.

Animal Health Business

The development, approval and sale of animal health products are governed by the laws and regulations of each country in which we intend to seek approval, where necessary, to market and subsequently sell our prescription drug and non drug products. To comply with these regulatory requirements, we are establishing processes and resources to provide oversight of the development, approval processes and launch of its products and to position those products in order to gain market share in each respective market.

Certain U.S. federal regulatory agencies are charged with oversight and regulatory authority of animal health products in the United States. These agencies, depending on the product and its intended use may include the FDA, the USDA and the Environmental Protection Agency. The approval of prescription drugs intended for animal use is regulated by the FDA's Center for Veterinary Medicine ("CVM"). In addition, the Drug Enforcement Administration regulates animal therapeutics that are classified as controlled substances. In addition, the Federal Trade Commission may in the case of non drug products, regulate the marketing and advertising claims being made.

Marketing Exclusivity

We are currently planning on seeking MUMS designation for some of our prescription drug products and if we receive such a designation, we will be entitled to a seven year marketing exclusivity, which means that we will face no competition from another sponsor marketing the same drug in the same dosage form for the same intended use. If we were to lose such designation or not receive such designation but our application as a new animal drug is found to be a new chemical entity that meets the criteria described by the FDA, we would be entitled to a five year marketing exclusivity. In order to receive this five year exclusivity, the FDA would have to find in its approval of our application that our NADA contains an API not previously approved in another application, that the application itself is an original application, not a supplemental application, and that our application included the following studies: one or more investigations to demonstrate substantial evidence of effectiveness of the drug for which we are seeking approval; animal safety studies and human food safety studies (where applicable). If the NADA is seeking approval of a drug for which we have received conditional approval, we, upon approval would still be entitled to a five year marketing exclusivity provided we meet the criteria as set forth above. If, however, our NADA is for a drug for which the FDA has determined that the drug contains an API that has previously been approved, regardless of whether the original approval was for use in humans or not, we may only be entitled to a three year marketing exclusivity provided that the NADA is an original, not supplemental, application and contains both safety and efficacy studies demonstrating the safety and efficacy of the drug which is the subject of the application. We have received MUMS designation for Canalevia for the indication of chemotherapy induced diarrhea, or CID, in dogs. Additionally, the FDA has indicated that the use of Canalevia for the treatment of EID in dogs qualifies as a "minor use", which means that Canalevia is eligible for conditional approval for the indication of EID in dogs.

Labeling

The FDA plays a significant role in regulating the labeling, advertising and promotion of animal drugs. This is also true of regulatory agencies in the EU and other territories. In addition, advertising and promotion of animal health products is controlled by regulations in many countries. These rules generally restrict advertising and promotion to those claims and uses that have been reviewed and approved by the applicable agency. We will conduct a review of advertising

Table of Contents

and promotional material for compliance with the local and regional requirements in the markets where we eventually may sell its product candidates.

Other Regulatory Considerations

We believe regulatory rules relating to human food safety, food additives, or drug residues in food will not apply to the products we currently are developing because our animal prescription drug product candidates are not intended for use in production animals, with the exception of horses, which qualify as food animals in Europe and Canada; and our non prescription products are not regulated by section 201(g) of the Federal Food, Drug, and Cosmetic Act, which the FDA is authorized to administer.

Our animal prescription drug product candidates currently in development, if approved, may eventually face generic competition in the United States and in the EU after the period of exclusivity has expired. In the United States, a generic animal drug may be approved pursuant to an abbreviated new animal drug application (ANADA). With an ANADA, a generic applicant is not subject to the submission of new clinical and safety data but instead must only show that the proposed generic product is a copy of the novel drug product, and bioequivalent to the approved novel product. However, if our product candidates are the first approved by the FDA or the EMA as applicable for use in animals, they will be eligible for a five year marketing exclusivity in the United States and 10 years in the EU thereby prohibiting generic entry into the market. If the product has MUMS designation it has a seven year marketing exclusivity.

We do not believe that our animal non prescription products are currently subject to regulation in the United States. The CVM only regulates those animal supplements that fall within the FDA's definition of an animal drug, food or feed additive. The Federal Food Drug and Cosmetic Act defines food as "articles used for food or drink for man or other animals and articles used as components of any such article." Animal foods are not subject to pre market approval and are designed to provide a nutritive purpose to the animals that receive them. Feed additives are defined as those articles that are added to an animal's feed or water as illustrated by the guidance documents. Our non prescription products are not added to food, are not ingredients in food nor are they added to any animal's drinking water. Therefore, our non prescription products do not fall within the definition of a food or feed additive. The FDA seeks to regulate such supplements as food or food additives depending on the intended use of the product. The intended use is demonstrated by how the article is included in a food, or added to the animals' intake (i.e., through its drinking water). If the intended use of the product does not fall within the proscribed use making the product a food, it cannot be regulated as a food. There is no intent to make our non prescription products a component of an animal food, either directly or indirectly. A feed additive is a product that is added to a feed for any reason including the top dressing of an already prepared feed. Some additives, such as certain forage, are deemed to be Generally Recognized as Safe ("GRAS"), and therefore, not subject to a feed Additive Petition approval prior to use. However, the substances deemed GRAS are generally those that are recognized as providing nutrients as a food does. We do not believe that our non prescription products fit within this framework either. Finally, a new animal drug refers to drugs intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in animals. Our non prescription products are not intended to diagnose, cure, mitigate, treat or prevent disease and therefore, do not fit within the definition of an animal drug. Our non prescription products are intended to support a healthy gut, support fluid retention, and normalize stool formation in animals suffering from scours. Additionally, because a previously marketed human formulation of the botanical extract in our non prescription products was considered a dietary supplement subject to the Dietary Supplement Health and Education Act of 1994 (and not regulated as a drug by the FDA), we do not believe that the FDA would regulate the animal formulation used in our non prescription products in a different manner. We do not believe that our non prescription products fit the definition of an animal drug, food or food additive and therefore are not regulated by the FDA at this time.

In addition to the foregoing, we may be subject to state, federal and foreign healthcare and/or veterinary medicine laws, including but not limited to anti kickback laws, as we may from time to time enter consulting and other financial arrangements with veterinarians, who may prescribe or recommend our products. If our financial relationships with veterinarians are found to be in violation of such laws that apply to us, we may be subject to penalties.

Table of Contents

Legal Proceedings

From time to time, we may become involved in litigation relating to claims arising from the ordinary course of business. Other than as set forth below, there are currently no claims or actions pending against us, the ultimate disposition of which could have a material adverse effect on our results of operations, financial condition or cash flows.

March 2018 Demand Letter relating to 2018 Special Meeting of Stockholders

While not a legal proceeding, on March 27, 2018, we received a demand letter from a law firm representing a purported stockholder, relating to certain approvals obtained at a special meeting of stockholders on March 12, 2018 (the "2018 Special Meeting"). The demand letter alleges that we miscalculated the votes with respect to (i) the proposal to amend our Third Amended and Restated Certificate of Incorporation as filed with Secretary of State of the State of Delaware on March 15, 2018 (the "COI"), which increased the authorized shares of Common Stock from 250,000,000 to 500,000,000 (the "Share Increase Proposal") and (ii) the proposal to amend the COI to effect a reverse stock split at a ratio of not less than 1 for 1.2 and not greater than 1 for 10 (the "Former Reverse Stock Split Proposal").We did not implement the Former Reverse Stock Split Proposal. In addition, at the 2018 annual meeting of stockholders held on May 18, 2018, stockholders approved amendments to the COI to (i) effect a reverse stock split at a ratio of not less than 1 for 11 and not greater than 1 for 15 and (ii) decrease the number of authorized shares of Common Stock to 150,000,000.

On September 5, 2018, we responded to the law firm, indicating that the Board unanimously rejected the demands set forth in the demand letter (the "Demand Letter Claims"). While no proceedings with respect to the demand letter were ever initiated, we believe that the allegations set forth in the demand letter were without merit and we would have vigorously defended against any such proceeding. The Demand Letter Claims were settled with a release of all such claims in March 2019 without any material financial settlement costs incurred by us.

July 2017 Complaint Relating to the Merger

On July 20, 2017, a putative class action complaint was filed in the United States District Court, Northern District of California, Civil Action No. 3:17 cv 04102, by Tony Plant (the "Plaintiff") on behalf of shareholders of the Company who held shares on September 30, 2017 and were entitled to vote at the 2017 Special Shareholders Meeting, against the Company and certain individuals who were directors as of the date of the vote (collectively, the "Defendants"), in a matter captioned Tony Plant v. Jaguar Animal Health, Inc., et al., making claims arising under Section 14(a) and Section 20(a) of the Exchange Act and Rule 14a 9, 17 C.F.R. § 240.14a 9, promulgated thereunder by the SEC. The claims alleged false and misleading information provided to investors in the Joint Proxy Statement/Prospectus on Form S 4 (File No. 333 217364) declared effective by the SEC on July 6, 2017 related to the solicitation of votes from shareholders to approve the merger and certain transactions related thereto. We accepted service of the complaint and summons on behalf of itself and the United States based director Defendants on November 1, 2017. We have not accepted service on behalf of, and Plaintiff has not yet served, the non U.S. based director Defendants.

On October 3, 2017, Plaintiff filed a motion seeking appointment as lead plaintiff and appointment of Monteverde & Associates PC as lead counsel. That motion was granted. Plaintiff filed an amended complaint against the Company and the United States based director Defendants on January 10, 2018. The Defendants filed a motion to dismiss on March 12, 2018, for which oral arguments were held on June 14, 2018. The court dismissed the complaint on September 20, 2018. Plaintiff was entitled to amend the complaint within 20 days from the date of dismissal. On October 10, 2018, Plaintiff amended the complaint to focus on our commercial strategy in support of Equilevia and the related disclosure statements in the Form S 4 described above. On November 6, 2018, the Defendants moved to dismiss the second amended complaint. The Defendants argue in their motion that the complaint fails to state a claim

upon which relief can be granted because the omissions and misrepresentations alleged in the complaint are immaterial as a matter of law. The court has elected to rule on Defendants' motion to dismiss without holding oral arguments. If the Plaintiff were able to prove its allegations in this matter and to establish the damages it asserts, then an adverse ruling could have a material impact on us. We believe that it is not probable that an asset has been impaired or a liability has been incurred as of the date of the financial statements and the amount of any potential loss is not reasonably estimable.

Table of Contents

Corporate Information

We were incorporated in the State of Delaware on June 6, 2013. Our principal executive offices are located at 201 Mission Street, Suite 2375, San Francisco, CA 94015 and our telephone number is (415) 371 8300. Our website address is www.jaguar.health. The information contained on, or that can be accessed through, our website is not part of this prospectus. Our voting common stock is listed on the NASDAQ Capital Market and trades under the symbol "JAGX." On July 31, 2017, we completed the acquisition of Napo pursuant to the Agreement and Plan of Merger, dated March 31, 2017, by and among the Company, Napo, Napo Acquisition Corporation, and Napo's representative.

Employees

As of December 31, 2018, we had 40 employees. Six employees hold D.V.M. or Ph.D. degrees. 13 of our employees are engaged in research and development activities and 20 employees are engaged in sales and marketing. None of our employees are represented by labor unions or covered by collective bargaining agreements.

Description of Properties

Our corporate headquarters are located in San Francisco, California, where we lease 6,311 rentable square feet of office space from CA Mission Street Limited Partnership. Our lease agreement expires on September 30, 2020. We believe that our existing facilities are adequate for our near term needs.

ITEM 1A. RISK FACTORS

The business, financial condition and operating results of the Company may be affected by a number of factors, whether currently known or unknown, including but not limited to those described below. Any one or more of such factors could directly or indirectly cause the Company's actual results of operations and financial condition to vary materially from past or anticipated future results of operations and financial condition. Any of these factors, in whole or in part, could materially and adversely affect the Company's business, financial condition, results of operations and stock price. The following information should be read in conjunction with Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and the consolidated financial statements and related notes in Part II, Item 8, "Financial Statements and Supplementary Data" of this Annual Report.

Risks Related to Our Business

We have a limited operating history, expect to incur further losses as we grow and may be unable to achieve or sustain profitability. Our independent registered public accounting firm has expressed substantial doubt about our ability to continue as a going concern.

Since formation in June 2013, our operations have been primarily limited to the research and development of our animal prescription drug product candidate, Canalevia, to treat various forms of diarrhea in dogs, our non prescription product, Neonorm Calf, to help dairies and calf farms proactively retain fluid in calves, the ongoing commercialization of Neonorm Foal, our antidiarrheal for newborn horses, and Equilevia, our non-prescription, personalized, premium product for total gut health in high performance equine athletes. Since the consummation of the Merger on July 31, 2017, our operations have also been heavily focused on research, development and the ongoing commercialization of our lead prescription drug product candidate, Mytesi, which is approved by the U.S. FDA for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy. As a result, we have limited meaningful historical operations upon which to evaluate our business and prospects and have not yet

demonstrated an ability to broadly commercialize any of our animal health products, obtain any required marketing approval for any of our animal prescription drug product candidates or successfully overcome the risks and uncertainties frequently encountered by companies in emerging fields such as the animal health industry or the gastrointestinal health industry in general. We also have not generated any material revenue to date, and expect to continue to incur significant research and development and other expenses. Our net loss and comprehensive loss for the year ended December 31, 2018 was $32.1 million. As of December 31, 2018, we had total stockholders' equity of $5.4 million. We expect to

Table of Contents

continue to incur losses for the foreseeable future, which will increase significantly from historical levels as we expand our product development activities, seek necessary approvals for our human and veterinary drug product candidates, conduct species specific formulation studies for our non prescription products and begin commercialization activities. Even if we succeed in developing and broadly commercializing one or more of our products or product candidates, we expect to continue to incur losses for the foreseeable future, and we may never become profitable. If we fail to achieve or maintain profitability, then we may be unable to continue our operations at planned levels and be forced to reduce or cease operations.

As more fully discussed in Note 1 to our financial statements, we believe there is substantial doubt about our ability to continue as a going concern as we do not currently have sufficient cash resources to fund our operations through March 31, 2020, or one year from the filing date of our Form 10 K. Our financial statements do not include any adjustments that may result from the outcome of this uncertainty. If we are unable to continue as a viable entity, our stockholders may lose their entire investment.

We currently generate limited revenue from the sale of products and may never become profitable.

We are a pharmaceuticals company focused on the development and commercialization of novel, sustainably derived gastrointestinal products for both human prescription use and animals on a global basis. Napo, our wholly owned subsidiary, began the commercial pre launch activities of our first FDA-approved product, Mytesi, in February 2017. Accordingly, we have only generated limited revenue from product sales. There is no guarantee that our ongoing commercialization efforts for Neonorm Calf for preweaned dairy calves in the United States and Neonorm Foal for newborn horses in the United States will be successful or that we will be able to generate a consistent revenue stream from the sale of any of these products in the future. Further, in order to commercialize our other prescription drug product candidates, we must receive regulatory approval from the FDA in the United States and other regulatory agencies in various jurisdictions. Other than Mytesi, we have not yet received any regulatory approvals for our prescription drug product candidates. In addition, certain of our non prescription products, such as Neonorm Calf, may be subject to regulatory approval outside the United States prior to commercialization in other countries. Accordingly, until and unless we receive any necessary regulatory approvals, we cannot market or sell our products in many regions. Moreover, even if we receive the necessary approvals, we may not be successful in generating revenue from sales of our products as we do not have any meaningful experience marketing or distributing our products. Accordingly, we may never generate any material revenue from our operations.

We expect to incur significant additional costs as we continue commercialization efforts for current prescription drug candidates, Neonorm, or other product candidates, and undertake the clinical trials necessary to obtain any necessary regulatory approvals, which will increase our losses.

Napo commenced sales of Mytesi for adults with HIV/AIDS on antiretroviral therapy in February 2017. We will need to continue to invest in developing our internal and third party sales and distribution network and outreach efforts to key opinion leaders in the gastrointestinal health industry, including physicians as applicable.

We are actively identifying additional products for development and commercialization, and will continue to expend substantial resources for the foreseeable future to develop Mytesi and lechlemerThese expenditures will include costs associated with:

- identifying additional potential prescription drug product candidates and non prescription products;
- formulation studies;
- conducting pilot, pivotal and toxicology studies;
- completing other research and development activities;
- payments to technology licensors;

39

Table of Contents

- maintaining our intellectual property;
- obtaining necessary regulatory approvals;
- establishing commercial supply capabilities; and
- sales, marketing and distribution of our commercialized products.

We also may incur unanticipated costs in connection with developing and commercializing our products. Because the outcome of our development activities and commercialization efforts is inherently uncertain, the actual amounts necessary to successfully complete the development and commercialization of our current or future products and product candidates may be greater than we anticipate.

Because we anticipate incurring significant costs for the foreseeable future, if we are not successful in broadly commercializing any of our current or future products or product candidates or raising additional funding to pursue our research and development efforts, we may never realize the benefit of our development efforts and our business may be harmed.

We will need to raise substantial additional capital in the future in the event that we conduct clinical trials for new indications and we may be unable to raise such funds when needed and on acceptable terms, which would force us to delay, limit, reduce or terminate one or more of our product development programs.

We are forecasting continued losses and negative cash flows as we continue to fund our operating and marketing activities and research and development programs, and we will not have sufficient cash on hand to fund our operating plan through March 31, 2020 and to complete the development of all the current products in our pipeline, or any additional products we may identify. We will need to seek additional funds sooner than planned through public or private equity or debt financings or other sources such as strategic collaborations. Any such financings or collaborations may result in dilution to our stockholders, the imposition of debt covenants and repayment obligations or other restrictions that may harm our business or the value of our common stock. We may also seek from time to time to raise additional capital based upon favorable market conditions or strategic considerations such as potential acquisitions or potential license arrangements.

Our future capital requirements depend on many factors, including, but not limited to:

- the scope, progress, results and costs of researching and developing our current and future prescription drug product candidates and non prescription products;
- the timing of, and the costs involved in, obtaining any regulatory approvals for our current and any future products;
- the number and characteristics of the products we pursue;
- the cost of manufacturing our current and future products and any products we successfully commercialize;
- the cost of commercialization activities for Mytesi, Neonorm, Equilevia and Canalevia, if approved, including sales, marketing and distribution costs;
- the expenses needed to attract and retain skilled personnel;
- the costs associated with being a public company;

Table of Contents

- our ability to establish and maintain strategic collaborations, distribution or other arrangements and the financial terms of such agreements; and
- the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing possible patent claims, including litigation costs and the outcome of any such litigation.

Additional funds may not be available when we need them on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, we may be required to delay, limit, reduce or terminate one or more of our product development programs or future commercialization efforts.

We are substantially dependent on the success of our current lead prescription drug product candidates, Mytesi and Canalevia, and our non prescription products, Equilevia and Neonorm, and cannot be certain that necessary approvals will be received for planned Mytesi follow on indications or Canalevia or that these product candidates will be successfully commercialized, either by us or any of our partners.

Other than Mytesi, we currently do not have regulatory approval for any of our prescription drug product candidates, including Canalevia. Our current efforts are primarily focused on the ongoing commercialization of Mytesi, and development efforts related to Mytesi, Equilevia, and Canalevia. With regard to Mytesi, we are focused on the commercial launch of the product in the United States as well as on development efforts related to a follow on indication for Mytesi in CTD, an important supportive care indication for patients undergoing primary or adjuvant chemotherapy for cancer treatment. Mytesi is in development for multiple possible follow on indications, including diarrhea related to targeted cancer therapy; orphan drug indications for infants and children with congenital diarrheal disorders and short bowel syndrome (SBS); supportive care for inflammatory bowel disease (IBD); irritable bowel syndrome (IBS); and for idiopathic/functional diarrhea. In addition, a second generation proprietary anti secretory agent is in development for cholera. Mytesi has received orphan drug designation for SBS. Accordingly, our near term prospects, including our ability to generate material product revenue, obtain any new financing if needed to fund our business and operations or enter into potential strategic transactions, will depend heavily on the success of Mytesi, as well as on Canalevia, if Canalevia is approved.

Substantial time and capital resources have been previously devoted by third parties in the development of crofelemer, the active pharmaceutical ingredient, or API, in Mytesi and Canalevia, and the development of the botanical extract used in Equilevia and Neonorm. Both crofelemer and the botanical extract used in Equilevia and Neonorm were originally developed at Shaman Pharmaceuticals, Inc. (“Shaman”), by certain members of our management team, including Lisa A. Conte, our chief executive officer and president, and Steven R. King, Ph.D., our executive vice president of sustainable supply, ethnobotanical research and intellectual property and secretary. Shaman spent significant development resources before voluntarily filing for bankruptcy in 2001 pursuant to Chapter 11 of the U.S. Bankruptcy Code. The rights to crofelemer and the botanical extract used in Equilevia and Neonorm, as well as other intellectual property rights, were subsequently acquired by Napo from Shaman in 2001 pursuant to a court approved sale of assets. Ms. Conte founded Napo in 2001 and was the current interim chief executive officer of Napo and a member of Napo’s board of directors prior to the Merger. While at Napo, certain members of our management team, including Ms. Conte and Dr. King, continued the development of crofelemer. In 2005, Napo entered into license agreements with Glenmark and Luye Pharma Group Limited for rights to various human indications of crofelemer in certain territories as defined in the respective license agreements with these licensees. Subsequently, after expending significant sums developing crofelemer, including trial design and on going patient enrollment in the final pivotal Phase 3 trial for crofelemer for non infectious diarrhea in adults with HIV/AIDS on antiretroviral therapy, in late 2008, Napo entered into a collaboration agreement with Salix Pharmaceuticals, Inc., or Salix, for development and commercialization rights to certain indications worldwide and certain rights in North America, Europe, and Japan, to crofelemer for human use. In January 2014, Jaguar entered into the Napo License Agreement pursuant to which Jaguar acquired an exclusive worldwide license to Napo’s intellectual property rights and technology, including crofelemer and the botanical extract used in Equilevia and Neonorm, for all veterinary treatment uses and indications for all species of animals. In February 2014, most of the executive officers of Napo, and substantially all Napo’s

employees, became Jaguar's employees. Following the merger of Jaguar and Napo in July 2017, Napo became Jaguar's wholly owned

Table of Contents

subsidiary. If we are not successful in the development and commercialization of Mytesi, Neonorm, Equilevia and Canalevia, our business and our prospects will be harmed.

The successful development and commercialization of Mytesi, Equilevia, and, if approved, Canalevia will depend on a number of factors, including the following:

- the successful completion of the pivotal trials and toxicology studies for Canalevia, which may take significantly longer than we currently anticipate and will depend, in part, upon the satisfactory performance of third party contractors;
- our ability to demonstrate to the satisfaction of the FDA and any other regulatory bodies, the safety and efficacy of Canalevia;
- our ability and that of our contract manufacturers to manufacture supplies of Mytesi, Equilevia and Canalevia and to develop, validate and maintain viable commercial manufacturing processes that are compliant with current good manufacturing practices, or cGMP, if required;
- our ability to successfully launch Mytesi, whether alone or in collaboration with others;
- our ability to successfully launch Canalevia, assuming approval is obtained, and Equilevia, whether alone or in collaboration with others;
- the availability, perceived advantages, relative cost, relative safety and relative efficacy of our prescription drug product candidates and non prescription products compared to alternative and competing treatments;
- the acceptance of our prescription drug product candidates and non prescription products as safe and effective by physicians, veterinarians, patients, animal owners and the human and animal health community, as applicable;
- our ability to achieve and maintain compliance with all regulatory requirements applicable to our business; and
- our ability to obtain and enforce our intellectual property rights and obtain marketing exclusivity for our prescription drug product candidates and non prescription products, and avoid or prevail in any third party patent interference, patent infringement claims or administrative patent proceedings initiated by third parties or the U.S. Patent and Trademark Office (“USPTO”).

Many of these factors are beyond our control. Accordingly, we may not be successful in developing or commercializing Mytesi, Neonorm, Equilevia, Canalevia or any of our other potential products. If we are unsuccessful or are significantly delayed in developing and commercializing Mytesi, Equilevia, Canalevia or any of our other potential products, our business and prospects will be harmed and you may lose all or a portion of the value of your investment in our common stock.

If we are not successful in identifying, licensing, developing and commercializing additional product candidates and products, our ability to expand our business and achieve our strategic objectives could be impaired.

Although a substantial amount of our efforts is focused on the commercial performance of Mytesi, Equilevia, and the continued development and potential approval of Canalevia, a key element of our strategy is to identify, develop and commercialize a portfolio of products to serve the gastrointestinal health market. Most of our potential products are based on our knowledge of medicinal plants. Our current focus is primarily on product candidates whose active pharmaceutical ingredient or botanical extract has been successfully commercialized or demonstrated to be safe and effective in human or animal trials. In some instances, we may be unable to further develop these potential products

Table of Contents

because of perceived regulatory and commercial risks. Even if we successfully identify potential products, we may still fail to yield products for development and commercialization for many reasons, including the following:

- competitors may develop alternatives that render our potential products obsolete;
- an outside party may develop a cure for any disease state that is the target indication for any of our planned or approved drug products;
- potential products we seek to develop may be covered by third party patents or other exclusive rights;
- a potential product may on further study be shown to have harmful side effects or other characteristics that indicate it is unlikely to be effective or otherwise does not meet applicable regulatory criteria;
- a potential product may not be capable of being produced in commercial quantities at an acceptable cost, or at all; and
- a potential product may not be accepted as safe and effective by physicians, veterinarians, patients, animal owners, key opinion leaders and other decision makers in the gastrointestinal health market, as applicable.

While we are developing specific formulations, including flavors, methods of administration, new patents and other strategies with respect to our current potential products, we may be unable to prevent competitors from developing substantially similar products and bringing those products to market earlier than we can. If such competing products achieve regulatory approval and commercialization prior to our potential products, our competitive position may be impaired. If we fail to develop and successfully commercialize other potential products, our business and future prospects may be harmed and we will be more vulnerable to any problems that we encounter in developing and commercializing our current potential products.

Mytesi faces significant competition from other pharmaceutical companies, both for its currently approved indication and for planned follow on indications, and our operating results will suffer if we fail to compete effectively.

The development and commercialization of products for human gastrointestinal health is highly competitive and our success depends on our ability to compete effectively with other products in the market. During the ongoing commercialization of Mytesi for its currently approved indication, and during the future commercialization of Mytesi for any planned follow on indications, if such follow on indications receive regulatory approval, we expect to compete with major pharmaceutical and biotechnology companies that operate in the gastrointestinal space, such as Sucampo AG, Takeda Pharmaceuticals, Allergan, Inc., Ironwood Pharmaceuticals, Inc., Synergy Pharmaceuticals Inc., Heron Therapeutics, Inc., Sebela Pharmaceuticals, Inc. and Salix Pharmaceuticals.

Many of our competitors and potential competitors in the human gastrointestinal space have substantially more financial, technical and human resources and greater ability to lower costs of manufacturing and sales and marketing than we do. Many also have more experience in the development, manufacture, regulation and worldwide commercialization of human gastrointestinal health products.

For these reasons, we cannot be certain that we and Mytesi can compete effectively.

Our animal health products face significant competition from other pharmaceutical companies and our operating results will suffer if we fail to compete effectively.

The development and commercialization of animal health products is highly competitive and our success depends on our ability to compete effectively with other products in the market. We expect to compete with the animal health divisions of major pharmaceutical and biotechnology companies such as Merck Animal Health, Elanco Animal Health, Bayer Animal Health GmbH, Novartis Animal Health Inc. and Boehringer Ingelheim Animal Health, as well as specialty animal health medicines companies such as Zoetis Inc., Phibro Animal Health Corporation and, in Europe,

43

Table of Contents

Virbac S.A., Vétoquinol S.A., Ceva Animal Health S.A. and Dechra Pharmaceuticals PLC. We are also aware of several early stage companies that are developing products for use in the animal health market, including Aratana Therapeutics, Inc., Kindred Biosciences, Inc., Parnell Pharmaceuticals Holdings Ltd. and ImmuCell Corporation. We also compete with academic institutions, governmental agencies and private organizations that are conducting research in the field of animal health products.

Although there are currently no FDA approved anti secretory products to treat chemotherapy induced diarrhea (CID) in dogs, we anticipate that Canalevia, if approved, may face competition from various products, including products approved for use in humans that are used extra label in animals. Extra label use is the use of an approved drug outside of its cleared or approved indications in the animal context. All of our potential products could also face competition from new products in development. These and other potential competing products may benefit from greater brand recognition and brand loyalty than our products and product candidates may achieve.

Many of our competitors and potential competitors have substantially more financial, technical and human resources than we do. Many also have more experience in the development, manufacture, regulation and worldwide commercialization of animal health products, including animal prescription drugs and non prescription products.

For these reasons, we cannot be certain that we and our products can compete effectively.

We may be unable to obtain, or obtain on a timely basis, regulatory approval for our existing or future human or animal prescription drug product candidates under applicable regulatory requirements, which would harm our operating results.

The research, testing, manufacturing, labeling, approval, sale, marketing and distribution of human and animal health products are subject to extensive regulation. We are typically not permitted to market our prescription drug product candidates in the United States until we receive approval of the product from the FDA through the filing of an NDA or NADA, as applicable. To gain approval to market a prescription drug, we must provide the FDA with safety and efficacy data from pivotal trials that adequately demonstrate that our prescription drug product candidates are safe and effective for the intended indications. Likewise, to gain approval to market an animal prescription drug for a particular species, we must provide the FDA with safety and efficacy data from pivotal trials that adequately demonstrate that our prescription drug product candidates are safe and effective in the target species (e.g. dogs, cats or horses) for the intended indications. In addition, we must provide manufacturing data evidencing that we can produce our product candidates in accordance with cGMP. For the FDA, we must also provide data from toxicology studies, also called target animal safety studies, and in some cases environmental impact data. In addition to our internal activities, we will partially rely on contract research organizations (“CROs”), and other third parties to conduct our toxicology studies and for certain other product development activities. The results of toxicology studies, other initial development activities, and/or any previous studies in humans or animals conducted by us or third parties may not be predictive of future results of pivotal trials or other future studies, and failure can occur at any time during the conduct of pivotal trials and other development activities by us or our CROs. Our pivotal trials may fail to show the desired safety or efficacy of our prescription drug product candidates despite promising initial data or the results in previous human or animal studies conducted by others. Success of a prescription drug product candidate in prior animal studies, or in the treatment of humans, does not ensure success in subsequent studies. Clinical trials in humans and pivotal trials in animals sometimes fail to show a benefit even for drugs that are effective because of statistical limitations in the design of the trials or other statistical anomalies. Therefore, even if our studies and other development activities are completed as planned, the results may not be sufficient to obtain a required regulatory approval for a product candidate.

Regulatory authorities can delay, limit or deny approval of any of our prescription drug product candidates for many reasons, including:

- if they disagree with our interpretation of data from our pivotal studies or other development efforts;
- if we are unable to demonstrate to their satisfaction that our product candidate is safe and effective for the target indication and, if applicable, in the target species;

Table of Contents

- if they require additional studies or change their approval policies or regulations;
- if they do not approve of the formulation, labeling or the specifications of our current and future product candidates; and
- if they fail to approve the manufacturing processes of our third party contract manufacturers.

Further, even if we receive a required approval, such approval may be for a more limited indication than we originally requested, and the regulatory authority may not approve the labeling that we believe is necessary or desirable for successful commercialization.

Any delay or failure in obtaining any necessary regulatory approval for the intended indications of our human or animal product candidates would delay or prevent commercialization of such product candidates and would harm our business and our operating results.

The results of our earlier studies of Mytesi may not be predictive of the results in any future clinical trials and species specific formulation studies, respectively, and we may not be successful in our efforts to develop or commercialize line extensions of Mytesi.

Our human and animal product pipeline includes a number of potential indications of Mytesi, our lead prescription product. The results of our studies and other development activities and of any previous studies in humans or animals conducted by us or third parties may not be predictive of future results of these clinical studies and formulation studies, respectively. Failure can occur at any time during the conduct of these trials and other development activities. Even if our formulation/clinical studies and other development activities are completed as planned, the results may not be sufficient to pursue a particular line extension for Mytesi. Further, even if we obtain promising results from our clinical trials or species specific formulation studies, as applicable, we may not successfully commercialize any line extension. Because line extensions are developed for a particular market, we may not be able to leverage our experience from the commercial launch of Mytesi in new markets. If we are not successful in developing and successfully commercializing these line extension products, we may not be able to grow our revenue and our business may be harmed.

Development of prescription drug products is inherently expensive, time consuming and uncertain, and any delay or discontinuance of our current or future pivotal trials would harm our business and prospects.

Development of prescription drug products for human and animal gastrointestinal health remains an inherently lengthy, expensive and uncertain process, and our development activities may not be successful. We do not know whether our current or planned pivotal trials for any of our product candidates will begin or conclude on time, and they may be delayed or discontinued for a variety of reasons, including if we are unable to:

- address any safety concerns that arise during the course of the studies;
- complete the studies due to deviations from the study protocols or the occurrence of adverse events;
- add new study sites;
- address any conflicts with new or existing laws or regulations; or
- reach agreement on acceptable terms with study sites, which can be subject to extensive negotiation and may vary significantly among different sites.

Further, we may not be successful in developing new indications for Mytesi, and Neonorm may be subject to the same regulatory regime as prescription drug products in jurisdictions outside the United States. Any delays in completing our development efforts will increase our costs, delay our development efforts and approval process and

Table of Contents

jeopardize our ability to commence product sales and generate revenue. Any of these occurrences may harm our business, financial condition and prospects. In addition, factors that may cause a delay in the commencement or completion of our development efforts may also ultimately lead to the denial of regulatory approval of our product candidates which, as described above, would harm our business and prospects.

We will partially rely on third parties to conduct our development activities. If these third parties do not successfully carry out their contractual duties, we may be unable to obtain regulatory approvals or commercialize our current or future human or animal product candidates on a timely basis, or at all.

We will partially rely upon CROs to conduct our toxicology studies and for other development activities. We intend to rely on CROs to conduct one or more of our planned pivotal trials. These CROs are not our employees, and except for contractual duties and obligations, we have limited ability to control the amount or timing of resources that they devote to our programs or manage the risks associated with their activities on our behalf. We are responsible for ensuring that each of our studies is conducted in accordance with the development plans and trial protocols presented to regulatory authorities. Any deviations by our CROs may adversely affect our ability to obtain regulatory approvals, subject us to penalties or harm our credibility with regulators. The FDA and foreign regulatory authorities also require us and our CROs to comply with regulations and standards, commonly referred to as good clinical practices (GCPs), or good laboratory practices (“GLPs”), for conducting, monitoring, recording and reporting the results of our studies to ensure that the data and results are scientifically valid and accurate.

Agreements with CROs generally allow the CROs to terminate in certain circumstances with little or no advance notice. These agreements generally will require our CROs to reasonably cooperate with us at our expense for an orderly winding down of the CROs’ services under the agreements. If the CROs conducting our studies do not comply with their contractual duties or obligations, or if they experience work stoppages, do not meet expected deadlines, or if the quality or accuracy of the data they obtain is compromised, we may need to secure new arrangements with alternative CROs, which could be difficult and costly. In such event, our studies also may need to be extended, delayed or terminated as a result, or may need to be repeated. If any of the foregoing were to occur, regulatory approval, if required, and commercialization of our product candidates may be delayed and we may be required to expend substantial additional resources.

Even if we obtain regulatory approval for planned follow on indications of Mytesi, or for Canalevia or our other product candidates, they may never achieve market acceptance. Further, even if we are successful in the ongoing commercialization of Mytesi, we may not achieve commercial success.

If we obtain necessary regulatory approvals for planned follow on indications of Mytesi or for Canalevia or our other product candidates, such products may still not achieve market acceptance and may not be commercially successful. Market acceptance of Mytesi, Canalevia, and any of our other products depends on a number of factors, including:

- the safety of our products as demonstrated in our target animal studies;
- the indications for which our products are approved or marketed;
- the potential and perceived advantages over alternative treatments or products, including generic medicines and competing products currently prescribed by physicians or veterinarians, as applicable, and, in the case of animal products, products approved for use in humans that are used extra label in animals;
- the acceptance by physicians, veterinarians, companion animal owners, as applicable, of our products as safe and effective;
- the cost in relation to alternative treatments and willingness on the part of physicians, veterinarians, patients and animal owners, as applicable, to pay for our products;

Table of Contents

- the prevalence and severity of any adverse side effects of our products;
- the relative convenience and ease of administration of our products; and
- the effectiveness of our sales, marketing and distribution efforts.

Any failure by Mytesi, Canalevia, Equilevia or any of our other products to achieve market acceptance or commercial success would harm our financial condition and results of operations.

Human and animal gastrointestinal health products are subject to unanticipated post approval safety or efficacy concerns, which may harm our business and reputation.

The success of our commercialization efforts will depend upon the perceived safety and effectiveness of human and animal gastrointestinal health products, in general, and of our products, in particular. Unanticipated safety or efficacy concerns can subsequently arise with respect to approved prescription drug products, such as Mytesi, or non prescription products, such as Neonorm, which may result in product recalls or withdrawals or suspension of sales, as well as product liability and other claims. Any safety or efficacy concerns, or recalls, withdrawals or suspensions of sales of our products could harm our reputation and business, regardless of whether such concerns or actions are justified.

Future federal and state legislation may result in increased exposure to product liability claims, which could result in substantial losses.

Under current federal and state laws, companion and production animals are generally considered to be the personal property of their owners and, as such, the owners' recovery for product liability claims involving their companion and production animals may be limited to the replacement value of the animal. Companion animal owners and their advocates, however, have filed lawsuits from time to time seeking non economic damages such as pain and suffering and emotional distress for harm to their companion animals based on theories applicable to personal injuries to humans. If new legislation is passed to allow recovery for such non economic damages, or if precedents are set allowing for such recovery, we could be exposed to increased product liability claims that could result in substantial losses to us if successful. In addition, some horses can be worth millions of dollars or more, and product liability for horses may be very high. While we currently have product liability insurance, such insurance may not be sufficient to cover any future product liability claims against us.

If we fail to retain current members of our senior management, or to identify, attract, integrate and retain additional key personnel, our business will be harmed.

Our success depends on our continued ability to attract, retain and motivate highly qualified management and scientific personnel. We are highly dependent upon our senior management, particularly Lisa A. Conte, our president and Chief Executive Officer. The loss of services of any of our key personnel would cause a disruption in our ability to develop our current or future product pipeline and commercialize our products and product candidates. Although we have offer letters with these key members of senior management, such agreements do not prohibit them from resigning at any time. For example, the resignation of our former Chief Financial Officer, Charles O. Thompson, in September 2014, and the mutually agreed departure of our former Chief Veterinary Officer, Serge Martinod, D.V.M., Ph.D. in February 2015, caused us to incur additional expenses and expend resources to ensure a smooth transition with their respective successors, which diverted management attention away from executing our operational plan during this period. We currently do not maintain "key man" life insurance on any of our senior management team. The loss of Ms. Conte or other members of our current senior management could adversely affect the timing or outcomes of our current and planned studies, as well as the prospects for commercializing our products.

In addition, competition for qualified personnel in the human and animal gastrointestinal health fields is intense, because there are a limited number of individuals who are trained or experienced in the field. We will need to hire

additional personnel as we expand our product development and commercialization activities. Even if we are

Table of Contents

successful in hiring qualified individuals, as we are a growing organization, we do not have a track record for integrating and retaining individuals. If we are not successful in identifying, attracting, integrating or retaining qualified personnel on acceptable terms, or at all, our business will be harmed.

We are dependent on two suppliers for the raw material used to produce the active pharmaceutical ingredient in Mytesi and Canalevia and the botanical extract in Neonorm and Equilevia. The termination of either of these contracts would result in a disruption to product development and our business will be harmed.

The raw material used to manufacture Mytesi, Canalevia, Neonorm and Equilevia is crude plant latex (CPL), derived from the Croton lechleri tree, which is found in countries in South America, principally Peru. The ability of our contract suppliers to harvest CPL is governed by the terms of their respective agreements with local government authorities. Although CPL is available from multiple suppliers, we only have contracts with two suppliers to obtain CPL and arrange the shipment to our contract manufacturer. Accordingly, if our contract suppliers do not or are unable to comply with the terms of our respective agreements, and we are not able to negotiate new agreements with alternate suppliers on terms that we deem commercially reasonable, it may harm our business and prospects. The countries from which we obtain CPL could change their laws and regulations regarding the export of the natural products or impose or increase taxes or duties payable by exporters of such products. Restrictions could be imposed on the harvesting of the natural products or additional requirements could be implemented for the replanting and regeneration of the raw material. Such events could have a significant impact on our cost and ability to produce Mytesi, Canalevia, Neonorm, Equilevia and anticipated line extensions.

We are dependent upon third party contract manufacturers, both for the supply of the active pharmaceutical ingredient in Mytesi and Canalevia and the botanical extract in Neonorm and Equilevia, as well as for the supply of finished products for commercialization.

We have contracted with third parties for the formulation of API and botanical extract into finished products for our studies. We have also entered into memorandums of understanding with Indena S.p.A. for the manufacture of CPL received from our suppliers into the API in Canalevia to support our regulatory filings, as well as the botanical extract in Neonorm and agreed to negotiate a commercial supply agreement. Indena S.p.A. has never manufactured either such ingredient to commercial scale. AGlenmark is the current manufacturer of crofelemer, the active API in Canalevia, for Mytesi, and the manufacturer on file for the NADA to which we have a right of reference. As announced in October of 2015, we have entered an agreement with Patheon, a provider of drug development and delivery solutions, under which Patheon provides enteric coated tablets to us for use in animals. We also may contract with additional third parties for the formulation and supply of finished products, which we will use in our planned studies and commercialization efforts.

We will be dependent upon our contract manufacturers for the supply of the API in Mytesi and Canalevia. We currently have sufficient quantities of the API used in Mytesi to support our projected sales efforts for 2019. However, we will require additional quantities of API to ensure our ongoing sales efforts for 2010 and beyond. If our contract manufacturer cannot manufacture sufficient quantities of the API in a timely manner we could suffer losses due to lost sales opportunities. We currently have sufficient quantities of the botanical extract used in Neonorm and Equilevia to support planned commercialization efforts for Neonorm and Equilevia. However, we will require additional quantities of the botanical extract if our ongoing commercialization efforts for Neonorm or our ongoing commercial launch of Equilevia is successful. If we are not successful in reaching agreements with third parties on terms that we consider commercially reasonable for manufacturing and formulation, or if our contract manufacturer and formulator are not able to produce sufficient quantities or quality of API, botanical extract or finished product under their agreements, it could delay our plans and harm our business prospects.

The facilities used by our third party contractors are subject to inspections, including by the FDA, and other regulators, as applicable. We also depend on our third party contractors to comply with cGMP. If our third party contractors do not maintain compliance with these strict regulatory requirements, we and they will not be able to secure or maintain regulatory approval for their facilities, which would have an adverse effect on our operations. In addition, in some cases, we also are dependent on our third party contractors to produce supplies in conformity to our specifications and maintain quality control and quality assurance practices and not to employ disqualified personnel. If

Table of Contents

the FDA or a comparable foreign regulatory authority does not approve the facilities of our third party contractors if so required, or if it withdraws any such approval in the future, we may need to find alternative manufacturing or formulation facilities, which could result in delays in our ability to develop or commercialize our human and animal products, if at all. We and our third party contractors also may be subject to penalties and sanctions from the FDA and other regulatory authorities for any violations of applicable regulatory requirements. The USDA and the European Medicines Agency (the "EMA"), employ different regulatory standards than the FDA, so we may require multiple manufacturing processes and facilities for the same human or animal product candidate or any approved product. We are also exposed to risk if our third party contractors do not comply with the negotiated terms of our agreements, or if they suffer damage or destruction to their facilities or equipment.

If we are unable to establish sales capabilities on our own or through third parties, we may not be able to market and sell our current or future human or animal products and product candidates, if approved, and generate product or other revenue.

We currently have limited sales, marketing or distribution capabilities, and prior to Napo's launch of Mytesi for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy, and our launch of Neonorm for preweaned dairy calves, we had no experience in the sale, marketing and distribution of human or animal health products. There are significant risks involved in building and managing a sales organization, including our potential inability to attract, hire, retain and motivate qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel and effectively oversee a geographically dispersed sales and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities and entry into adequate arrangements with distributors or other partners would adversely impact the commercialization of Mytesi, Neonorm, Equilevia and, if approved, Canalevia. If we are not successful in commercializing Mytesi, Equilevia, Canalevia or any of our other line extension products, either on our own or through one or more distributors, or in generating upfront licensing or other fees, we may never generate significant revenue and may continue to incur significant losses, which would harm our financial condition and results of operations.

Changes in distribution channels for animal health prescription drugs may make it more difficult or expensive to distribute our animal health prescription drug products.

In the United States, animal owners typically purchase their animal health prescription drugs from their local veterinarians who also prescribe such drugs. There is a trend, however, toward increased purchases of animal health prescription drugs from Internet based retailers, "big box" retail stores and other over the counter distribution channels, which follows an emerging shift in recent years away from the traditional veterinarian distribution channel. It is also possible that animal owners may come to rely increasingly on Internet based animal health information rather than on their veterinarians. We currently expect to market our animal health prescription drugs directly to veterinarians, so any reduced reliance on veterinarians by animal owners could harm our business and prospects by making it more difficult or expensive for us to distribute our animal health prescription drug products.

Legislation has been or may be proposed in various states that would require veterinarians to provide animal owners with written prescriptions and disclosures that the animal owner has the right to fill the prescriptions through other means. If enacted, such legislation could lead to a reduction in the number of animal owners who purchase their animal health pharmaceuticals directly from veterinarians, which also could harm our business.

Consolidation of our customers could negatively affect the pricing of our animal health products.

Veterinarians will be our primary customers for our prescription animal health drug products, as well as, to some extent, our non prescription animal health products, such as Neonorm and Equilevia. In recent years, there has been a

trend towards the consolidation of veterinary clinics and animal hospitals. If this trend continues, these large clinics and hospitals could attempt to leverage their buying power to obtain favorable pricing from us and other animal health product companies. Any downward pressure on the prices of any of our animal health products could harm our operating results and financial condition.

Table of Contents

We will need to increase the size of our organization and may not successfully manage such growth.

As of December 31, 2018, we had 40 employees. Our ability to manage our growth effectively will require us to hire, train, retain, manage and motivate additional employees and to implement and improve our operational, financial and management systems. These demands also may require the hiring of additional senior management personnel or the development of additional expertise by our senior management personnel. If we fail to expand and enhance our operational, financial and management systems in conjunction with our potential future growth, it could harm our business and operating results.

Research and development with respect to our animal health products and product candidates relies on evaluations in animals, which is controversial and may become subject to bans or additional regulations.

The evaluation of our animal health products and product candidates in target animals is required to develop, formulate and commercialize our animal health products and product candidates. Although our animal testing will be subject to GLPs and GCPs, as applicable, animal testing in the human pharmaceutical industry and in other industries continues to be the subject of controversy and adverse publicity. Some organizations and individuals have sought to ban animal testing or encourage the adoption of additional regulations applicable to animal testing. To the extent that such bans or regulations are imposed, our research and development activities with respect to animal health products, and by extension our operating results and financial condition, could be harmed. In addition, negative publicity about animal practices by us or in our industry could harm our reputation among potential customers.

If approved, our animal health prescription drug product candidates may be marketed in the United States only in the target animals and for the indications for which they are approved, and if we want to expand the approved animals or indications, it will need to obtain additional approvals, which may not be granted.

If our animal health prescription drug product candidates are approved by regulatory authorities, we may market or advertise them only in the specific species and for treatment of the specific indications for which they were approved, which could limit use of the products by veterinarians and animal owners. We intend to develop, promote and commercialize approved products for new animal treatment indications in the future, but we cannot be certain whether or at what additional time and expense we will be able to do so. If we do not obtain marketing approvals for new indications, our ability to expand our animal health business may be harmed.

Under the Animal Medicinal Drug Use Clarification Act of 1994, veterinarians are permitted to prescribe extra label uses of certain approved animal drugs and approved human drugs for animals under certain conditions. While veterinarians may in the future prescribe and use human approved products or use our products for extra label uses, we may not promote our animal health products for extra label uses. We note that extra label uses are uses for which the product has not received approval. If the FDA determines that any of our marketing activities constitute promotion of an extra label use, we could be subject to regulatory enforcement, including seizure of any misbranded or mislabeled drugs, and civil or criminal penalties, any of which could have an adverse impact on our reputation and expose us to potential liability. We will continue to spend resources ensuring that our promotional claims for our animal health products and product candidates remain compliant with applicable FDA laws and regulations, including materials we post or link to on our website. For example, in 2012, our Chief Executive Officer received an “untitled letter” from the FDA while at Napo regarding preapproval promotion statements constituting misbranding of crofelemer, which was then an investigational drug. These statements were included in archived press releases included on Napo’s website. Napo was required to expend time and resources to revise its website to remove the links in order to address the concerns raised in the FDA’s letter.

If our human or animal prescription drug product candidates are approved by regulatory authorities, the misuse or extra label use of such products may harm our reputation or result in financial or other damages.

If our human or animal prescription drug product candidates are approved by regulatory authorities, there may be increased risk of product liability if physicians, veterinarians, patients, animal owners or others, as applicable, attempt to use such products extra label, including the use of our products for indications or in species for which they have not

Table of Contents

been approved. Furthermore, the use of an approved human or animal drug for indications other than those indications for which such products have been approved may not be effective, which could harm our reputation and lead to an increased risk of litigation. If we are deemed by a governmental or regulatory agency to have engaged in the promotion of any approved human or animal product for extra label use, such agency could request that we modify our training or promotional materials and practices and we could be subject to significant fines and penalties, and the imposition of these sanctions could also affect our reputation and position within the gastrointestinal health industry. Any of these events could harm our reputation and our operating results.

We may not maintain the benefits associated with MUMS designation, including market exclusivity.

Although we have received MUMS designation for Canalevia for the treatment of CID in dogs, we may not maintain the benefits associated with MUMS designation. MUMS designation is a status similar to “orphan drug” status for human drugs. When we were granted MUMS designation for Canalevia for the indication of CID in dogs, we became eligible for incentives to support the approval or conditional approval of the designated use. This designation does not allow us to commercialize a product until such time as we obtain approval or conditional approval of the product.

Because Canalevia has received MUMS designation for the identified particular intended use, we are eligible to obtain seven years of exclusive marketing rights upon approval (or conditional approval) of Canalevia for that intended use and become eligible for grants to defray the cost of our clinical work. Each designation that is granted must be unique, i.e., only one designation can be granted for a particular API in a particular dosage form for a particular intended use. The intended use includes both the target species and the disease or condition to be treated.

At some point, we could lose MUMS designation. The basis for a lost designation can include but is not limited to, our failure to engage with due diligence in moving forward with a non conditional approval, or a competing product has received conditional approval or approval prior to our product candidate for the same indication or species. In addition, MUMS designation may be withdrawn for a variety of reasons such as where the FDA determines that the request for designation was materially defective, or if the manufacturer is unable to assure sufficient quantity of the prescription drug product to meet the needs of animals with the rare disease or condition. If this designation is lost, it could have a negative impact on the product and us, which includes but is not limited to, market exclusivity related to MUMS designation, or eligibility for grants as a result of MUMS designation.

The market for our human or animal products, and the gastrointestinal health market as a whole, is uncertain and may be smaller than we anticipate, which could lead to lower revenue and harm our operating results.

It is very difficult to estimate the commercial potential of any of our human or animal products because the gastrointestinal health market continues to evolve and it is difficult to predict the market potential for our products. The market will depend on important factors such as safety and efficacy compared to other available treatments, changing standards of care, preferences of physicians and veterinarians, as applicable, the willingness of patients and companion and production animal owners, as applicable, to pay for such products, and the availability of competitive alternatives that may emerge either during the product development process or after commercial introduction. If the market potential for our human or animal products is less than we anticipate due to one or more of these factors, it could negatively impact our business, financial condition and results of operations. Further, the willingness of patients and companion and production animal owners to pay for our products may be less than we anticipate, and may be negatively affected by overall economic conditions. Moreover, with respect to our animal health products, the current penetration of animal insurance in the United States is low, animal owners are likely to have to pay out of pocket, and such owners may not be willing or able to pay for our products.

Insurance coverage for Mytesi for its current approved indication could decrease or end, or Mytesi might not receive insurance coverage for any approved follow on indications, which could lead to lower revenue and harm our operating

results.

For its current approved indication, Mytesi is currently covered by all of the top 10 commercial insurance plans, representing more than 245 million U.S. lives. In 50% of these plans it is currently on Tier 3 with no restrictions,

Table of Contents

and in 50% it is currently on Tier 3 with a prior authorization required. In the top 10 Managed Medicare plans, which represent 24 million covered lives, Mytesi is currently covered on 10% of plans. Mytesi is currently covered on Medicaid in all 50 states. However, the nature or extent of coverage for Mytesi by any of these plans or programs could change or be terminated, or Mytesi might not receive insurance coverage for any approved follow on indications. Either outcome could lead to significantly lower revenue and significantly harm our operating results.

We may engage in future acquisitions that increase our capital requirements, dilute our stockholders, cause us to incur debt or assume contingent liabilities and subject us to other risks.

We may evaluate various strategic transactions, including licensing or acquiring complementary products, technologies or businesses. Any potential acquisitions may entail numerous risks, including increased operating expenses and cash requirements, assimilation of operations and products, retention of key employees, diversion of our management's attention and uncertainties in our ability to maintain key business relationships of the acquired entities. In addition, if we undertake acquisitions, 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. Moreover, we may not be able to locate suitable acquisition opportunities and this inability could impair our ability to grow or obtain access to technology or products that may be important to the development of our business.

Certain of the countries in which we plan to commercialize our products in the future are developing countries, some of which have potentially unstable political and economic climates.

We may commercialize our products in jurisdictions that are developing and emerging countries. This may expose us to the impact of political or economic upheaval, and we could be subject to unforeseen administrative or fiscal burdens. At present, we are not insured against the political and economic risks of operating in these countries. Any significant changes to the political or economic climate in any of the developing countries in which we operate or plan to sell products either now or in the future may have a substantial adverse effect on our business, financial condition, trading performance and prospects.

Fluctuations in the exchange rate of foreign currencies could result in currency transactions losses.

As we expand our operations, we expect to be exposed to risks associated with foreign currency exchange rates. We anticipate that we may commercialize Canalevia and its line extensions in jurisdictions outside the United States. As a result, we may also be further affected by fluctuations in exchange rates in the future to the extent that sales are denominated in currencies other than U.S. dollars. We do not currently employ any hedging or other strategies to minimize this risk, although we may seek to do so in the future.

There are other gastrointestinal focused human pharmaceutical companies, and we face competition in the marketplaces in which we operate or plan to operate.

Our commercial success in the human drug arena remains dependent on maintaining or establishing a competitive position in the market for the current, approved specialty indication of Mytesi as well as for planned Mytesi follow on indications. In the IBS D market in particular, several competitors have commercially available products approved for our planned IBS D indication. The availability of our competitors' products could limit the demand, and the price we are able to charge, for any drug candidate we develop. The inability to compete with existing or subsequently introduced drug candidates would have a material adverse impact on our business, financial condition and prospects.

Our obligations to CVP are secured by a security interest in substantially all of our veterinary related assets, so if we default on those obligations, CVP could foreclose on our assets.

Our obligations under the secured promissory notes (the "CVP Notes") issued to Chicago Venture Partners, L.P. ("CVP") are secuired by a security interest in substantially all of our veterinary related assets, including intellectual property, as provided in the Security Agreement, dated June 29, 2017, between us and CVP, the Security

Table of Contents

Agreement, dated December 8, 2017, between us and CVP, the Security Agreement dated February 26, 2018 between the Company and CVP, and the Security Agreement dated March 21, 2018 between the Company and CVP. As a result, if we default on our obligations under these agreements, CVP could foreclose on its security interests and liquidate some or all of these assets, which would harm our veterinary related business, financial condition and results of operations and could require us to reduce or cease operations.

Napo's obligations to the holders of the Kingdon Notes are secured by a security interest in substantially all of Napo's assets, so if we default on those obligations, the convertible note holders could foreclose on Napo's assets.

Napo's obligations under the convertible promissory notes (the "Kingdon Notes") issued pursuant to the Amended and Restated Note Purchase Agreement, dated March 31, 2017, in the aggregate principal amount of approximately $10 million, by and among Kingdon Associates, M. Kingdon Offshore Master Fund L.P., Kingdon Family Partnership, L.P. and Kingdon Credit Master Fund L.P. (collectively, the "Kingdon Purchasers") and Napo and the related transaction documents are secured by a security interest in substantially all of Napo's assets, including Napo intellectual property. As a result, if we default under our obligations under the Kingdon Notes or the transaction documents, the holders of such Kingdon Notes, acting through their appointed agent, could foreclose on their security interests and liquidate some or all of these assets, which would harm our business, financial condition and results of operations and could require us to reduce or cease operations.

Failure in our information technology systems, including by cyber attacks or other data security incidents, could significantly disrupt our operations.

Our operations depend, in part, on the continued performance of our information technology systems. Our information technology systems are potentially vulnerable to physical or electronic break ins, computer viruses, phishing attacks and other types of disruptions. We have and continue to experience cyber attacks of varying degrees. Our security measures may also be breached due to employee error, malfeasance, system errors or other vulnerabilities. Such breach or unauthorized access or attempts by outside parties to fraudulently induce employees or users to disclose sensitive information in order to gain access to our data could result in significant legal and financial exposure, and damage to our reputation that could potentially have an adverse effect on our business. Because the techniques used to obtain unauthorized access, or sabotage systems change frequently, become more sophisticated, and often are not recognized until launched against a target, we may be unable to anticipate these techniques or to implement adequate preventative measures. Additionally, cyber attacks could also compromise trade secrets and other sensitive information and result in such information being disclosed to others and becoming less valuable, which could negatively affect our business. Although we have information technology security systems, a successful cybersecurity attack or other data security incident could result in the misappropriation and/or loss of confidential or personal information, create system interruptions, deploy malicious software that attacks our systems, or result in financial losses. It is possible that a cybersecurity attack might not be noticed for some period of time. The occurrence of a cybersecurityattack or incident could result in business interruptions from the disruption of our information technology systems, or negative publicity resulting in reputational damage with our shareholders and other stakeholders and/or increased costs to prevent, respond to or mitigate cybersecurity events. In addition, the unauthorized dissemination of sensitive personal information or proprietary or confidential information could expose us or other third parties to regulatory fines or penalties, litigation and potential liability, or otherwise harm our business.

Risks Related to Intellectual Property

We cannot be certain that our patent strategy will be effective to protect against competition

Our commercial success depends in large part on obtaining and maintaining patent, trademark and trade secret protection of our human or animal products, both prescription and non prescription, our current human or animal product candidates and any future human or animal product candidates, and their respective components, formulations, methods used to manufacture them and methods of treatment, as well as successfully defending our patents and other intellectual property rights against third party challenges. Our ability to stop unauthorized third parties from making, using, selling, offering to sell or importing our products or our product candidates is dependent upon the extent to which we have rights under valid and enforceable patents, trade secrets and other similar intellectual property that cover these

Table of Contents

activities. The patent prosecution process is expensive and time consuming, and we may not be able to prepare, file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of inventions made in the course of development and commercialization activities in time to obtain patent protection on them.

We have a portfolio of United States and foreign issued patents and pending applications related to our products and product candidates. We have five issued United States patents listed in the FDA's Orange Book for Mytesi. We plan to rely on certain of these issued patents as protection for Canalevia. The strength of patents in the field of pharmaceuticals and animal health involves complex legal and scientific questions and can be uncertain. We cannot be certain that pending applications will issue as patents. For those patents that are already issued and even if other patents do successfully issue, third parties may challenge their validity, enforceability or scope, which may result in such patents being narrowed, invalidated or held unenforceable. Furthermore, even if they are unchallenged, our patents may not adequately protect our intellectual property or prevent others from designing around their claims. If the patents we have are not maintained or their scope is significantly narrowed or if we are not able to obtain issued patents from pending applications, our business and prospects would be harmed.

Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of any patent applications and the enforcement or defense of any patents that issue. On September 16, 2011, the Leahy Smith America Invents Act, or the Leahy Smith Act, was signed into law. The Leahy Smith Act includes a number of significant changes to U.S. patent law. These include provisions that affect the way patent applications are prosecuted, redefine prior art, may affect patent litigation, and switch the U.S. patent system from a "first to invent" system to a "first to file" system. Under a "first to file" system, assuming the other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to the patent on an invention regardless of whether another inventor had made the invention earlier. The USPTO has developed new regulations and procedures to govern administration of the Leahy Smith Act, and many of the substantive changes to patent law associated with the Leahy Smith Act, and in particular, the first to file provisions, became effective on March 16, 2013. Among some of the other changes to the patent laws are changes that limit where a patentee may file a patent infringement suit and that provide opportunities for third parties to challenge any issued patent in the USPTO. The Leahy Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our patents and any other patents that issue, all of which could harm our business and financial condition.

Obtaining and maintaining our 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.

Periodic maintenance and annuity fees on any issued patent and, in certain jurisdictions, pending applications, are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent. 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 process. While an inadvertent 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 noncompliance 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 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 prescription drug products, prescription drug product candidates and non prescription products, our competitors might be able to enter the market, which would harm our business.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, which would be costly, time consuming and, if successfully asserted against us, delay or prevent the development and commercialization of our current or future products and product candidates.

Our research, development and commercialization activities may infringe or otherwise violate or be claimed to infringe or otherwise violate patents owned or controlled by other parties. There may be patents already issued of

Table of Contents

which we are unaware that might be infringed by a product or one of our current or future prescription drug product candidates or non prescription products. Moreover, it is also possible that patents may exist that we are aware of, but that we do not believe are relevant to our current or future prescription drug product candidates or non prescription products, which could nevertheless be found to block our freedom to market these products. Because patent applications can take many years to issue and may be confidential for 18 months or more after filing, there may be applications now pending of which we are unaware and which may later result in issued patents that may be infringed by our current or future prescription drug product candidates or non prescription products. We cannot be certain that our products, current or future prescription drug product candidates or non prescription products will not infringe these or other existing or future third party patents. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents.

To the extent we become subject to future third party claims against us or our collaborators, we could incur substantial expenses and, if any such claims are successful, we could be liable to pay substantial damages, including treble damages and attorney's fees if we or our collaborators are found to be willfully infringing a third party's patents. If a patent infringement suit were brought against us or our collaborators, we or they could be forced to stop or delay research, development, manufacturing or sales of the human or animal prescription drug or non prescription product that is the subject of the suit. Even if we are successful in defending such claims, infringement and other intellectual property claims can be expensive and time consuming to litigate and divert management's attention from our business and operations. As a result of or in order to avoid potential patent infringement claims, we or our collaborators may be compelled to seek a license from a third party for which we would be required to pay license fees or royalties, or both. Moreover, these licenses may not be available on acceptable terms, or at all. Even if we or our collaborators were able to obtain such a license, the rights may be nonexclusive, which could allow our competitors access to the same intellectual property. Any of these events could harm our business and prospects.

Our proprietary position depends upon patents that are formulation or method of use patents, which do not prevent a competitor from using the same human or animal drug for another use.

Composition of matter patents on the API in prescription drug products are generally considered to be the strongest form of intellectual property protection because such patents provide protection without regard to any particular method of use or manufacture or formulation of the API used. The composition of matter patents for crofelemer, the API in Mytesi and Canalevia, have expired, and the issued patents and applications relevant to our products and product candidates cover formulations and methods of use for crofelemer and the botanical extract in Neonorm and Equilevia.

Method of use patents protect the use of a product for the specified method and formulation patents cover formulations of the API or botanical extract. These types of patents do not prevent a competitor from developing or marketing an 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 do not actively promote their product for our targeted indications or uses for which we may obtain patents, physicians may recommend that patients use our products extra label, and veterinarians may recommend that animal owners use these products extra label, or animal owners may do so themselves. Although extra label use may infringe or contribute to the infringement of method of use patents, the practice is common and such infringement is difficult to prevent or prosecute.

We may be involved in lawsuits to protect or enforce our patents, which could be expensive, time consuming and unsuccessful, and third parties may challenge the validity or enforceability of our patents and they may be successful.

We intend to rely upon a combination of regulatory exclusivity periods, patents, trade secret protection, and confidentiality agreements to protect the intellectual property related to Mytesi, our current prescription drug product

candidates, non prescription products and our development programs.

If the breadth or strength of protection provided by any patents, patent applications or future patents we may own, license, or pursue with respect to any of our current or future product candidates or products is threatened, it could threaten our ability to commercialize any of our current or future human or animal product candidates or products.

Table of Contents

Further, if we encounter delays in our development efforts, the period of time during which we could market any of our current or future product candidates or products under any patent protection we obtain would be reduced.

Given the amount of time required for the development, testing and regulatory review of new product candidates or products, patents protecting such candidates might expire before or shortly after such product candidates or products are commercialized. The United States Patent and Trademark Office has issued a patent term extension certificate extending the term of US 7,341,744 by 1075 days under 35 USC 156. With respect to requests for patent term extensions, the applicable authorities, including the USPTO and the FDA, and any equivalent regulatory authority in other countries, may not agree with our assessment of whether such extensions are available, and may refuse to grant extensions to patents, or may grant more limited extensions than requested. If this occurs, our competitors may take advantage of our investment in development and trials by referencing our clinical and preclinical data and launch their product earlier than might otherwise be the case.

Even where laws provide protection or we are able to obtain patents, costly and time consuming litigation may be necessary to enforce and determine the scope of our proprietary rights, and the outcome of such litigation would be uncertain. Moreover, any actions we may bring to enforce our intellectual property against our competitors could provoke them to bring counterclaims against us, and some of our competitors have substantially greater intellectual property portfolios than we have. To counter infringement or unauthorized use of any patents we may obtain, we may be required to file infringement claims, which can be expensive and time consuming to litigate. In addition, if we or one of our future collaborators were to initiate legal proceedings against a third party to enforce a patent covering one of our products, current product candidates, or one of our future products, the defendant could counterclaim that the patent is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace and challenges to validity of patents in certain foreign jurisdictions is common as well. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, non enablement or lack of statutory subject matter. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant material information from the USPTO, or made a materially misleading statement, during prosecution. In particular, Mytesi had regulatory exclusivity as a new chemical entity until December 31, 2017. Under the Hatch Waxman Act, a competitor seeking to market a generic form of Mytesi before the expiration of any of the patents listed in the FDA's Orange Book for Mytesi could file (and could have filed after December 31, 2016) an ANDA with a certification under 21 U.S.C. § 3559j)(2)(A)(iv) that each of these patents (except for those which the ANDA filer states it will market only after its expiration) is either invalid, unenforceable or not infringed. We may assert the patents in Hatch Waxman litigation against the party filing the ANDA to keep the competing product off of the market until the patents expire but there is a risk that we will not succeed. The party filing the ANDA may also counterclaim in the litigation that our patents are not valid or unenforceable, and the court may find one or more claims of our patents invalid or unenforceable. If this occurs, a competing generic product could be marketed prior to expiration of our patents listed in the Orange Book, which would harm our business.

Third parties may also raise similar validity claims before the USPTO in post grant proceedings such as ex parte reexaminations, inter partes review, or post grant review, or oppositions or similar proceedings outside the United States, in parallel with litigation or even outside the context of litigation. The outcome following legal assertions of invalidity and unenforceability is unpredictable. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of any future patent protection on one or more of our products or our current or future product candidates. Such a loss of patent protection could harm our business. We cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution or other basis for a finding of invalidity. Litigation proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. 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. If securities analysts or investors perceive these results to be unsuccessful, it could have an adverse effect on the price of our common stock. Finally, we may not be able to prevent, misappropriation of our trade secrets or confidential information, particularly in countries where the laws may not protect those rights as fully as in the United States.

Table of Contents

If we are unable to prevent disclosure of our trade secrets or other confidential information to third parties, our competitive position may be impaired.

We also rely on trade secret protection and confidentiality agreements to protect proprietary know how that is not patentable or for which we have not filed patent applications, processes for which patents are difficult to enforce and other elements of our product development processes that involve proprietary know how, information or technology that is not covered by patents. Although we require all of our employees to assign their inventions to us, and endeavor to execute confidentiality agreements with all of our employees, consultants, advisors and any third parties who have access to our proprietary know how, information or technology, we cannot be certain that we have executed such agreements with all parties who may have helped to develop our intellectual property or had access to our proprietary information, or that our agreements will not be breached. We cannot guarantee that our trade secrets and other confidential proprietary information will not be disclosed or that competitors will not otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. If we are unable to prevent disclosure of our intellectual property to third parties, we may not be able to maintain a competitive advantage in our market, which would harm our business.

Any disclosure to or misappropriation by third parties of our confidential proprietary information could enable competitors to quickly duplicate or surpass our technological achievements, and erode our competitive position in our market.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing our ability to protect our products.

As is the case with other human or animal pharmaceutical product companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the human and animal health industries involves both technological and legal complexity. Therefore, obtaining and enforcing patents is costly, time consuming and inherently uncertain. In addition, the United States has recently enacted and implemented wide ranging patent reform legislation. 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. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce patents that we have licensed or that we might obtain in the future.

We may not be able to protect our intellectual property rights throughout the world, which could impair our business.

Filing, prosecuting and defending patents on human and animal drug products, product candidates and non prescription products throughout the world would be prohibitively expensive. 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 may obtain patent protection, but where patent enforcement is not as strong as that in the United States. These products may compete with our products in jurisdictions where we do not have any issued or licensed patents and any future patent claims or other intellectual property rights may not be effective or sufficient to prevent them from so competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to animal health products, which could make it difficult for us to stop the infringement of our future patents, if any, or patents we have in

licensed, or marketing of competing products in violation of our proprietary rights generally. Further, the laws of some foreign countries do not protect proprietary rights to the same extent or in the same manner as the laws of the United States. As a result, we may encounter significant problems in protecting and defending our intellectual property both in the United States and abroad. Proceedings to enforce our future patent rights, if any, in foreign jurisdictions could result in substantial cost and divert our efforts and attention from other aspects of our business.

Table of Contents

Our business could be harmed if we fail to obtain certain registered trademarks in the United States or in other countries.

Our registered and pending U.S. trademarks include NEONORM®, MYTESI®, NAPO®, Napo Logo®, CANALEVIA, EQUILEVIA, JAGUAR ANIMAL HEALTH, the Jaguar Animal Health logo and MY HIV THANK YOU. We also own pending applications for the CANALEVIA mark in a number of foreign countries. We have not yet filed applications for our company name or our logo in the U.S. During trademark registration proceedings, we may receive rejections of our trademark applications. If so, we will have an opportunity to respond, but we may be unable to overcome such rejections. In addition, the USPTO and comparable agencies in many foreign jurisdictions may permit third parties to oppose pending trademark applications and to seek to cancel registered trademarks. If opposition or cancellation proceedings are filed against any of our trademark applications or any registered trademarks, our trademarks may not survive such proceedings. Moreover, any name we propose to use with our prescription drug product candidates in the United States, including CANALEVIA, must be approved by the FDA, regardless of whether we have registered or applied to register as a trademark. The FDA typically conducts a review of proposed prescription drug product names, including an evaluation of potential for confusion with other product names. If the FDA objects to any of our proposed proprietary product names, we may be required to expend significant additional resources in an effort to identify a suitable substitute name that would qualify under applicable trademark laws, not infringe the existing rights of third parties and be acceptable to the FDA.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of third parties.

We have received confidential and proprietary information from third parties. In addition, we employ individuals who were previously employed at other biotechnology, pharmaceutical or animal health companies. We may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise improperly used or disclosed confidential information of these third parties or our employees' former employers. Litigation may be necessary to defend against any such claims. Even if we were successful in defending against any such claims, such litigation could result in substantial cost and be a distraction to our management and employees.

Risks Related to Government Regulation

Even if we receive any of the required regulatory approvals for our current or future prescription drug product candidates and non prescription products, we will be subject to ongoing obligations and continued regulatory review, which may result in significant additional expense.

If the FDA or any other regulatory body approves any of our current or future prescription drug product candidates, or if necessary, our non prescription products, the manufacturing processes, clinical development, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion and recordkeeping for the product may be subject to extensive and ongoing regulatory requirements. These requirements could include, but are not limited to, submissions of efficacy and safety and other post marketing information and reports, establishment registration, and product listing, compliance with new rules promulgated under the FSMA, as well as continued compliance with cGMP, GLP and GCP for any studies that we conduct post approval. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with our contract manufacturers or manufacturing processes, or failure to comply with regulatory requirements, are reportable events to the FDA and may result in, among other things:

- restrictions on the marketing or manufacturing of the product, withdrawal of the product from the market, revised labeling, or voluntary or involuntary product recalls;
- additional clinical studies, fines, warning letters or holds on target animal studies;

58

Table of Contents

- refusal by the FDA, or other regulators to approve pending applications or supplements to approved applications filed by us or our strategic collaborators related to the unknown problems, or suspension or revocation of the problematic product's license approvals;
- product seizure or detention, or refusal to permit the import or export of products; and
- injunctions and/or the imposition of civil or criminal penalties.

The FDA or other regulatory agency's policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates or require certain changes to the labeling or additional clinical work concerning safety and efficacy of the product candidates. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability, which would harm our business. In addition, failure to comply with these regulatory requirements could result in significant penalties.

In addition, from time to time, we may enter into consulting and other financial arrangements with veterinarians, who prescribe or recommend our products, once approved. As a result, we may be subject to state, federal and foreign healthcare and/or veterinary medicine laws. If our financial relationships with veterinarians are found to be in violation of such laws that apply to us, we may be subject to penalties.

The issuance by the FDA of protocol concurrences for our pivotal studies does not guarantee ultimate approval of our NADA.

We intend to seek protocol concurrences from the FDA for the pivotal trial of Canalevia that we have initiated for acute diarrhea in dogs and for future pivotal trials in other indications. A pivotal study protocol is submitted to the FDA by a drug sponsor for purposes of obtaining FDA review of the protocol. Prior FDA review of the protocol for a pivotal study makes it more likely that the study design will generate information the sponsor needs to demonstrate to the satisfaction of the FDA whether the drug is safe and effective for its intended use. It creates an expectation by the sponsor that the FDA should not later alter its perspectives on these issues unless public or animal health concerns appear that were not recognized at the time of protocol assessment. Even if the FDA issues a protocol concurrence, ultimate approval of an NADA by the FDA is not guaranteed because a final determination that the agreed upon protocol satisfies a specific objective, such as the demonstration of efficacy, or supports an approval decision, will be based on a complete review of all the data submitted to the FDA including the outcome of the study for which protocol concurrence was received. Even if we were to obtain protocol concurrence such concurrence does not guarantee that the results of the study will support a particular finding or approval of the new drug.

Any of our current or future prescription drug product candidates or non prescription products may cause or contribute to adverse medical events that we would be required to report to regulatory authorities and, if we fail to do so, we could be subject to sanctions that would harm our business.

If we are successful in commercializing any of our current or future prescription drug product candidates or non prescription products, certain regulatory authorities will require that we report certain information about adverse medical events if those products may have caused or contributed to those adverse events. The timing of our obligation to report would be triggered by the date we become aware of the adverse event as well as the nature of the event. We may fail to report adverse events we become aware of within the prescribed timeframe. We may also fail to appreciate that we have become aware of a reportable adverse event, especially if such event is not reported to us as an adverse event or if it is an adverse event that is unexpected or removed in time from the use of our products. If we fail to comply with our reporting obligations, the regulatory authorities could take action including, but not limited to, criminal prosecution, seizure of our products, facility inspections, removal of our products from the market, recalls of

certain lots or batches, or cause a delay in approval or clearance of future products.

Table of Contents

Legislative or regulatory reforms with respect to animal health may make it more difficult and costly for us to obtain regulatory clearance or approval of any of our current or future product candidates and to produce, market, and distribute our products after clearance or approval is obtained.

From time to time, legislation is drafted and introduced in the U.S. Congress or other jurisdictions in which we intend to operate that could significantly change the statutory provisions governing the testing, regulatory clearance or approval, manufacture, and marketing of regulated products. In addition, the FDA's regulations and guidance are often revised or reinterpreted by the FDA and such other regulators in ways that may significantly affect our business and our products and product candidates. Similar changes in laws or regulations can occur in other countries. Any new regulations or revisions or reinterpretations of existing regulations in the United States or in other countries may impose additional costs or lengthen review times of any of our current or future products and product candidates. We cannot determine what effect changes in regulations, statutes, legal interpretation or policies, when and if promulgated, enacted or adopted may have on our business in the future. Such changes could, among other things, require:

- changes to manufacturing methods;
- additional clinical trials or testing;
- new requirements related to approval to enter the market;
- recall, replacement, or discontinuance of certain products; and
- additional record keeping or the development of certain regulatory required hazard identification plans.

Each of these would likely entail substantial time and cost and could harm our financial results. In addition, delays in receipt of or failure to receive regulatory clearances or approvals for any future products would harm our business, financial condition, and results of operations.

We believe that our non prescription products are not subject to regulation by regulatory agencies in the United States, but there is a risk that regulatory bodies may disagree with our interpretation, or may redefine the scope of their regulatory reach in the future, which would result in additional expense and could delay or prevent the commercialization of these products.

The FDA retains jurisdiction over all animal prescription drug products however, in many instances, the Federal Trade Commission will exercise primary or concurrent jurisdiction with FDA on non prescription products as to post marketing claims made regarding the product. On April 22, 1996, the FDA published a statement in the Federal Register, 61 FR 17706, that it believes that the Dietary Supplement and Health Education Act ("DSHEA"), does not apply to animal health supplement products, such as our non prescription products. Accordingly, the FDA's Center for Veterinary Medicine only regulates those animal supplements that fall within the FDA's definition of an animal drug, animal food or animal feed additive. The Federal Food Drug and Cosmetic Act defines food as "articles used for food or drink for man or other animals and articles used as components of any such article." Animal foods are not subject to pre market approval and are designed to provide a nutritive purpose to the animals that receive them. Feed additives are defined as those articles that are added to an animal's feed or water as illustrated by the guidance documents. Our non prescription products are not added to food, are not ingredients in food nor are they added to any animal's drinking water. Therefore, our non prescription products do not fall within the definition of a food or feed additive. In light of the pronouncement by the FDA that the DSHEA was not intended to apply to animals, the FDA seeks to regulate such supplements as food or food additives depending on the intended use of the product. The intended use is demonstrated by how the article is included in a food, or added to the animals' intake (i.e., through its drinking water). If the intended use of the product does not fall within the proscribed use making the product a food, it cannot be regulated as a food. There is no intent to make our non prescription products a component of an animal food, either directly or indirectly. A feed additive is a product that is added to a feed for any reason including the top dressing of an already prepared feed. Some additives, such as certain forage, are deemed to be Generally Recognized as Safe, or GRAS, and therefore, not subject to a feed Additive Petition approval prior to use. However, the substances deemed GRAS are generally those

60

Table of Contents

that are recognized as providing nutrients as a food does. We do not believe that our non prescription products fit within this framework either. Finally, a new animal drug refers to drugs intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in animals. Our non prescription Neonorm Foal and Neonorm Calf products are not intended to diagnose, cure, mitigate, treat or prevent disease and therefore, do not fit within the definition of an animal drug. Additionally, because a previously marketed human formulation of the botanical extract in our non prescription products was regulated as a human dietary supplement subject to the DSHEA (and not regulated as a drug by the FDA), we do not believe that the FDA would regulate the animal formulation used in our non prescription products in a different manner. We do not believe that our non prescription products fit the definition of an animal drug, food or food additive and therefore are not regulated by the FDA at this time.

However, despite many such unregulated animal supplements currently on the market, the FDA may choose in the future to exercise jurisdiction over animal supplement products in which case, we may be subject to unknown regulations thereby inhibiting our ability to launch or to continue marketing our non prescription products. In the past, the FDA has redefined or attempted to redefine some non prescription non feed products as falling within the definition of drug, feed or feed additive and therefore subjected those products to the relevant regulations. We have not discussed with the FDA its belief that the FDA currently does not exercise jurisdiction over our non prescription products. Should the FDA assert regulatory authority over our non prescription products, we would take commercially reasonable steps to address the FDA's concerns, potentially including but not limited to, seeking registration for such products, reformulating such products to further distance such products from regulatory control, or ceasing sale of such products. Further, the Animal and Plant Health Inspection Service, an agency of the USDA, may at some point choose to exercise jurisdiction over certain non prescription products that are not intended for production animals. We do not believe we are currently subject to such regulation, but could be in the future. If the FDA or other regulatory agencies, such as the USDA, try to regulate our non prescription products, we could be required to seek regulatory approval for our non prescription products, which would result in additional expense and could delay or prevent the commercialization of these products.

Even if Napo receives the required regulatory approvals for Napo's current or future prescription drug product candidates and non prescription products, Napo will be subject to ongoing obligations and continued regulatory review, which may result in significant additional expense.

If the FDA or any other regulatory body approves any of Napo's current or future prescription drug product candidates, or if necessary, Napo's non prescription products, the manufacturing processes, clinical development, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion and recordkeeping for the product is subject to extensive and ongoing regulatory requirements. These requirements could include, but are not limited to, submissions of efficacy and safety and other post marketing information and reports, establishment registration, and product listing, compliance with new rules promulgated under the FSMA, as well as continued compliance with cGMP, GLP and GCP for any studies that Napo conducts post approval. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with Napo's contract manufacturers or manufacturing processes, or failure to comply with regulatory requirements, are reportable events to the FDA and may result in, among other things:

- restrictions on the marketing or manufacturing of the product, withdrawal of the product from the market, revised labeling, or voluntary or involuntary product recalls;
- additional clinical studies fines, warning letters or holds on studies;
- refusal by the FDA, or other regulators to approve pending applications or supplements to approved applications filed by Napo or Napo's strategic collaborators related to the unknown problems, or suspension or revocation of the problematic product's license approvals;
- product seizure or detention, or refusal to permit the import or export of products; and

· injunctions or the imposition of civil or criminal penalties.

Table of Contents

The FDA or other regulatory agency's policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of Napo's product candidates or require certain changes to the labeling or require additional clinical work concerning safety and efficacy of the product candidates. Napo cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. If Napo is slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if Napo is not able to maintain regulatory compliance, Napo may lose any marketing approval that Napo may have obtained and Napo may not achieve or sustain profitability, which would harm Napo's business. In addition, failure to comply with these regulatory requirements could result in significant penalties.

In addition, from time to time, Napo may enter into consulting and other financial arrangements with physicians, who prescribe or recommend Napo's products, once approved. As a result, Napo may be subject to state, federal and foreign healthcare laws, including but not limited to anti kickback laws. If Napo's financial relationships with physicians are found to be in violation of such laws that apply to Napo, Napo may be subject to penalties.

The issuance by the FDA of protocol concurrences for Napo's pivotal studies does not guarantee ultimate approval of Napo's NDA.

Napo intends to seek protocol concurrences from the FDA for future pivotal trials that Napo initiates. A pivotal study protocol is submitted to the FDA by a drug sponsor for purposes of obtaining FDA review of the protocol. Prior FDA review of the protocol for a pivotal study makes it more likely that the study will generate information the sponsor needs to demonstrate whether the drug is safe and effective for its intended use. It creates an expectation by the sponsor that the FDA should not later alter its perspectives on these issues unless public concerns appear that were not recognized at the time of protocol assessment. Even if the FDA issues a protocol concurrence, ultimate approval of an NDA by the FDA is not guaranteed because a final determination that the agreed upon protocol satisfies a specific objective, such as the demonstration of efficacy, or supports an approval decision, will be based on a complete review of all the data submitted to the FDA. Even if Napo were to obtain protocol concurrence such concurrence does not guarantee that the results of the study will support a particular finding or approval of the new drug.

Any of Napo's current or future prescription drug product candidates or non prescription products may cause or contribute to adverse medical events that Napo would be required to report to regulatory authorities and, if Napo fails to do so, Napo could be subject to sanctions that would harm Napo's business.

If Napo is successful in commercializing any of Napo's current or future prescription drug product candidates or non prescription products, certain regulatory authorities will require that Napo report certain information about adverse medical events if those products may have caused or contributed to those adverse events. The timing of Napo's obligation to report would be triggered by the date Napo becomes aware of the adverse event as well as the nature of the event. Napo may fail to report adverse events Napo becomes aware of within the prescribed timeframe. Napo may also fail to appreciate that Napo has become aware of a reportable adverse event, especially if it is not reported to Napo as an adverse event or if it is an adverse event that is unexpected or removed in time from the use of Napo's products. If Napo fails to comply with Napo's reporting obligations, the regulatory authorities could take action including, but not limited to, criminal prosecution, seizure of Napo's products, facility inspections, removal of Napo's products from the market, recalls of certain lots or batches, or cause a delay in approval or clearance of future products.

Legislative or regulatory reforms make it more difficult and costly for Napo to obtain regulatory clearance or approval of any of Napo's current or future product candidates and to produce, market, and distribute Napo's products after clearance or approval is obtained.

From time to time, legislation is drafted and introduced in the U.S. Congress or other jurisdictions in which Napo intends to operate that could significantly change the statutory provisions governing the testing, regulatory clearance or approval, manufacture, and marketing of regulated products. In addition, the FDA's regulations and guidance are often revised or reinterpreted by the FDA and such other regulators in ways that may significantly affect Napo's business and Napo's products and product candidates. Similar changes in laws or regulations can occur in other countries. Any new regulations or revisions or reinterpretations of existing regulations in the United States or in other

Table of Contents

countries may impose additional costs or lengthen review times of any of Napo's current or future products and product candidates. Napo cannot determine what effect changes in regulations, statutes, legal interpretation or policies, when and if promulgated, enacted or adopted may have on Napo's business in the future. Such changes could, among other things, require:

- changes to manufacturing methods;
- additional clinical trials or testing;
- new requirements related to approval to enter the market;
- recall, replacement, or discontinuance of certain products; and
- additional record keeping or the development of certain regulatory required hazard identification plans.

Each of these would likely entail substantial time and cost and could harm Napo's financial results. In addition, delays in receipt of or failure to receive regulatory clearances or approvals for any future products would harm Napo's business, financial condition, and results of operations.

Risks Related to Our Common Stock

Our failure to meet the continued listing requirements of The NASDAQ Capital Market could result in a delisting of our common stock.

Our common stock is listed on The Nasdaq Capital Market, which imposes, among other requirements a minimum bid requirement. The closing bid price for our common stock must remain at or above $1.00 per share to comply with Nasdaq's minimum bid requirement for continued listing. If the closing bid price for our common stock is less than $1.00 per share for 30 consecutive business days, Nasdaq may send us a notice stating that we will be provided a period of 180 days to regain compliance with the minimum bid requirement or else Nasdaq may make a determination to delist our common stock. Our common stock traded for less than $1.00 for 30 consecutive trading days, and we received notice of this from the Listing Qualifications Staff of The Nasdaq Stock Market LLC on November 9, 2018. Under Nasdaq Listing Rule 5810(c)(3)(A), the Company has been granted a 180 calendar day grace period, or until May 8, 2019, to regain compliance with the minimum bid price requirement. The minimum bid price requirement will be met if our common stock has a minimum closing bid price of at least $1.00 per share for a minimum of 10 consecutive business days during the 180 calendar day grace period. We are diligently working to evidence compliance with the minimum bid requirement for continued listing on Nasdaq; however, there can be no assurance that we will be able to regain compliance or that Nasdaq will grant us a further extension of time to regain compliance, if necessary.

The Company may be eligible for additional time to comply if it does not achieve compliance with the Minimum Bid Price Requirement by May 8, 2019. In order to be eligible for such additional time, the Company will be required to meet the continued listing requirement for market value of publicly held shares and all other initial listing standards for The NASDAQ Capital Market, with the exception of the Minimum Bid Price Requirement, and must notify NASDAQ in writing of its intention to cure the deficiency during the second compliance period.

The delisting of our common stock from Nasdaq may make it more difficult for us to raise capital on favorable terms in the future. Such a delisting would likely have a negative effect on the price of our common stock and would impair your ability to sell or purchase our common stock when you wish to do so. Further, if we were to be delisted from The Nasdaq Capital Market, our common stock would cease to be recognized as covered securities and we would be subject to regulation in each state in which it offers its securities. Moreover, there is no assurance that any actions that we take to restore our compliance with the Nasdaq minimum bid requirement would stabilize the market price or improve the liquidity of our common stock, prevent our common stock from falling below the Nasdaq minimum bid price required for continued listing again or prevent future non compliance with Nasdaq's listing requirements.

63

Table of Contents

We have a material weakness in our internal control over financial reporting related to staff turnover in our accounting department. We did not maintain a sufficient complement of internal personnel with appropriate knowledge, experience and/or training commensurate with our financial reporting requirements. If we fail to remediate the material weakness, or experience any additional material weaknesses in the future or otherwise fail to maintain an effective system of internal controls in the future, we may not be able to accurately report our financial condition or results of operations which may adversely affect investor confidence in us and, as a result, the value of our common stock.

Our management is responsible for establishing and maintaining adequate internal control over our financial reporting, as defined in Rule 13a 15(f) under the Securities Exchange Act of 1934, as amended (the "Exchange Act").

Preparing our consolidated financial statements involves a number of complex manual and automated processes, which are dependent upon individual data input or review and require significant management judgment. One or more of these elements may result in errors that may not be detected and could result in a material misstatement of our consolidated financial statements. If we fail to maintain the adequacy of our internal controls over financial reporting, our business and operating results may be harmed and we may fail to meet our financial reporting obligations. If material weaknesses in our internal control are discovered or occur, our consolidated financial statements may contain material misstatements and we could be required to restate our financial results.

In connection with our preparation of our annual financial statements for the year ended December 31, 2018, we identified a material weakness in our internal control over financial reporting related to staff turnover in our accounting department. We did not maintain a sufficient complement of internal personnel with appropriate knowledge, experience and/or training commensurate with our financial reporting requirements. We relied on outside consulting technical experts and did not maintain adequate internal qualified personnel to properly supervise and review the information provided by the outside consulting technical experts to ensure certain significant complex transactions and technical matters were properly accounted for, specifically with respect to accurately reflecting all potential accrued services on the balance sheet at December 31, 2018. In addition, we identified inadequate internal technical staffing levels and expertise to properly supervise and review the information of the outside consulting technical experts to properly apply ASC 815-40 for liability classification of certain warrants and ASC 470-50 and ASC 470-60 to properly reflect the accounting impact to multiple modifications of the Company's debt instruments. We have concluded that we must implement new or improved controls in our financial statement close process and policies in reviewing information received from our outside consulting technical experts.

We have enhanced our internal controls, processes and related documentation necessary to remediate our material weakness. We may not be able to complete our remediation, evaluation and testing in a timely fashion. If we are unable to remediate this material weakness, or if we identify one or more other material weaknesses in our internal control over financial reporting, we will continue to be unable to conclude that our internal controls are effective. If we are unable to confirm that our internal control over financial reporting is effective we could lose investor confidence in the accuracy and completeness of our financial reports, which could cause the price of our common stock to decline.

If our shares become subject to the penny stock rules, it would become more difficult to trade our shares.

The SEC has adopted rules that regulate broker dealer practices in connection with transactions in penny stocks. Penny stocks are generally equity securities with a price of less than $5.00, other than securities registered on certain national securities exchanges or authorized for quotation on certain automated quotation systems, provided that current price and volume information with respect to transactions in such securities is provided by the exchange or system. If we do not retain a listing on The NASDAQ Capital Market and if the price of our common stock is less than $5.00, our common stock will be deemed a penny stock. The penny stock rules require a broker dealer, before a transaction in a

penny stock not otherwise exempt from those rules, to deliver a standardized risk disclosure document containing specified information. In addition, the penny stock rules require that before effecting any transaction in a penny stock not otherwise exempt from those rules, a broker dealer must make a special written determination that the penny stock is a suitable investment for the purchaser and receive (i) the purchaser's written acknowledgment of the receipt of a risk disclosure statement; (ii) a written agreement to transactions involving penny stocks and (iii) a signed and dated copy of a written suitability statement. These disclosure requirements may have the effect of reducing the

Table of Contents

trading activity in the secondary market for our common stock, and therefore stockholders may have difficulty selling their shares.

The price of our common stock could be subject to volatility related or unrelated to our operations, and purchasers of our common stock could incur substantial losses.

The trading price of our common stock could be subject to wide fluctuations in response to various factors, some of which are beyond our control. These factors include those discussed previously in this "Risk Factors" section of this report and others, such as:

- delays in the commercialization of Mytesi, Neonorm, Canalevia, Equilevia or our other current or future prescription drug product candidates and non prescription products;
- any delays in, or suspension or failure of, our current and future studies;
- announcements of regulatory approval or disapproval of any of our current or future product candidates or of regulatory actions affecting our company or our industry;
- manufacturing and supply issues that affect product candidate or product supply for our studies or commercialization efforts;
- quarterly variations in our results of operations or those of our competitors;
- changes in our earnings estimates or recommendations by securities analysts;
- the payment of licensing fees or royalties in shares of our common stock;
- announcements by us or our competitors of new prescription drug products or product candidates or non prescription products, significant contracts, commercial relationships, acquisitions or capital commitments;
- announcements relating to future development or license agreements including termination of such agreements;
- adverse developments with respect to our intellectual property rights or those of our principal collaborators;
- commencement of litigation involving us or our competitors;
- any major changes in our board of directors or management;
- new legislation in the United States relating to the prescription, sale, distribution or pricing of gastrointestinal health products;
- product liability claims, other litigation or public concern about the safety of our prescription drug product or product candidates and non prescription products or any such future products;
- market conditions in the human or animal industry, in general, or in the gastrointestinal health sector, in particular, including performance of our competitors; and
- general economic conditions in the United States and abroad.

Table of Contents

In addition, the stock market, in general, or the market for stocks in our industry, in particular, may experience broad market fluctuations, which may adversely affect the market price or liquidity of our common stock. Any sudden decline in the market price of our common stock could trigger securities class action lawsuits against us. If any of our stockholders were to bring such a lawsuit against us, we could incur substantial costs defending the lawsuit and the time and attention of our management would be diverted from our business and operations. We also could be subject to damages claims if we were found to be at fault in connection with a decline in our stock price.

No active market for our common stock exists or may develop, and you may not be able to resell our common stock when you wish to sell them or at a price that you consider attractive or satisfactory.

Prior to our initial public offering in May 2015, there was no public market for shares of our common stock. The listing of our common stock on The NASDAQ Capital Market does not assure that a meaningful, consistent and liquid trading market exists. Although our common stock is listed on The NASDAQ Capital Market, trading volume in our common stock has been limited and an active trading market for our shares may never develop or be sustained. If an active market for our common stock does not develop, you may be unable to sell your shares when you wish to sell them or at a price that you consider attractive or satisfactory. The lack of an active market may also adversely affect our ability to raise capital by selling securities in the future, or impair our ability to license or acquire other product candidates, businesses or technologies using our shares as consideration.

The sale of our common stock to Oasis Capital may cause substantial dilution to our existing stockholders and the sale of the shares of common stock acquired by OasisCapital could cause the price of our common stock to decline.

On April 1, 2019, we entered into a common stock purchase agreement with Oasis Capital, LLC (“Oasis Capital”) relating to an offering of an aggregate of up to 20,000,000 shares of our common stock which are being offered in a primary offering consisting of an equity line of credit (the “Oasis CSPA”). We have the option to increase the equity line of credit by an additional 20,000,000 shares of Common Stock by notifying Oasis Capital at any time after the effective date of the Oasis CSPA.

We may ultimately sell all, some or none of the common stock under the Oasis CSPA, and Oasis Capital may sell all, some or none of our shares that it holds or comes to hold under the Oasis CSPA. Sales by Oasis Capital of shares acquired pursuant to the Oasis CSPA may result in dilution to the interests of other holders of our common stock. The sale of a substantial number of shares of our common stock by Oasis Capital, or anticipation of such sales, could make it more difficult for us to sell equity or equity related securities in the future at a time and at a price that we might otherwise wish to effect sales. However, we have the right to control the timing and amount of sales of our shares to Oasis Capital, and the Oasis CSPA may be terminated by us at any time at our discretion without any penalty or cost to us.

If securities or industry analysts do not publish research or reports about our company, or if they issue adverse or misleading opinions regarding us or our stock, our stock price and trading volume could decline.

The trading market for our common stock depends in part on the research and reports that industry or financial analysts publish about us or our business. We do not influence or control the reporting of these analysts. If one or more of the analysts who do cover us downgrade or provide a negative outlook on our company or our industry, or the stock of any of our competitors, the price of our common stock could decline. If one or more of these analysts ceases coverage of our company, we could lose visibility in the market, which in turn could cause the price of our common stock to decline.

You may be diluted by conversions of outstanding non voting common stock, Series A Preferred Stock and convertible notes and exercises of outstanding options and warrants.

As of December 31, 2018, we had (i) outstanding options to purchase an aggregate of 2,944,148 shares of our common stock at a weighted average exercise price of $5.81 per share, (ii) warrants to purchase an aggregate of 2,427,653 shares of our common stock at a weighted average exercise price of $2.51 per share and (iii) outstanding

Table of Contents

convertible promissory notes in an aggregate principal amount of $10,553,888, which are convertible for up to 759,396 shares of our common stock. As of March 31, 2019, we had 33,149,556 shares of common stock issuable upon conversion of outstanding shares of Series A convertible participating preferred stock ("Series A Preferred Stock"), with a conversion price of $0.2775 per share.

The exercise of such options and warrants or conversion of the convertible promissory notes and Series A Preferred Stock will result in further dilution of your investment. In addition, you may experience additional dilution if we issue common stock in the future. As a result of this dilution, you may receive significantly less in net tangible book value than the full purchase price you paid for the shares in the event of liquidation.

If shares of our non voting common stock are converted into shares of our voting common stock, your voting power will be diluted.

As of December 31, 2018, we had 24,603,104 shares of voting common stock and 40,301,237 shares of non voting common stock outstanding. Generally, holders of our non voting common stock have no voting power (other than in connection with a change of control of our company) and have no right to participate in any meeting of stockholders or to have notice thereof. However, shares of our non voting common stock that are converted into voting common stock will have all the voting rights of the voting common stock. Shares of our non voting common stock are convertible into shares of our voting common stock on a fifteen for one basis (i) at the option of the respective holders thereof, at any time and from time to time on or after April 1, 2018 or (ii) automatically, without any payment of additional consideration by the holder thereof, (x) upon a transfer of such shares to any person or entity that is neither an affiliate of Nantucket nor an investment fund, investment vehicle or other account, that is, directly or indirectly, managed or advised by Nantucket or any of its affiliates pursuant to a sale of such stock to a third party for cash in accordance with the terms and condition set forth in the Investor Rights Agreement, or (y) upon the subsequent release or transfer of such shares to the registered pre Merger legacy stockholders of Napo's outstanding shares of common stock as of July 31, 2017 (the "Napo Legacy Stockholders"). Upon conversion of any non voting common stock, your voting power will be diluted in proportion to the decrease in your ownership of the total outstanding voting common stock.

Provisions in our charter documents and under Delaware law could discourage a takeover that stockholders may consider favorable and may lead to entrenchment of management.

Our third amended and restated certificate of incorporation and amended and restated bylaws contain provisions that could delay or prevent changes in control or changes in our management without the consent of our board of directors. These provisions to include the following:

- a classified board of directors with three year staggered terms, which may delay the ability of stockholders to change the membership of a majority of our board of directors;
- no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- the exclusive right of our board of directors to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our board of directors;
- the ability of our board of directors to authorize the issuance of shares of preferred stock and to determine the terms of those shares, including preferences and voting rights, without stockholder approval, which could adversely affect the rights of our common stockholders or be used to deter a possible acquisition of our company;
- the ability of our board of directors to alter our bylaws without obtaining stockholder approval;

Table of Contents

- the required approval of the holders of at least 75% of the shares entitled to vote at an election of directors to adopt, amend or repeal our bylaws or repeal the provisions of our third amended and restated certificate of incorporation regarding the election and removal of directors;
- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- the requirement that a special meeting of stockholders may be called only by the chairman of the board of directors, the chief executive officer, the president or the board of directors, which may delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors; and
- advance notice procedures that stockholders must comply with in order to nominate candidates to our board of directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of us.

These provisions could inhibit or prevent possible transactions that some stockholders may consider attractive.

We are also subject to the anti takeover provisions contained in Section 203 of the Delaware General Corporation Law. Under Section 203, a corporation generally may not engage in a business combination with any holder of 15% or more of its capital stock unless the holder has held the stock for three years or, among other exceptions, the board of directors has approved the transaction.

Our amended and restated bylaws designate the Court of Chancery of the State of Delaware as the sole and exclusive forum for certain actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or other employees.

Our amended and restated bylaws provide that, unless we consent in writing to an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee to us or our stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, (iv) any action asserting a claim that is governed by the internal affairs doctrine or (v) any action to interpret, apply, enforce or determine the validity of our certificate of incorporation or bylaws. Any person purchasing or otherwise acquiring any interest in any shares of our capital stock shall be deemed to have notice of and to have consented to this provision of our amended and restated bylaws. This choice of forum provision may limit our stockholders' ability to bring a claim in a judicial forum that they find favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits. Alternatively, if a court were to find this provision of our amended and restated bylaws inapplicable or unenforceable with respect to one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could harm our business and financial condition.

We do not intend to pay dividends on our common stock, and your ability to achieve a return on your investment will depend on appreciation in the market price of our common stock.

We currently intend to invest our future earnings, if any, to fund our growth and not to pay any cash dividends on our common stock. Moreover, so long as either (i) Nantucket or any of its affiliates owns any shares of our non voting common stock or (ii) Sagard Capital Partners, L.P. ("Sagard") or any of its affiliates owns 35% or more of the shares of our Series A Preferred Stock, we cannot pay dividends on our common stock or non voting common stock without obtaining the prior written consent of Nantucket or Sagard, respectively. Because we do not intend to pay dividends and may be required to obtain written consent if we were to do so, your ability to receive a return on your investment will

68

Table of Contents

depend on any future appreciation in the market price of our common stock. We cannot be certain that our common stock will appreciate in price.

Our principal stockholders own a significant percentage of our voting stock and will be able to exert significant control over matters subject to stockholder approval.

As of December 31, 2018, our executive officers, directors, holders of 5% or more of our capital stock and their respective affiliates beneficially owned in the aggregate approximately 44% of the outstanding shares of our voting common stock. As a result of their stock ownership, these stockholders may have the ability to influence our management and policies, and will be able to significantly affect the outcome of matters requiring stockholder approval such as elections of directors, amendments of our organizational documents or approvals of any merger, sale of assets or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may feel are in your best interest as one of our stockholders.

The requirements of being a public company, including compliance with the reporting requirements of the Exchange Act and the requirements of the Sarbanes Oxley Act, may strain our resources, increase our costs and distract management, and we may be unable to comply with these requirements in a timely or cost effective manner.

Our initial public offering had a significant, transformative effect on us. Prior to our initial public offering, our business operated as a privately held company, and we were not required to comply with public reporting, corporate governance and financial accounting practices and policies required of a publicly traded company. As a publicly traded company, we incur significant additional legal, accounting and other expenses compared to historical levels. In addition, new and changing laws, regulations and standards relating to corporate governance and public disclosure, including the Dodd Frank Wall Street Reform and Consumer Protection Act and the rules and regulations thereunder, as well as under the Sarbanes Oxley Act, the JOBS Act and the rules and regulations of the SEC and The NASDAQ Capital Market, may result in an increase in our costs and the time that our board of directors and management must devote to our compliance with these rules and regulations. These rules and regulations have substantially increased our legal and financial compliance costs and diverted management time and attention from our product development and other business activities.

The Sarbanes Oxley Act requires, among other things, that we assess the effectiveness of its internal control over financial reporting annually and the effectiveness of our disclosure controls and procedures quarterly. In particular, Section 404 of the Sarbanes Oxley Act, or Section 404, requires us to perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on, and our independent registered public accounting firm potentially to attest to, the effectiveness of our internal control over financial reporting. We have needed to expend time and resources on documenting our internal control over financial reporting so that we are in a position to perform such evaluation when required. As an “emerging growth company,” we expect to avail ourselves of the exemption from the requirement that our independent registered public accounting firm attest to the effectiveness of our internal control over financial reporting under Section 404. However, we may no longer avail itself of this exemption when we cease to be an “emerging growth company.” When our independent registered public accounting firm is required to undertake an assessment of our internal control over financial reporting, the cost of our compliance with Section 404 will correspondingly increase. Our compliance with applicable provisions of Section 404 requires that we incur substantial accounting expense and expend significant management time on compliance related issues as we implement additional corporate governance practices and comply with reporting requirements. Moreover, if we are not able to comply with the requirements of Section 404 applicable to us in a timely manner, or if we or our independent registered public accounting firm identifies deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, the market price of our stock could decline and we could be subject to sanctions or investigations by the SEC or other regulatory authorities, which would require additional financial and management resources.

69

Table of Contents

We are an “emerging growth company” and we cannot be certain if the reduced disclosure requirements applicable to “emerging growth companies” will make our common stock less attractive to investors.

We are an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and we may take advantage of certain exemptions and relief from various reporting requirements that are applicable to other public companies that are not “emerging growth companies.” In particular, while we are an “emerging growth company” (i) we will not be required to comply with the auditor attestation requirements of Section 404(b) of the Sarbanes Oxley Act, (ii) we will be subject to reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and (iii) we will not be required to hold nonbinding advisory votes on executive compensation or stockholder approval of any golden parachute payments not previously approved. In addition, the JOBS Act provides that an emerging growth company can delay its adoption of any new or revised accounting standards, but we have irrevocably elected not to avail ourselves of this exemption and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies. In addition, investors may find our common stock less attractive if we rely on the exemptions and relief granted by the JOBS Act. 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 decline and/or become more volatile.

We may remain an “emerging growth company” until as late as December 31, 2020 (the fiscal year end following the fifth anniversary of the closing of our initial public offering, which occurred on May 18, 2015), although we may cease to be an “emerging growth company” earlier under certain circumstances, including (i) if the market value of our common stock that is held by non affiliates exceeds $700.0 million as of any June 30, in which case we would cease to be an “emerging growth company” as of December 31 of such year, (ii) if our gross revenue exceeds $1.0 billion in any fiscal year or (iii) if we issue more than $1.0 billion of non convertible debt over a three year period.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our corporate headquarters are located in San Francisco, California, where we lease approximately 6,311 square feet of office space under an operating lease. Our lease agreement expires on September 30, 2020. We believe that our existing facilities are adequate for our near term needs.

ITEM 3. LEGAL PROCEEDINGS

March 2018 Demand Letter relating to 2018 Special Meeting of Stockholders

While not a legal proceeding, on March 27, 2018, we received a demand letter from a law firm representing a purported stockholder, relating to certain approvals obtained at a special meeting of stockholders on March 12, 2018 (the “2018 Special Meeting”). The demand letter alleges that we miscalculated the votes with respect to (i) the proposal to amend our Third Amended and Restated Certificate of Incorporation as filed with Secretary of State of the State of Delaware on March 15, 2018 (the “COI”), which increased the authorized shares of Common Stock from 250,000,000 to

500,000,000 (the “Share Increase Proposal”) and (ii) the proposal to amend the COI to effect a reverse stock split at a ratio of not less than 1 for 1.2 and not greater than 1 for 10 (the “Former Reverse Stock Split Proposal”).We did not implement the Former Reverse Stock Split Proposal. In addition, at the 2018 annual meeting of stockholders held on May 18, 2018, stockholders approved amendments to the COI to (i) effect a reverse stock split at a ratio of not less than 1 for 11 and not greater than 1 for 15 and (ii) decrease the number of authorized shares of Common Stock to 150,000,000.

On September 5, 2018, we responded to the law firm, indicating that the Board unanimously rejected the demands set forth in the demand letter (the “Demand Letter Claims”). While no proceedings with respect to the demand letter were ever initiated and we believe that the allegations set forth in the demand letter were without merit and would

Table of Contents

have vigorously defended against any such proceeding, the Demand Letter Claims were settled with a release of all such claims in March 2019 without any material financial settlement costs incurred by us.

July 2017 Complaint Relating to the Merger

On July 20, 2017, a putative class action complaint was filed in the United States District Court, Northern District of California, Civil Action No. 3:17 cv 04102, by Tony Plant (the "Plaintiff") on behalf of shareholders of the Company who held shares on September 30, 2017 and were entitled to vote at the 2017 Special Shareholders Meeting, against the Company and certain individuals who were directors as of the date of the vote (collectively, the "Defendants"), in a matter captioned Tony Plant v. Jaguar Animal Health, Inc., et al., making claims arising under Section 14(a) and Section 20(a) of the Exchange Act and Rule 14a 9, 17 C.F.R. § 240.14a 9, promulgated thereunder by the SEC. The claims alleged false and misleading information provided to investors in the Joint Proxy Statement/Prospectus on Form S 4 (File No. 333 217364) declared effective by the SEC on July 6, 2017 related to the solicitation of votes from shareholders to approve the merger and certain transactions related thereto. We accepted service of the complaint and summons on behalf of itself and the United States based director Defendants on November 1, 2017. We have not accepted service on behalf of, and Plaintiff has not yet served, the non U.S. based director Defendants.

On October 3, 2017, Plaintiff filed a motion seeking appointment as lead plaintiff and appointment of Monteverde & Associates PC as lead counsel. That motion was granted. Plaintiff filed an amended complaint against the Company and the United States based director Defendants on January 10, 2018. The Defendants filed a motion to dismiss on March 12, 2018, for which oral arguments were held on June 14, 2018. The court dismissed the complaint on September 20, 2018. Plaintiff was entitled to amend the complaint within 20 days from the date of dismissal. On October 10, 2018, Plaintiff amended the complaint to focus on our commercial strategy in support of Equilevia and the related disclosure statements in the Form S 4 described above. On November 6, 2018, the Defendants moved to dismiss the second amended complaint. The Defendants argue in their motion that the complaint fails to state a claim upon which relief can be granted because the omissions and misrepresentations alleged in the complaint are immaterial as a matter of law. The court has elected to rule on Defendants' motion to dismiss without holding oral arguments.If the Plaintiff were able to prove its allegations in this matter and to establish the damages it asserts, then an adverse ruling could have a material impact on us. We believe that it is not probable that an asset has been impaired or a liability has been incurred as of the date of the financial statements and the amount of any potential loss is not reasonably estimable.

Other than as described above, there are currently no claims or actions pending against us, the ultimate disposition of which could have a material adverse effect on our results of operations, financial condition or cash flows.

ITEM 4. MINE SAFETY DISCLOSURE

Not applicable.

Table of Contents

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Our common stock trades on The NASDAQ Capital Market under the symbol "JAGX."

Holders

As of March 31, 2019, there were approximately 31 stockholders of record of our common stock. These figures do not reflect the beneficial ownership or shares held in nominee name, nor do they include holders of any RSUs.

Dividend Policy

We have never paid any cash dividends on our common stock to date. We currently anticipate that we will retain all future earnings, if any, to fund the development and growth of our business and do not anticipate paying any cash dividends for at least the next five years, if ever.

Recent Sales of Unregistered Securities

Other than as provided on our quarterly reports on Form 10-Q filed with the SEC on May 15, 2018, August 13, 2018 and November 19, 2018 and our current reports on Form 8 K filed with the SEC on January 2, 2018, February 16, 2018, March 2, 2018, March 27, 2018, and September 12, 2018, there were no unregistered sales of equity securities during the period.

The offers, sales, and issuances of the securities described above were deemed to be exempt from registration under the Securities Act in reliance on Section 4(a)(2) of the Securities Act, Regulation D or Regulation S 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 or sophisticated person and had adequate access, through employment, business or other relationships, to information about us.

ITEM 6. SELECTED FINANCIAL DATA

Not Applicable.

Table of Contents

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis should be read together with our financial statements and the related notes appearing elsewhere in this report.

Overview

We are a commercial stage pharmaceuticals company focused on developing novel, sustainably derived gastrointestinal products on a global basis. Our wholly-owned subsidiary, Napo Pharmaceuticals, Inc. ("Napo"), focuses on developing and commercializing proprietary human gastrointestinal pharmaceuticals for the global marketplace from plants used traditionally in rainforest areas. Our Mytesi (crofelemer) product is approved by the U.S. Food and Drug Administration ("FDA") for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy. In the field of animal health, we are focused on developing and commercializing first-in-class gastrointestinal products for companion and production animals, foals, and high value horses.

Jaguar was founded in San Francisco, California as a Delaware corporation on June 6, 2013. Napo formed Jaguar to develop and commercialize animal health products. Effective as of December 31, 2013, Jaguar was a wholly-owned subsidiary of Napo, and Jaguar was a majority-owned subsidiary of Napo until the close of the Company's initial public offering on May 18, 2015. On July 31, 2017, the merger of Jaguar Animal Health, Inc. and Napo became effective, at which point Jaguar Animal Health's name changed to Jaguar Health, Inc. and Napo began operating as a wholly-owned subsidiary of Jaguar focused on human health and the ongoing commercialization of, and development of follow-on indications for, Mytesi.

We believe Jaguar is poised to realize a number of synergistic, value adding benefits—and an expanded pipeline of potential blockbuster human follow-on indications, a second-generation anti-secretory agent, as well as a pipeline of important animal indications for crofelemer, upon which to build global partnerships. Jaguar, through Napo, now holds extensive global rights for Mytesi, and crofelemer manufacturing is being conducted at a multimillion-dollar commercial manufacturing facility that has been FDA-inspected and approved. Additionally, several of the drug product candidates in Jaguar's Mytesi pipeline are backed by strong Phase 2 evidence from completed Phase 2 trials.

Mytesi is a novel, first-in-class anti-secretory agent which has a basic normalizing effect locally on the gut, and this mechanism of action has the potential to benefit multiple disorders. Mytesi is in development for multiple possible follow on indications, including diarrhea related to targeted cancer therapy; orphan drug indications for infants and children with congenital diarrheal disorders and short bowel syndrome (SBS); supportive care for inflammatory bowel disease (IBD); irritable bowel syndrome (IBS); and for idiopathic/functional diarrhea. In addition, a second generation proprietary anti secretory agent is in development for cholera. Mytesi has received orphan-drug designation for SBS.

Financial Operations Overview

On a consolidated basis, we have not yet generated enough revenue to date to achieve break even or positive cash flow, and we expect to continue to incur significant research and development and other expenses. Our net loss was $32.1 million and $22.0 million for the years ended December 31, 2018 and 2017, respectively. As of December 31, 2018, we had total stockholders' equity of $5.4 million, an accumulated deficit of $94.6 million, and cash of $2.6 million. We expect to continue to incur losses and experience increased expenditures for the foreseeable future as we expand our product development activities, seek necessary approvals for our product candidates, conduct species-specific formulation studies for our non-prescription products, establish API manufacturing capabilities and begin additional commercialization activities.

73

Table of Contents

Revenue

Our product and collaboration revenue consists of the following:

- Revenues from the sale of our human drug Mytesi, which is sold through distributors and wholesalers.
- Revenues from the sale of our animal products branded as Neonorm Calf and Neonorm Foal. Our Neonorm and Botanical extract products are primarily sold to distributors, who then sell the products to the end customers.
- Revenues from our collaborative agreement with Elanco to license, develop and commercialize Canalevia. This agreement was terminated in January 2018.

See “Results of Operations” below for more detailed discussion on revenues

Cost of Revenue

Cost of revenue consists of direct drug substance and drug product materials expense, direct labor, distribution fees, royalties and other related expenses associated with the sale of our products.

Research and Development Expense

Research and development expenses consist primarily of clinical and contract manufacturing expense, personnel and related benefit expense, stock based compensation expense, employee travel expense and reforestation expenses. Clinical and contract manufacturing expense consists primarily of costs to conduct stability, safety and efficacy studies, and manufacturing startup expenses at an outsourced API provider in Italy.

We typically use our employee and infrastructure resources across multiple development programs. We track outsourced development costs by prescription drug product candidate and non prescription product but do not allocate personnel or other internal costs related to development to specific programs or development compounds.

The timing and amount of our research and development expenses will depend largely upon the outcomes of current and future trials for our prescription drug product candidates as well as the related regulatory requirements, the outcomes of current and future species specific formulation studies for our non prescription products, manufacturing costs and any costs associated with the advancement of our line extension programs. We cannot determine with certainty the duration and completion costs of the current or future development activities.

The duration, costs and timing of trials, formulation studies and development of our prescription drug and non prescription products will depend on a variety of factors, including:

- the scope, rate of progress, and expense of our ongoing, as well as any additional clinical trials, formulation studies and other research and development activities;
- future clinical trial and formulation study results;
- potential changes in government regulations; and
- the timing and receipt of any regulatory approvals.

A change in the outcome of any of these variables with respect to the development of a prescription drug product candidate or non prescription product could mean a significant change in the costs and timing associated with our development activities.

Table of Contents

We expect research and development expense to increase significantly as we add personnel, commence additional clinical studies and other activities to develop our prescription drug product candidates and non prescription products.

Sales and Marketing Expense

Sales and marketing expenses consist of personnel and related benefit expense, stock based compensation expense, direct sales and marketing expense, employee travel expense, and management consulting expense. We currently incur sales and marketing expenses to promote Mytesi and Neonorm calf and foal sales.

We expect sales and marketing expenses to increase significantly as we develop and commercialize new products and grow our existing Neonorm market. We will need to add sales and marketing headcount to promote the sales of existing and new products.

General and Administrative Expense

General and administrative expenses consist of personnel and related benefit expense, stock based compensation expense, employee travel expense, legal and accounting fees, rent and facilities expense, and management consulting expense.

We expect general and administrative expense to increase in order to enable us to effectively manage the overall growth of the business. This will include adding headcount, enhancing information systems and potentially expanding corporate facilities.

Interest Expense

Interest expense consists primarily of non-cash and cash interest costs related to our borrowings.

Critical Accounting Policies and Significant Judgments and Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles, or U.S. GAAP, requires the use of estimates and assumptions that affect the reported amounts of assets and liabilities, revenues and expenses, and related disclosures in the financial statements. Critical accounting policies are those accounting policies that may be material due to the levels of subjectivity and judgment necessary to account for highly uncertain matters or the susceptibility of such matters to change, and that have a material impact on financial condition or operating performance. While we base our estimates and judgments on our experience and on various other factors that we believe to be reasonable under the circumstances, actual results may differ from these estimates under different assumptions or conditions. We believe the following critical accounting policies used in the preparation of our financial statements require significant judgments and estimates. For additional information relating to these and other accounting policies, see Note 2 to our audited financial statements, appearing elsewhere in this report.

Revenue Recognition

The Company recognizes revenue in accordance with ASC Topic 606, Revenue from Contracts with Customers (“ASC 606”), which was adopted on January 1, 2018, using the modified retrospective method, which was elected to apply to all active contracts as of the adoption date. Application of the modified retrospective method did not impact amounts previously reported by the Company, nor did it require a cumulative effect adjustment upon adoption, as the Company's method of recognizing revenue under ASC 606 yielded similar results to the method utilized immediately prior to adoption. Accordingly, there was no effect to each financial statement line item as a result of applying the new

revenue standard.

Table of Contents

Practical Expedients, Elections, and Exemptions

We recognize revenue in accordance with the core principal of ASC 606 or when there is a transfer of control of promised goods or services to customers in an amount that reflects the consideration that we expect to be entitled to in exchange for those goods or services.

We used a practical expedient available under ASC 606 10 65 1(f)4 that permits us to consider the aggregate effect of all contract modifications that occurred before the beginning of the earliest period presented when identifying satisfied and unsatisfied performance obligations, transaction price, and allocating the transaction price to the satisfied and unsatisfied performance obligations.

We also used a practical expedient available under ASC 606 10 32 18 that permits us not to adjust the amount of consideration for the effects of a significant financing component if, at contract inception, the expected period between the transfer of promised goods or services and customer payment is one year or less.

We have elected to treat shipping and handling activities as fulfillment costs.

Additionally, we have elected to record revenue net of sales and other similar taxes.

Contracts

Napo entered into a Marketing and Distribution Agreement (“M&D Agreement”) with BexR Logistix, LLC (“BexR” or “Mission Pharmacal” or “Mission”), in April 2016 to appoint BexR as its distributor with the right to market and sell, and the exclusive right to distribute Mytesi (formerly Fulyzaq) in the US. Napo sells Mytesi through Mission, who then sells Mytesi to its distributors and wholesalers — McKesson, Cardinal Health, AmerisourceBergen Drug Corporation (“ABC”), HD Smith, Smith Drug and Publix (together “Distributors”). Mission sells Mytesi to their Distributors, on behalf of Napo, under agreements executed by Mission with these Distributors and Napo abides by the terms and conditions of sales agreed to between Mission and their Distributors. Health care providers order Mytesi through pharmacies who obtain Mytesi through Mission's Distributors. Napo considers Mission as the sales agent and the Distributors of Mission as its customers. Napo retains control of Mytesi held at Mission.

Mission's Distributors are our customers with respect to purchase of Mytesi. The M&D Agreement with Mission, Mission's agreement with the Distributors and the related purchase order will together meet the contract existence criteria under ASC 606 10 25 1. This M&D Agreement with Mission was amended on August 15, 2018, with a termination date of January 31, 2019. Mission agreed to continue to serve as the exclusive distributor for Mytesi on a transition basis until this date. Effective January 31, 2019, the Company entered into a Distribution Agreement with Cardinal Health to replace Mission as the sales agent.

Our Neonorm and Botanical extract products are primarily sold to distributors, who then sell the products to the end customers. Since 2014, we entered into several distribution agreements with established distributors such as Animart, Vedco, VPI, RJ Matthews, Henry Schein, and Stockmen Supply to distribute the Company's products in the United States, Japan, and China. The distribution agreements and the related purchase order together meet the contract existence criteria under ASC 606 10 25 1. Jaguar sells directly to its customers without the use of an agent.

Performance obligations

For the products sold by each of Napo and Jaguar, the single performance obligation identified above is our promise to transfer our Mytesi product to Distributors based on specified payment and shipping terms in the arrangement. Product warranties are assurance type warranties that do not represent a performance obligation.

76

Table of Contents

Transaction price

For both Jaguar and our Napo subsidiary, the transaction price is the amount of consideration to which we expect to collect in exchange for transferring promised goods or services to a customer. The transaction price of Mytesi and Neonorm is the Wholesaler Acquisition Cost (“WAC”), net of estimated discounts, returns, and price adjustments.

Allocate transaction price

For both Jaguar and our Napo subsidiary, the entire transaction price is allocated to the single performance obligation contained in each contract.

Point in time recognition

For both Jaguar and our Napo subsidiary, a single performance obligation is satisfied at a point in time, upon the FOB terms of each contract when control, including title and all risks, has transferred to the customer.

Goodwill and Indefinite-lived Intangible Assets

Goodwill

Goodwill is tested for impairment on an annual basis and in-between annual tests if events or circumstances indicate that an impairment loss may have occurred. The test is based on a comparison of the reporting unit's book value to its estimated fair market value. We perform the annual impairment test during the fourth quarter of each fiscal year using the opening consolidated balance sheet as of the first day of the fourth quarter, with any resulting impairment recorded in the fourth quarter of the fiscal year. If the carrying value of a reporting unit's net assets exceeds its fair value, the goodwill would be considered impaired and would be reduced to its fair value. In the June 2017 Napo Merger, goodwill was allocated entirely to the human health reporting unit.

The goodwill impairment analysis performed in the fourth quarter of fiscal year 2018. The decline in market capitalization during fiscal year 2018 was determined to be a triggering event for potential goodwill impairment. Accordingly, the Company performed the goodwill impairment analysis and determined that the Company’s entire goodwill balance was impaired, and consequently the Company wrote-off the entire balance. The Company recorded impairment charges of $5.2 million and $16.8 million during the years ended December 31, 2018 and 2017, respectively. The conditions that gave rise to the fiscal year 2018 impairment charge were due to the total of the fair value of total invested capital and non-interest bearing liabilities being less than the book value of total assets.

Indefinite-lived Intangible Assets

Acquired in-process research and development (IPR&D) are intangible assets initially recognized at fair value and classified as indefinite-lived assets until the successful completion or abandonment of the associated research and development efforts. During the development period, these assets will not be amortized as charges to earnings; instead these assets will be tested for impairment on an annual basis or more frequently if impairment indicators are identified. Based on the results of our impairment test, the Company recorded an impairment charge of zero and $2.3 million during the years ended December 31, 2018 and 2017, respectively. In connection with each annual impairment assessment and any interim impairment assessment in which indicators of impairment have been identified, we compare the fair value of the asset as of the date of the assessment with the carrying value of the asset on the consolidated balance sheet. If impairment is indicated by this test, the intangible asset is written down by the amount by which the discounted cash flows expected from the intangible asset exceeds its carrying value.

Accrued Research and Development Expenses

As part of the process of preparing our financial statements, we are required to estimate accrued research and development expenses. Estimated accrued expenses include fees paid to vendors and clinical sites in connection with

Table of Contents

our clinical trials and studies. We review new and open contracts and communicate with applicable internal and vendor personnel to identify services that have been performed on our behalf and estimate the level of service performed and the associated costs incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost for accrued expenses. The majority of our service providers invoice us monthly in arrears for services performed or as milestones are achieved in relation to our contract manufacturers. We make estimates of our accrued expenses as of each reporting date.

We base our accrued expenses related to clinical trials and studies on our estimates of the services received and efforts expended pursuant to contracts with vendors, our internal resources, and payments to clinical sites based on enrollment projections. The financial terms of the vendor agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. Payments under some of these contracts depend on factors such as the successful enrollment of animals and the completion of development milestones. We estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the related expense accrual accordingly on a prospective basis. If we do not identify costs that have been incurred or if we underestimate or overestimate the level of services performed or the costs of these services, our actual expenses could differ from our estimates. To date, we have not made any material adjustments to our estimates of accrued research and development expenses or the level of services performed in any reporting period presented.

The Company expenses the total cost of a certain long-term manufacturing development contract ratably over the estimated life of the contract, or the total amount paid if greater.

Results of Operations

Comparison of the Years Ended December 31, 2018 and 2017

The following table summarizes the Company's results of operations with respect to the items set forth in such table for the years ended December 31, 2018 and 2017 together with the change in such items in dollars and as a percentage:

	Year Ended December 31,			
	2018	2017	Variance	Variance %
Product revenue	$ 4,238,756	$ 1,485,114	$ 2,753,642	185 %
Collaboration revenue	177,389	2,876,072	(2,698,683)	(94) %
Total revenue	4,416,145	4,361,186	54,959	126% %
Operating Expenses				
Cost of revenue	2,765,746	880,405	1,885,341	214 %
Research and development expense	5,154,748	4,269,455	885,293	21 %
Sales and marketing expense	9,831,576	3,083,739	6,747,837	219 %
General and administrative expense	12,277,222	11,247,647	1,029,575	9.2 %
Impairment of goodwill	5,210,821	16,827,000	(11,616,179)	(69) %
Impairment of long-lived intangible assets	—	2,300,000	(2,300,000)	(100) %
Total operating expenses	35,240,113	38,608,246	(3,368,133)	(9) %
Loss from operations	(30,823,968)	(34,247,060)	3,423,092	(10) %
Interest expense, net	(2,628,685)	(1,209,632)	(1,419,053)	117 %
Other income, net	315,691	88,549	227,142	257 %
Change in fair value of warrant liability, derivative liability and conversion option	331,016	695,341	(364,325)	(52) %

liability					
Gain on Valeant settlement	1,204,333	—	1,204,333	100	%
Loss on extinguishment of debt	(544,444)	(477,054)	(67,390)	14	%
Net loss before tax	(32,146,057)	(35,149,856)	3,003,799	(9)	%
Income tax benefit	—	13,181,242	(13,181,242)	(100)	%
Net loss	$ (32,146,057)	$ (21,968,614)	$ (10,177,443)	46	%

Table of Contents

Revenue

Product revenue

The increase in product revenue of $2.8 million for the year ended December 31, 2018 compared to 2017 was due to increased sales of Mytesi due to 2017 only including five months of Mytesi sales post the Napo merger completion effective July 31, 2017 while 2018 had twelve months of Mytesi sales. The increase in Mytesi sales were offset by a decline in Neonorm revenues.

Due to the Company's arrangements, including elements of variable consideration, gross product sales are reduced in order to reflect the expected consideration to arrive at net product sales. Deductions to reduce gross product sales to net product sales for the years ended December 31, 2018 and 2017 are as follows:

	Year Ended December 31, 2018	2017	Variance	Variance %
Gross product sales				
Mytesi	$ 5,730,283	$ 1,237,204	$ 4,493,079	363 %
Neonorm	116,843	422,194	(305,351)	(72) %
Botanical Extract	—	78,000	(78,000)	— %
Total gross product sales	5,847,126	1,737,398	4,109,728	237 %
Medicare rebates	(184,339)	(25,365)	(158,974)	627 %
Sales discounts - Mytesi	(918,722)	(144,592)	(774,130)	535 %
Sales returns - Mytesi	(167,908)	(28,365)	(139,543)	492 %
Wholesaler fee - Mytesi	(337,401)	(53,962)	(283,439)	525 %
Net product sales	$ 4,238,756	$ 1,485,114	$ 2,753,642	185 %

Collaboration revenue

The decrease in collaboration revenue of $2.7 million for the year ended December 31, 2018 compared to the same period in 2017 was due to termination of the commercialization agreement with Elanco US Inc. in January 2018. Under this arrangement, signed in January 2017, we recognized collaboration revenue of $0.2 million and $2.9 million for the years ended December 31, 2018 and 2017, respectively, for the licensing, development and commercialization of Canalevia.

Cost of Product Revenue

Year Ended December 31, 2018	2017	Variance	Variance %

Cost of Product Revenue					
Material cost	$ 1,329,432	$ 570,420	$ 759,011	133	%
Direct labor	579,412	148,475	430,937	290	%
Distribution fees	460,551	115,852	344,699	298	
Royalties	138,494	38,689	99,805	258	%
Other	257,858	6,968	250,890	3601	%
Total	$ 2,765,746	$ 880,404	$ 1,885,342	214	%

The increase in cost of product revenue of $1.9 million for the year ended December 31, 2018 compared to 2017 was primarily due to increased sales of Mytesi due to 2017 only including five months of cost of product revenue post the Napo merger completion effective July 31, 2017, while 2018 had twelve months of costs of product revenue.

Table of Contents

Research and Development Expense

The following table presents the components of research and development (R&D) expense for the years ended December 31, 2018 and 2017:

	Year Ended December 31, 2018	2017	Variance	Variance %
R&D:				
Personnel and related benefits	$ 2,207,199	$ 2,162,251	$ 44,948	2.1 %
Materials expense and tree planting	195,792	248,010	(52,218)	(21.1) %
Travel, other expenses	120,334	189,622	(69,288)	(36.5) %
Clinical and contract manufacturing	1,145,594	439,071	706,523	160.9 %
Stock-based compensation	579,641	216,932	362,709	167.2 %
Other	906,188	1,013,569	(107,381)	(10.6) %
Total	$ 5,154,748	$ 4,269,455	$ 885,293	20.7 %

The increase in research and development expense of $885,293 for the year ended December 31, 2018 compared to the same period in 2017 was due primarily to: an increase in contract manufacturing costs due to the completion of SP 303 API manufacturing readiness work, for costs associated with the implementation and maintenance of serialization, and for costs for in-process Mytesi drug product readiness work in 2018. Clinical trial work decreased due to the temporary termination of Canalevia studies. In addition, stock-based compensation increased $362,709 primarily due to an increase in the number of option grants.

Sales and Marketing Expense

The following table presents the components of sales and marketing (S&M) expense for the years ended December 31, 2018 and 2017 together with the change in such components in dollars and as a percentage:

	Year Ended December 31, 2018	2017	Variance	Variance %
S&M:				
Personnel and related benefits	$ 4,237,472	$ 753,944	$ 3,483,528	462.0 %
Stock-based compensation	96,730	32,325	64,405	199.2 %
Direct Marketing Fees	3,891,286	1,491,869	2,399,417	160.8 %
Other	1,606,088	805,601	800,487	99.4 %
Total	$ 9,831,576	$ 3,083,739	$ 6,747,837	218.8 %

The increase sales and marketing expense of $6,747,837 for the year ended December 31, 2018 compared to the same period in 2017 was due primarily to (i) an increase in personnel and related benefit costs associated with the expansion

of our sales and marketing headcount from zero to 19 in support of Mytesi; (ii) an increase in direct marketing and sales expense due to the increase in marketing programs to promote the Napo Mytesi product; and (iii) an increase in other miscellaneous costs.

Table of Contents

General and Administrative Expense

The following table presents the components of general and administrative (G&A) expense for the years ended December 31, 2018 and 2017:

	Year Ended December 31, 2018	2017	Variance	Variance %
G&A:				
Personnel and related benefits	$ 1,744,733	$ 1,810,132	$ (65,399)	(3.6) %
Accounting fees	590,712	740,959	(150,247)	(20.3) %
Third-party consulting fees and Napo service fees	2,103,880	1,470,737	633,143	43.0 %
Legal fees	2,252,203	3,462,769	(1,210,566)	(35.0) %
Travel	282,268	303,601	(21,333)	(7.0) %
Stock-based compensation	1,347,503	565,356	782,147	138.3 %
Rent and lease expense	530,223	336,435	193,788	57.6 %
Public company expenses	664,733	777,629	(112,896)	(14.5) %
Other	2,760,967	1,780,029	980,938	55.1 %
Total	$ 12,277,222	$ 11,247,647	$ 1,029,575	9.2 %

The increase in general and administrative expenses of $1,029,575 for the year ended December 31, 2018 compared to the same period in 2017 was due primarily to (i) an increase in other general and administrative costs of $980,938 driven by an increase in intangible asset amortization of intangible assets acquired as part of the July 2017 merger with Napo; (ii) an increase in stock based compensation due to a significant increase in the volume of option grants to new and existing employees; and (iii) an increase in consulting fees. These increases were partially offset by a reduction in merger-related legal fees period over period. Public company expenses primarily consist of legal, printing, transfer agent, investor relations, SEC fees and other expense incurred once public compliance was necessary.

Interest Expense, net

The increase in interest expense of $1,419,053 million for the year ended December 31, 2018 compared to the same period in 2017 was due to debt extinguishments in fiscal year 2018 and slightly increased debt discount amortization on a net basis.

Other income, net

The increase in Other income, net of $227,142 for the year ended December 31, 2018 compared to the same period in 2017 was due to miscellaneous non-operating activities in fiscal year 2018, such as the extinguishment of the conversion option liability of $286,274, an unrealized foreign currency gain of $14,392 and an insurance reimbursement of $15,227.

Change in fair value of warrant liability, derivative liability and conversion option liability

The gain of $331,016 is due to the change in the fair value of the warrant liability, derivative liability and conversion option liability for the year ending December 31, 2018 represents a gain of $494,770 from the remeasurement of the the November 2016 Series A warrants and the October 2018 Underwriter warrants, a gain of $11,000 from the write-off of the derivative liability, offset by a loss of $174,754 on the write-off of the conversion option liability.

Gain on Valeant settlement

In September 2018, the Company received a $1.2 million payment from Valeant, in a settlement agreement with Glenmark Pharmaceuticals, Valeant Pharmaceuticals Ireland, Limited, and Salix Pharmaceuticals, related to inventory that was in negotiations of title on July 31, 2017, the date of the merger with Napo. Accordingly, this was the

Table of Contents

settlement of a contingency acquired in the July 2017 Napo merger. The Company recorded the one-time settlement outside of operations as it was related to the July 2017 Napo merger.

Loss on extinguishment of debt

The loss on extinguishment of debt of $544,444 relates to modifications of outstanding debt whose terms were modified resulting in extinguishment accounting.

Liquidity and Capital Resources

Sources of Liquidity

We have incurred net losses since our inception. For the years ended December 31, 2018 and 2017, we had net losses of $32.1 million and $22.0 million, respectively, and we expect to incur additional losses in the near-term future At December 31, 2018, we had an accumulated deficit of $94.6 million. To date, we have generated only limited revenue, and we may never achieve revenue sufficient to offset our expenses.

We had cash of $2.6 million as of December 31, 2018. We do not believe our existing cash and cash equivalents will be sufficient to meet our anticipated cash requirements for the next 12 months. Our independent registered public accounting firm has included an explanatory paragraph in its audit report included in our Form 10 K for the years ended December 31, 2018 and 2017 regarding our assessment of substantial doubt about our ability to continue as a going concern. Our financial statements do not include any adjustments that may result from the outcome of this uncertainty.

We have funded our operations primarily through the issuance of equity and debt financing, in addition to sales of our commercial products. Our primary funding sources in fiscal year 2018 are as follows:

- In the first quarter of 2018, the Company issued 820,953 shares of its common stock in exchange for redemption of certain convertible debt.
- In February 2018, the Company issued a promissory note for cash proceeds of $1,560,000, representing a principal amount of $2,240,909 less a discount of $680,909.
- In March 2018, the Company issued a promissory note for cash proceeds of $750,000, representing a principal amount of $1,090,341 less a discount of $315,341.
- In March 2018, the Company issued 285,694 shares of its common stock in lieu of cash payment of interest expense on its long-term convertible debt.
- In March 2018, the Company issued 5,524,926 shares of its Series A convertible preferred stock for net cash proceeds of $9,199,001.
- In March 2018, concurrent with the March 2018 preferred stock financing, the Company issued 1,960,794 shares of its common stock to certain institutional investors in exchange for $5.0 million in cash.
- In September 2018, the Company issued a convertible promissory note for cash proceeds of $400,000, representing a principal amount of $455,000 less a discount of $55,0000. In October 2018, the Company paid off the entire Note.
- In September 2018, the Company issued a convertible promissory note for cash proceeds of $100,000, representing a principal amount of $111,250 less a discount of $11,250. In October 2018, the Company paid off the entire Note.

Table of Contents

- In October 2018, the Company had a public offering of common shares and pre-funded warrants, with gross proceeds of $9,000,000, or $7,081,451 net of issuance costs.

We expect our expenditures will continue to increase as we continue our efforts to develop our products and continue development of our pipeline in the near term. We do not believe our current capital is sufficient to fund our operating plan through December 2019. We will need to seek additional funds through public or private equity or debt financings or other sources, such as strategic collaborations. Such financing may result in dilution to stockholders, imposition of debt covenants and repayment obligations or other restrictions that may affect our business. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. We may also not be successful in entering into partnerships that include payment of upfront licensing fees for our products and product candidates for markets outside the United States, where appropriate. If we do not generate upfront fees from any anticipated arrangements, it would have a negative effect on our operating plan. We plan to finance our operations and capital funding needs through equity and/or debt financing as well as revenue from future product sales. However, there can be no assurance that additional funding will be available to us on acceptable terms on a timely basis, if at all, or that we will generate sufficient cash from operations to adequately fund operating needs or ultimately achieve profitability. If we are unable to obtain an adequate level of financing needed for the long-term development and commercialization of our products, we will need to curtail planned activities and reduce costs. Doing so will likely have an adverse effect on our ability to execute on our business plan. These matters raise substantial doubt about the ability of the Company to continue in existence as a going concern within one year after issuance date of the financial statements.

Cash Flows for Year Ended December 31, 2018 Compared to the Year Ended December 31, 2017

The following table shows a summary of cash flows for the years ended December 31, 2018 and 2017:

	Year Ended December 31,	
	2018	2017
Total cash used in operations	$ (22,730,832)	$ (9,824,940)
Total cash used in investing activities	(6,527)	(1,285,215)
Total cash provided by financing activities	24,545,683	10,679,874
	$ 1,808,324	$ (430,281)

Cash Used in Operating Activities

During the year ended December 31, 2018, cash used in operating activities of $22.7 million resulted from our net loss of $32.1 million, adjusted by non cash depreciation and amortization expense of $1.3 million, goodwill impairment of $5.2 million, stock based compensation of $2.0 million, a debt extinguishment loss of $0.5 million, accretion of interest expense from debt discount and issuance costs of $1.2 million, offset by net of changes in operating assets and liabilities of $0.9 million.

During the year ended December 31, 2017, cash used in operating activities of $9.8 million resulted from our net loss of $22.0 million, adjusted by noncash accretion of end of term payment, debt discounts and debt issuance costs of $600,000, stock-based compensation of $815,000, change in fair value of modified warrants of $23,000, reduction in the fair value of warrant liability of $695,000, loss on extinguishment of debt of $477,000, stock issued in the merger in exchange for services $151,000, common stock issued in exchange for services rendered of $44,000, depreciation and amortization expenses of $584,000, interest paid on the conversion of debt to equity of $79,000, impairment of

goodwill of $16.8 million, impairment of long-lived intangible assets of $2,300,000 deferred income benefit of $13.2 million, and gain on revaluation of derivative liability of $9,000, net of changes in operating assets and liabilities of $4.1 million.

Cash Used In Investing Activities

During the year ended December 31, 2018, cash used in investing activities of $6,527 consisted of cash used to purchase property.

Table of Contents

During the year ended December 31, 2017, cash used in investing activities of $1.3 million consisted of cash used in acquisition, net of cash acquired of $1.6 million offset by $272,000 of release of restricted cash that resulted from principal payments of our long-term debt.

Cash Provided by Financing Activities

During the year ended December 31, 2018, net cash provided by financing activities of $24.6 million primarily consisted of $1.3 million and $750,000 received in separate PIPE financings, $14.6 million in net proceeds from the Sagard financing, including $5.0 million in net proceeds received from the issuance of common stock and $9.0 million in net proceeds received from the issuance of convertible preferred stock, and $2.6 million received in the issuance of debt, offset by $2.3 million in principal payments of our long-term and convertible debt.

During the year ended December 31, 2017, cash used in financing activities of $10,679,874 consisted of $3.5 million of net proceeds received in a follow on registration statement, $555,000 and $401,000 received in separate PIPE financings, $2.3 million in net proceeds received in the CSPA, $94,000 in net proceeds received in a PIPE financing, $1.7 million received in the issuance of convertible debt, $1.1 million received in the issuance of non convertible debt, $3.0 million received from the sale of common stock in the merger, and $363,000 received in the exercise of certain warrants, offset by $2.4 million in principal payments of our long term debt.

Off Balance Sheet Arrangements

Since inception, we have not engaged in the use of any off balance sheet arrangements, such as structured finance entities, special purpose entities or variable interest entities.

JOBS Act

In April 2012, the JOBS Act was enacted. Section 107 of 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. Thus, an emerging growth company can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this extended transition period, and, as a result, we will adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for other public companies.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Not applicable.

Table of Contents

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Jaguar Health, Inc.

Index to Financial Statements

Table of Contents

Report of Independent Registered Public Accounting Firm

Board of Directors and Stockholders

Jaguar Health, Inc.

San Francisco, California

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Jaguar Health, Inc. (formerly Jaguar Animal Health, Inc.)(the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, stockholders' equity (deficit), and cash flows for each of the two years in the period ended December 31, 2018. In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of their operations and their cash flows for each of the two years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

Going Concern Uncertainty

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the consolidated financial statements, the Company has suffered recurring losses from operations and an accumulated deficit that raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company has changed its accounting method for recognizing revenue from contracts with customers in fiscal year 2018 due to the adoption of Topic 606: Revenue from Contracts with Customers.

Basis for Opinion

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures

included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

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

/s/ BDO USA, LLP

San Francisco, California

April 10, 2019

Table of Contents

JAGUAR HEALTH

CONSOLIDATED BALANCE SHEETS

	December 31, 2018	December 31, 2017
Assets		
Current assets:		
Cash	$ 2,568,191	$ 520,698
Restricted cash	—	239,169
Accounts receivable	995,683	467,658
Other receivable	6,118	1,380
Inventory	3,342,177	2,072,817
Prepaid expenses and other current assets	1,237,772	497,373
Total current assets	8,149,941	3,799,095
Property and equipment, net	760,617	1,222,068
Goodwill	—	5,210,821
Intangible assets, net	31,710,556	33,397,222
Other assets	420,831	—
Total assets	$ 41,041,945	$ 43,629,206
Liabilities, convertible preferred stock and stockholders' equity (deficit)		
Current liabilities:		
Accounts payable	$ 5,414,260	$ 7,354,932
Deferred collaboration revenue	—	177,389
Accrued liabilities	4,939,441	2,204,133
Warrant liability	220,376	103,860
Derivative liability	—	11,000
Conversion option liability	—	111,841
Convertible debt - current, net of discount	11,239,170	2,672,215
Notes payable, net of discount	4,845,575	1,141,153
Current portion of long-term debt	—	1,609,244
Total current liabilities	26,658,822	15,385,767
Convertible debt - non-current, net of discount	—	10,982,437
Total liabilities	$ 26,658,822	$ 26,368,204
Commitments and contingencies (See Note 7)		
Series A convertible preferred stock: $0.0001 par value, 10,000,000 shares authorized at December 31, 2018 and 2017; 5,524,926 and 0 shares issued and outstanding at December 31, 2018 and 2017, repectively; (liquidation preference of $9,199,002 at December 31, 2018)	9,000,002	—
Stockholders' equity (deficit):		
Common stock: $0.0001 par value, 150,000,000 and 250,000,000 shares authorized at December 31, 2018 and 2017, respectively; 24,603,104 and	2,460	418

4,180,484 shares issued and outstanding at December 31, 2018 and 2017, respectively.		
Common stock - non-voting: $0.0001 par value, 50,000,000 shares authorized at December 31, 2018 and 2017; 40,301,237 and 42,617,893 shares issued and outstanding at December 31, 2018 and 2017, respectively.	4,030	4,262
Additional paid-in capital	99,927,410	79,661,044
Accumulated deficit	(94,550,779)	(62,404,722)
Total stockholders' equity	5,383,121	17,261,002
Total liabilities, convertible preferred stock and stockholders' equity (deficit)	$ 41,041,945	$ 43,629,206

The accompanying notes are an integral part of these consolidated financial statements.

Table of Contents

JAGUAR HEALTH

CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended December 31, 2018	2017
Product revenue	$ 4,238,756	$ 1,485,114
Collaboration revenue	177,389	2,876,072
Total revenue	4,416,145	4,361,186
Operating expenses		
Cost of product revenue	2,765,746	880,405
Research and development	5,154,748	4,269,455
Sales and marketing	9,831,576	3,083,739
General and administrative	12,277,222	11,247,647
Impairment of goodwill	5,210,821	16,827,000
Impairment of indefinite-lived assets	—	2,300,000
Total operating expenses	35,240,113	38,608,246
Loss from operations	(30,823,968)	(34,247,060)
Interest expense	(2,628,685)	(1,209,632)
Other income, net	315,691	88,549
Change in fair value of warrants, derivative liability and conversion option liability	331,016	695,341
Gain on Valeant settlement	1,204,333	—
Loss on extinguishment of debt	(544,444)	(477,054)
Net loss before income tax	(32,146,057)	(35,149,856)
Income tax benefit	—	13,181,242
Net loss	$ (32,146,057)	$ (21,968,614)
Net loss per share, basic and diluted	$ (2.19)	$ (7.59)
Weighted-average common shares outstanding, basic and diluted	14,681,044	2,895,729

The accompanying notes are an integral part of these consolidated financial statements.

Table of Contents

JAGUAR HEALTH

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (DEFICIT)

	Series A Preferred Stock		Common stock - voting		Common stock - non-voting		Additional	Accumulated
	Shares	Amount	Shares	Amount	Shares	Amount	paid-in capital	deficit
Balances - December 31, 2016			933,809	$ 93	—	$ —	$ 37,981,829	$ (40,436,108)
Issuance of common stock in association with a June 2016 private investment in public entities offering, net of offering costs of $72,710	—	—	264,819	26	—	—	2,314,347	—
Issuance of common stock in a private investment in public entities offering, net of offering costs of $6,000 June 2017	—	—	13,333	1	—	—	93,999	—
Issuance of common stock through a stock purchase agreement with a private investor, net of offering costs of $44,738 November 2017	—	—	340,000	34	—	—	555,228	—
Issuance of common stock in a private investment in public entities offering	—	—	267,333	27	—	—	400,973	—

Issuance of common stock in the merger	—	—	152,163	15	—	—	1,278,154	—
Issuance of common stock in a July 2017 CSPA	—	—	216,216	22	—	—	2,999,978	—
Issuance of common stock in a follow-on offering registration statement October 2017, net of commissions and offering costs of $763,502	—	—	1,445,833	145	—	—	3,573,853	—
Issuance of common stock - non-voting in the merger	—	—	—	—	43,173,288	4,317	24,172,725	—
Conversion of non-voting common stock to common stock	—	—	37,026	4	(555,395)	(55)	51	—
Issuance of warrants in the merger	—	—	—	—			630,859	—
Issuance of stock options in the merger	—	—	—	—	—	—	5,691	—
Issuance of RSUs in the merger	—	—	—	—	—	—	3,300,555	—
Issuance of common stock in exchange for warrants	—	—	60,556	6	—	—	386,328	—
Stock-based compensation	—	—	—	—	—	—	814,613	—
Warrants, issued in conjunction with debt extinguishment	—	—	—	—	—	—	207,713	—
Issuance of common stock in exchange for	—	—	914	—	—	—	—	—

vested restricted stock units								
Issuance of common stock in exchange for redemption of convertible debt	—	—	432,806	43	—	—	900,320	—
Issuance of common stock in exchange for services	—	—	15,676	2	—	—	43,827	—
Net loss	—	—	—	—	—	—	-	(21,968,614)
Balances - December 31, 2017	—	$ —	4,180,484	$ 418	42,617,893	$ 4,262	$ 79,661,044	$ (62,404,722)

Table of Contents

JAGUAR HEALTH

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (DEFICIT) (continued)

Series A Preferred Stock		Common stock - voting		Common stock - non-voting		Additional paid-in capital	Accumulated deficit	To Sto Eq
Shares	Amount	Shares	Amount	Shares	Amount			
—	—	4,180,484	418	42,617,893	4,262	79,661,044	(62,404,722)	
5,524,926	9,000,002	1,960,794	196	—	—	4,999,804	—	
—	(995,000)	—	—	—	—	995,000	—	
—	995,000	—	—	—	—	(995,000)	—	
—	—	716,425	72	—	—	1,305,702	—	
—	—	478,853	48	—	—	750,052	—	

rch ck for f	—	—	956,553	96	—	—	1,607,325	—
ck for rch	—	—	3,333	—	—	—	6,425	—
ck for nse f	—	—	285,694	29	—	—	704,696	—
ck ock	—	—	154,443	15	(2,316,656)	(232)	217	—
ck	—	—	320,743	32	—	—	479,776	—
ck	—	—	470,781	47	—	—	624,850	—
ck 018 ebt	—	—	75,000	7	—	—	47,993	—
018	—	—	—	—	—	—	118,149	—
018 ck	—	—	—	—	—	—	493,688	—
	—	—	—	—	—	—	(30)	—

—	—	11,575,001	1,157	—	—	5,025,293	—	
—	—	3,425,000	343	—	—	2,054,658	—	
—	—	—	—	—	—	23,894	—	
—	—	—	—	—	—	2,023,874	—	
—	—	—	—	—	—	—	(32,146,057)	(
5,524,926	$ 9,000,002	24,603,104	$ 2,460	40,301,237	$ 4,030	$ 99,927,410	$ (94,550,779)	$

The accompanying notes are an integral part of these consolidated financial statements.

Table of Contents

JAGUAR HEALTH, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31, 2018	2017
Cash flows from operating activities		
Net loss	$ (32,146,057)	$ (21,968,614)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization expense	1,319,003	584,339
Impairment of goodwill	5,210,821	16,827,000
Impairment of indefinite-lived assets	—	2,300,000
Deferred income tax benefit	—	(13,181,242)
Interest paid on the conversion of debt to equity	21,274	79,401
Common stock issued in exchange for services rendered	6,425	43,829
Common stock issued in Napo merger for services	—	151,351
Warrants issued for services	23,894	—
Loss on extinguishment of debt	544,444	477,054
Charge in relation to modification of warrants	—	23,000
Stock-based compensation	2,023,874	814,613
Amortization of debt issuance costs and debt discount	1,196,914	600,360
Change in fair value of warrants, conversion option and derivative liability	(6,325)	(704,341)
Changes in assets and liabilities		
Accounts receivable	(528,025)	(166,057)
Other receivable	(4,738)	(1,380)
Inventory	(1,269,360)	128,000
Prepaid expenses and other current assets	(111,616)	(143,926)
Deferred offering costs	—	72,710
Other non-current assets	(262,659)	122,163
Due from former parent	—	(164,647)
Deferred revenue	(177,389)	177,389
Deferred product revenue	—	(224,454)
Deferred rent	109,240	(2,372)
Accounts payable	(1,940,671)	4,188,890
Accrued expenses	3,260,119	141,994
Total cash used in operations	(22,730,832)	(9,824,940)
Cash flows from investing activities		
Purchase of equipment	(6,527)	—
Cash paid in Napo merger, net of cash acquired	—	(1,557,340)
Total cash used in investing activities	(6,527)	(1,557,340)
Cash flows from financing activities		
Proceeds from issuance of notes payable	2,564,938	1,100,000
Proceeds from issuance of convertible debt	474,000	1,700,000
Payments of long-term debt	(1,689,200)	(2,422,094)
Payments of convertible debt	(566,249)	

Issuance of common stock in a private investment in public entities - June 2016	—	2,314,374
Issuance of common stock through a stock purchase agreement with a private investor - November 2017	—	555,262
Issuance of common stock in a private investment in public entities offering - December 2017	—	495,000
Issuance of common stock in a follow-on offering registration statement, net - October 2017	—	3,573,998
Proceeds from issuance of common stock in the Napo merger	—	3,000,000
Issuance of common stock through the exercise of common stock warrants	—	363,334
Proceeds from issuance of common stock	7,055,874	—
Proceeds from issuance of convertible preferred stock	9,199,002	—
Proceeds from issuance of common stock July 2018	624,897	—
Issuance of common stock - public offering - October 2018	6,945,000	—
Payment of underwriting discounts, commissions and other associated offering costs	(2,117,550)	—
Issuance of common stock - exercise of prepaid equity forward contracts - October 2018	2,055,001	—
Fractional common stock shares repurchased	(30)	—
Total cash provided by financing activities	24,545,683	10,679,874
Net increase (decrease) in cash and restricted cash	1,808,324	(702,406)
Cash and restricted cash at beginning of period	759,867	1,462,273
Cash and restricted cash at end of period	$ 2,568,191	$ 759,867

Table of Contents

JAGUAR HEALTH, INC.

STATEMENTS OF CASH FLOWS (continued)

	Year Ended December 31, 2018	2017
Supplemental schedule of non-cash financing and investing activities		
Interest paid on long-term debt	$ 19,344	$ 234,550
Common stock issued as redemption of Jaguar notes payable and related interest	$ 1,153,408	$ —
Common stock issued as redemption of Napo notes payable and related interest	$ 1,638,546	$ —
Issuance of common stock in debt financing September 2018	$ 48,000	$ —
Issuance of warrants in debt financing September 2018	$ 118,149	$ —
Deemed dividend attributable to Series A convertible preferred stock	$ 995,000	$ —
Warrants issued with October 2018 offering	$ 611,286	$ —
Fair value of common stock issued in Napo merger	$ —	$ 25,303,859
Fair value of replacement of common stock warrants issued in Napo merger	$ —	$ 630,859
Fair value of replacement restricted stock units issued in Napo merger	$ —	$ 3,300,555
Fair value of replacement stock options issued in Napo merger	$ —	$ 5,691
Fair value of common stock issued as redemption of Jaguar notes payable	$ —	$ 601,312
Fair value of common stock issued as redemption of Napo notes payable	$ —	$ 299,050
Fair value of common stock issued in lieu of repayment of Napo debt	$ —	$ 2,000,000

Cash and Restricted Cash:	December 31, 2018	December 31, 2017
Cash	$ 2,568,191	$ 520,698
Restricted cash	—	239,169
Total cash and restricted cash	$ 2,568,191	$ 759,867

The accompanying notes are an integral part of these consolidated financial statements.

Table of Contents

Jaguar Health, Inc.

Notes to Financial Statements

1. Organization and Business

Jaguar Health, Inc. (“Jaguar”, “we” or the “Company”), formerly known as Jaguar Animal Health, Inc., was incorporated on June 6, 2013 (inception) in Delaware. The Company was a majority-owned subsidiary of Napo Pharmaceuticals, Inc. (“Napo” or the “Former Parent”) until the close of the Company's initial public offering on May 18, 2015. The Company was formed to develop and commercialize first-in-class gastrointestinal products for companion and production animals and horses. The Company's first commercial product, Neonorm Calf, was launched in 2014 and Neonorm Foal was launched in the first quarter of 2016. The Company's activities are subject to significant risks and uncertainties, including failing to secure additional funding in order to timely compete the development and commercialization of products.

On July 31, 2017, Jaguar completed a merger with Napo pursuant to the Agreement and Plan of Merger dated March 31, 2017 by and among Jaguar, Napo, Napo Acquisition Corporation (“Merger Sub”), and Napo's representative (the “Merger Agreement”). In accordance with the terms of the Merger Agreement, upon the completion of the merger, Merger Sub merged with and into Napo, with Napo surviving as our wholly-owned subsidiary (the “Merger” or “Napo Merger”). Immediately following the Merger, Jaguar changed its name from “Jaguar Animal Health, Inc.” to “Jaguar Health, Inc.” Napo now operates as a wholly-owned subsidiary of Jaguar focused on human health and the ongoing commercialization of Mytesi, a Napo drug product approved by the U.S. FDA for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy.

The Company manages its operations through two segments—human health and animal health and is headquartered in San Francisco, California.

Reverse stock-split

On May 18, 2018, the stockholders of Jaguar approved at the 2018 Annual Meeting of Stockholders of the Company and the Board approved, in accordance with the authority granted by the Company's stockholders at the Annual Meeting, a 1 for 15 reverse stock split of the Company's issued and outstanding shares of Common Stock, effective June 1, 2018. The reverse split has been reflected in all voting common stock, warrants, and common stock option shares disclosed in these financial statements. The non-voting common stock and the convertible preferred stock were excluded from the reverse split.

Liquidity and Going Concern

The accompanying consolidated financial statements have been prepared assuming the Company will continue as a going concern. The Company has incurred recurring operating losses since inception and has an accumulated deficit of $94.6 million as of December 31, 2018. The Company expects to incur substantial losses in future periods. Further, the Company’s future operations are dependent on the success of the Company’s ongoing development and commercialization efforts, as well as the securing of additional financing. There is no assurance that profitable operations, if ever achieved, could be sustained on a continuing basis.

The Company plans to finance its operations and capital funding needs through equity and/or debt financing, collaboration arrangements with other entities, as well as revenue from future product sales of Mytesi and Neonorm. However, there can be no assurance that additional funding will be available to the Company on acceptable terms on a timely basis, if at all, or that the Company will generate sufficient cash from operations, including sales of Mytesi, to

adequately fund operating needs or ultimately achieve profitability. If the Company is unable to obtain an adequate level of financing needed for the long-term development and commercialization of its products, the Company will need to curtail planned activities and reduce costs. Doing so will likely have an adverse effect on the Company's ability to execute on its business plan. These matters raise substantial doubt about the ability of the Company to continue in

Table of Contents

existence as a going concern within one year after issuance date of the financial statements. The accompanying financial statements do not include any adjustments that might result from the outcome of these uncertainties.

2. Summary of Significant Accounting Policies

Basis of Presentation

The financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP").

Principles of Consolidation

The consolidated financial statements have been prepared in accordance with US GAAP and applicable rules and regulations of the Securities and Exchange Commission (“SEC”) and include the accounts of the Company and its wholly owned subsidiaries. All inter-company transactions and balances have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires the Company’s management to make judgments, assumptions and estimates that affect the amounts reported in its financial statements and the accompanying notes. The accounting policies that reflect the Company’s more significant estimates and judgments and that the Company believes are the most critical to aid in fully understanding and evaluating its reported financial results are valuation of stock options; valuation of warrant liabilities; valuation of derivative liability, impairment testing of goodwill, acquired in-process research and development (“IPR&D"), and long lived assets; useful lives for depreciation and amortization; valuation adjustments for excess and obsolete inventory; allowance for doubtful accounts; deferred taxes and valuation allowances on deferred tax assets; evaluation and measurement of contingencies; and recognition of revenue, including estimates for product returns. Those estimates could change, and as a result, actual results could differ materially from those estimates.

Deferred Offering Costs

Deferred offering costs are costs incurred in filings of registration statements with the Securities and Exchange Commission. These deferred offering costs are offset against proceeds received upon the closing of the offerings. Upon the closing of its October 2018 offering, in which common stock and pre-funded warrants were issued as registered on Form S-1, the Company had deferred costs of $1.9 million, representing legal, accounting, printer and filing fees. These deferred offering costs were charged to stockholders’ equity when the offering closed on October 4, 2018.

Concentrations

Cash is the financial instrument that potentially subjects the Company to a concentration of credit risk as cash is deposited with a bank and cash balances are generally in excess of Federal Deposit Insurance Corporation (“FDIC”) insurance limits. The carrying value of cash approximates fair value at December 31, 2018 and 2017.

For the year ended December 31, 2018, substantially all of the Company's revenue has been derived from the sale of Mytesi. The Company earned Mytesi revenue primarily from three major pharmaceutical distributors in the

Table of Contents

United States, each of whom amounted to a percentage of total net revenue of at least 10%. Revenue earned from each as a percentage of total net revenue follows:

Consolidated (percentage of total net sales)	For the Year Ended December 31,			
	2018		2017	
Customer 1	32	%	11	%
Customer 2	31	%	9	%
Customer 3	26	%	12	%
	89	%	32	%

The Company is subject to credit risk from its accounts receivable related to its sales. The Company generally does not perform evaluations of customers' financial condition and generally does not require collateral. The Company's significant pharmaceutical distributors and their related accounts receivable balance as a percentage of total accounts receivable were as follows:

	For the Year Ended December 31,			
	2018		2017	
Customer 1	34	%	34	%
Customer 2	31	%	26	%
Customer 3	21	%	37	%
	86	%	97	%

No other customer represented more than 10% of the Company's accounts receivable balances as of those dates.

The Company is subject to credit risk from its inventory suppliers. The Company sources drug substance from a single supplier and drug product from a single supplier.

Fair Values

The Company’s financial instruments include, cash and cash equivalents, accounts receivable, accounts payable, accrued expenses, warrant liabilities, derivative liability, debt conversion option liability, and debt. Cash is reported at fair value. The recorded carrying amount of accounts receivable, accounts payable and accrued expenses reflect their fair value due to their short-term nature. The carrying value of the interest-bearing debt approximates fair value based upon the borrowing rates currently available to the Company for bank loans with similar terms and maturities. See Note 4 for the fair value measurements.

Inventories

Inventories are stated at the lower of cost or market. The Company calculates inventory valuation adjustments when conditions indicate that market is less than cost due to physical deterioration, usage, obsolescence, reductions in estimated future demand or reduction in selling price. Inventory write-downs are measured as the difference between the cost of inventory and market. The Company reserved $85,000 for Neonorm Foal inventory obsolescence in the year ended December 31, 2018.

Property and Equipment

Equipment is stated at cost, less accumulated depreciation. Equipment begins to be depreciated when it is placed into service. Depreciation is calculated using the straight-line method over the estimated useful lives of 3 to 10 years.

Table of Contents

Expenditures for repairs and maintenance of assets are charged to expense as incurred. Costs of major additions and betterments are capitalized and depreciated on a straight-line basis over their estimated useful lives. Upon retirement or sale, the cost and related accumulated depreciation of assets disposed of are removed from the accounts and any resulting gain or loss is included in the statements of operations and comprehensive loss.

Long-Lived Assets

The Company regularly reviews the carrying value and estimated lives of all of its long-lived assets, including property and equipment to determine whether indicators of impairment may exist that warrant adjustments to carrying values or estimated useful lives. The determinants used for this evaluation include management’s estimate of the asset’s ability to generate positive income from operations and positive cash flow in future periods as well as the strategic significance of the assets to the Company’s business objectives.

Definite-lived intangible assets are amortized on a straight-line basis over the estimated periods benefited, and are reviewed when appropriate for possible impairment.

Goodwill and Indefinite-lived Intangible Assets

Goodwill is tested for impairment on an annual basis and in between annual tests if events or circumstances indicate that an impairment loss may have occurred. The test is based on a comparison of the reporting unit's book value to its estimated fair market value. The Company performs the annual impairment test during the fourth quarter of each fiscal year using the opening consolidated balance sheet as of the first day of the fourth quarter, with any resulting impairment recorded in the fourth quarter of the fiscal year. The Company first recorded goodwill upon the June 2017 Napo Merger, with the goodwill being entirely allocated to the human health reporting unit.

The Company recorded an impairment of goodwill of $16.8 million in the fiscal year ending December 31, 2017. The decline in market capitalization during the three months ended September 30, 2017 was determined to be a triggering event for potential goodwill impairment. Accordingly, the Company performed the goodwill impairment analysis. The Company utilized the market capitalization plus a reasonable control premium in the performance of its impairment test. The market capitalization was based on the outstanding shares and the average market share price for the 30 days prior to September 30, 2017.

The Company recorded an impairment of goodwill of $5.2 million in the fiscal year ending December 31, 2018. The decline in market capitalization during fiscal year 2018 was determined to be a triggering event for potential goodwill impairment. Accordingly, the Company performed the goodwill impairment analysis. The Company utilized the market capitalization plus a reasonable control premium in the performance of its impairment test. The market capitalization was based on the outstanding shares and the average market share price for the 30 days prior to September 30, 2018. The conditions that gave rise to the fiscal year 2018 impairment charge were due to the total of the fair value of total invested capital and non-interest bearing liabilities being less than the book value of total assets.

Fair value determinations require considerable judgment and are sensitive to changes in underlying assumptions, estimates and market factors. Estimating the fair value of individual reporting units and indefinite-lived intangible assets requires the Company to make assumptions and estimates regarding our future plans, as well as industry and economic conditions. These assumptions and estimates include projected revenues and income growth rates, terminal growth rates, competitive and consumer trends, market-based discount rates, and other market factors.

Acquired in-process research and development (IPR&D) are intangible assets initially recognized at fair value and classified as indefinite-lived assets until the successful completion or abandonment of the associated research and development efforts. During the development period, these assets will not be amortized as charges to earnings; instead

these assets will be tested for impairment on an annual basis or more frequently if impairment indicators are identified. The Company recorded an impairment of $2.3 million in the year ended December 31, 2017. The impairment loss was measured based on the excess of the carrying amount over the asset's fair value. The loss resulted from the Company's

Table of Contents

termination of the clostridium dificil infection program. The annual test for impairment determined that there was no impairement loss for the year ended December 31, 2018.

Research and Development Expense

Research and development expense consists of expenses incurred in performing research and development activities including related salaries, clinical trial and related drug and non-drug product costs, contract services and other outside service expenses. Research and development expense is charged to operating expense in the period incurred.

Revenue Recognition

The Company recognizes revenue in accordance with ASC Topic 606, Revenue from Contracts with Customers (“ASC 606”), which was adopted on January 1, 2018, using the modified retrospective method, which was elected to apply to all active contracts as of the adoption date. Application of the modified retrospective method did not impact amounts previously reported by the Company, nor did it require a cumulative effect adjustment upon adoption, as the Company's method of recognizing revenue under ASC 606 yielded similar results to the method utilized immediately prior to adoption. Accordingly, there was no effect to each financial statement line item as a result of applying the new revenue standard.

Practical Expedients, Elections, and Exemptions

The Company recognizes revenue in accordance with the core principle of ASC 606 or when there is a transfer of control of promised goods or services to customers in an amount that reflects the consideration that the Company expects to be entitled to in exchange for those goods or services.

The Company used a practical expedient available under ASC 606 10 65 1(f)4 that permits it to consider the aggregate effect of all contract modifications that occurred before the beginning of the earliest period presented when identifying satisfied and unsatisfied performance obligations, transaction price, and allocating the transaction price to the satisfied and unsatisfied performance obligations.

The Company also used a practical expedient available under ASC 606 10 32 18 that permits it to not adjust the amount of consideration for the effects of a significant financing component if, at contract inception, the expected period between the transfer of promised goods or services and customer payment is one year or less.

The Company has elected to treat shipping and handling activities as fulfillment costs.

Additionally, the Company elected to record revenue net of sales and other similar taxes.

Contracts

Napo entered into a Marketing and Distribution Agreement (“M&D Agreement”) with BexR Logistix, LLC (“BexR” or “Mission Pharmacal” or “Mission”), in April 2016 to appoint BexR as its distributor with the right to market and sell, and the exclusive right to distribute Mytesi (formerly Fulyzaq) in the US. Napo sells Mytesi through Mission, who then sells Mytesi to its distributors and wholesalers — McKesson, Cardinal Health, AmerisourceBergen Drug Corporation (“ABC”), HD Smith, Smith Drug and Publix (together “Distributors”). Mission sells Mytesi to its Distributors, on behalf of Napo, under agreements executed by Mission with these Distributors and Napo abides by the terms and conditions of sales agreed to between Mission and their Distributors. Health care providers order Mytesi through pharmacies who obtain Mytesi through Mission's Distributors. Napo considers Mission as the sales agent and the Distributors of Mission as its customers. Napo retains control of Mytesi held at Mission.

Mission's Distributors are our customers with respect to purchase of Mytesi. The M&D Agreement with Mission, Mission's agreement with the Distributors and the related purchase order will together meet the contract existence criteria under ASC 606 10 25 1. This M&D Agreement with Mission was amended on August 15, 2018, with

Table of Contents

a termination date of January 31, 2019. Effective January 31, 2019, the Company entered into a Distribution Agreement with Cardinal Health to replace Mission as the sales agent.

Jaguar's Neonorm and Botanical extract products are primarily sold to distributors, who then sell the products to the end customers. Since 2014, the Company has entered into several distribution agreements with established distributors such as Animart, Vedco, VPI, RJ Matthews, Henry Schein, and Stockmen Supply to distribute the Company's products in the United States, Japan, and China. The distribution agreements and the related purchase order together meet the contract existence criteria under ASC 606 10 25 1. Jaguar sells directly to its customers without the use of an agent.

Performance obligations

For the products sold by each of Napo and Jaguar, the single performance obligation identified above is the Company's promise to transfer the Company's product Mytesi to Distributors based on specified payment and shipping terms in the arrangement. Product warranties are assurance type warranties that does not represent a performance obligation.

Transaction price

For both Jaguar and Napo, the transaction price is the amount of consideration to which the Company expects to collect in exchange for transferring promised goods or services to a customer. The transaction price of Mytesi and Neonorm is the Wholesaler Acquisition Cost (“WAC”), net of estimated discounts, returns, and price adjustments.

Allocate transaction price

For both Napo and Jaguar, the entire transaction price is allocated to the single performance obligation contained in each contract.

Point in time recognition

For both Napo and Jaguar, a single performance obligation is satisfied at a point in time, upon the free on board (“FOB”) terms of each contract when control, including title and all risks, has transferred to the customer.

Disaggregation of Product Revenue

Human

Sales of Mytesi are recognized as revenue when the products are delivered to the wholesalers. Net revenues from the sale of Mytesi were $4,121,913 and $1,062,919 for the years ended December 31, 2018 and 2017, respectively. The Company did not recognize revenue for Mytesi sales prior to the July 2017 merger with Napo.

Animal

The Company recognized Neonorm revenues of $116,843 and $344,194 for the years ended December 31, 2018 and 2017, respectively. Botanical Extract revenues were zero and $78,000 for the years ended December 31, 2018 and 2017, respectively. Revenues are recognized upon shipment which is when title and control is transferred to the buyer. Sales of Neonorm Calf and Foal to distributors are made under agreements that may provide distributor price adjustments and rights of return under certain circumstances.

Collaboration Revenue

On January 27, 2017, the Company entered into a licensing, development, co-promotion and commercialization agreement with Elanco US Inc. (“Elanco”) to license, develop and commercialize Canalevia, the

Table of Contents

Company's drug product candidate under investigation for treatment of acute and chemotherapy-induced diarrhea in dogs, and other drug product formulations of crofelemer for treatment of gastrointestinal diseases, conditions and symptoms in cats and other companion animals. Under the terms of the agreement, the Company received an initial non-refundable upfront payment of $2,548,689, inclusive of reimbursement of past product and development expenses of $1,048,689, which was recognized as revenue ratably over the estimated development period of one year resulting in revenue of $177,389 and $2,876,071 for the years ended December 31, 2018 and 2017, respectively.

On November 1, 2017, the Company received a letter from Elanco serving as formal notice of their decision to terminate the agreement by giving the Company 90 days written notice. According to the agreement, termination became effective on January 30, 2018.

On September 24, 2018, the Company entered into a Distribution, License and Supply Agreement ("License Agreement") with Knight Therapeutics, Inc. ("Knight"). The License Agreement has a term of 15 years (with automatic renewals) and provides Knight with an exclusive right to commercialize current and future Jaguar human health products (including Crofelemer, Lechlemer, and any product containing a proanthocyanidin or with an anti-secretory mechanism) in Canada and Israel. In addition, Knight was granted a right of first negotiation for expansion to Latin America. Under the License Agreement, Knight is responsible for applying for and obtaining necessary regulatory approvals in the territory of Canada and Israel, as well as marketing, sales and distribution of the licensed products. Knight will pay a transfer price for all licensed products, and upon achievement of certain regulatory and sales milestones, Jaguar may receive payments from Knight in an aggregate amount of up to approximately $18 million payable throughout the initial 15-year term of the agreement. There was no revenue related to these regulatory and sales milestones for the year ended 2018.

Stock-Based Compensation

The Company's 2013 Equity Incentive Plan and 2014 Stock Incentive Plan (see Note 9) provide for the grant of stock options, restricted stock and restricted stock unit awards.

The Company measures stock awards granted to employees and directors at fair value on the date of grant and recognizes the corresponding compensation expense of the awards, net of estimated forfeitures, over the requisite service periods, which correspond to the vesting periods of the awards. The Company issues stock awards with only service-based vesting conditions, and records compensation expense for these awards using the straight-line method.

The Company uses the grant date fair market value of its common stock to value both employee and non-employee options when granted. The Company revalues non-employee options each reporting period using the fair market value of the Company's common stock as of the last day of each reporting period.

Income Taxes

The Company uses the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial reporting and the tax bases of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. A valuation allowance is provided when it is more likely than not that some portion or all of a deferred tax asset will not be realized.

Comprehensive Loss

Comprehensive loss is defined as changes in stockholders’ equity (deficit) exclusive of transactions with owners (such as capital contributions and distributions). For all periods presented, the comprehensive income (loss) was equal to the

net income (loss); therefore, a separate statement of comprehensive income (loss) is not included in the accompanying consolidated financial statements.

Table of Contents

Basic and Diluted Net Loss Per Common Share

Basic net loss per common share is computed by dividing net loss attributable to common stockholders for the period by the weighted-average number of common shares outstanding during the period. Diluted net loss per share is computed by dividing the net loss attributable to common stockholders for the period by the weighted-average number of common shares, including potential dilutive shares of common stock assuming the dilutive effect of potential dilutive securities. For periods in which the Company reports a net loss, diluted net loss per common share is the same as basic net loss per common share, because their impact would be anti-dilutive to the calculation of net loss per common share. Diluted net loss per common share is the same as basic net loss per common share for the years ended December 31, 2018 and 2017.

Recent Accounting Pronouncements

In November 2018, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update 2018-18: Clarifying the Interaction between Topic 808 and Topic 606 (ASU 2018-18). The guidance clarifies that certain transactions between collaborative arrangement participants should be accounted for as revenue under ASC 606 when the collaborative arrangement participant is a customer for a promised good or service that is distinct within the collaborative arrangement. The guidance also precludes entities from presenting amounts related to transactions with a collaborative arrangement participant that is not a customer as revenue, unless those transactions are directly related to third-party sales. ASU 2018-18 is effective in the first quarter of 2020 and should be applied retrospectively to January 1, 2018, when we adopted ASC 606. Early adoption is permitted. The Company is evaluating the effect of adoption, but we do not expect a material effect on our revenue

In February 2016, the FASB isssued ASU 2016-02, Leases (Topic 842). ASU 2016-02 requires lessees to recognize right-of−use assets and lease liabilities for most leases on the balance sheet and to provide expanded disclosures about leasing arrangemcnts. ASU 2016-02 is effective for fiscal years beginning after December 15, 2018 with early adoption pcrmitted. The Company will adopt this guidance cffective January 1, 2019 using the optional transition method and will not restate comparative periods. The Company's is still evaluating the impact of the adoption of this standard.

In June 2018, the FASB issued ASU 2018-07, Compensation - Stock Compensation (Topic 718), Improvements to Non employee Share-Based Payment Accounting, which aligned certain aspects of share-based payments accounting between employees and nonemployees. Specifically, nonemployee share-based payment awards within the scope of Topic 718 are measured at grant-date fair value of the equity instruments that an entity is obligated to issue when the good has been delivered or the service has been rendered and any other conditions necessary to earn the right to benefit from the instruments have been satisfied and an entity considers the probability of satisfying performance conditions when nonemployee share-based payment awards contain such conditions. ASU 2018-07 is effective for the Company beginning in the first quarter of 2019. The new standard will not have a significant impact on the Company's financial statement or disclosures.

3. Business Combination

The Company completed a merger with Napo on July 31, 2017. Napo now operates as a wholly-owned subsidiary of Jaguar focused on human health and the ongoing commercialization of Mytesi, a Napo drug product approved by the U.S. FDA for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy.

Table of Contents

The merger was accounted for under the acquisition method of accounting for business combinations and Jaguar was considered to be the acquiring company. Under the acquisition method of accounting, total consideration exchanged was:

Fair value of Jaguar common stock	$ 25,303,859
Fair value of Jaguar common stock warrants	630,859
Fair value of replacement restricted stock units	3,300,555
Fair value of replacement stock options	5,691
Cash	2,000,000
Effective settlement of receivable from Napo	464,295
Total consideration exchanged	$ 31,705,259

The purchase price allocation to assets and liabilities assumed in the transaction was:

Current assets	$ 2,578,114
Non-current assets	396,247
Identifiable intangible assets	36,400,000
Current liabilities	(4,052,180)
Convertible notes payable	(12,473,501)
Deferred tax liability	(13,181,242)
Net assets acquired	9,667,438
Goodwill on acquisition	22,037,821
Total consideration	$ 31,705,259

Under the acquisition method of accounting, certain identifiable assets and liabilities of Napo including identifiable intangible assets, inventory, debt and deferred revenue were recorded based on their estimated fair values as of the effective time of the Napo Merger. Tangible and other assets and liabilities were valued at their respective carrying amounts, which management believes approximate their fair values.

Acquired intangible assets included Developed Technology (“DT”) related to the development and commercial processing of Mytesi™ (crofelemer 125mg delayed-release tablets), which is an antidiarrheal indicated for the symptomatic relief of noninfectious diarrhea in adult patients with HIV/AIDS on antiretroviral therapy. The DT is a definite lived asset and is being amortized over a 15 year estimated useful life.

The acquired trademarks include Mytesi product trademark, domain names, and other brand related intellectual property. Trademark is a definite lived asset and is being amortized over a 15-year estimated useful life.

The acquired IPR&D projects relate to developing the proprietary technology into a commercially viable product for the several follow-on indications related to formulations of crofelemer. Crofelemer is in development for rare disease indications for infants and children with congenital diarrheal disorders (CDD) and short bowel syndrome (SBS), and for irritable bowel syndrome (IBS). These indications have completed some studies of clinical testing for safety

and/or proof of concept efficacy at the time of the merger and the projects were determined to have substance. IPR&D is not amortized during the development period and is tested for impairment at least annually, or more frequently if indicators of impairment are identified. The Company terminated development of the indication for C. difficile infection (CDI) in the quarter ended December 31, 2017. This indication was included as part of IPR&D at the time of the merger, and an impairment loss of $2,300,000 was recorded in fiscal year 2017 as a result of the decision to abandon the project in favor of the prioritization of the following: Mytesi is in development for follow-on indications in cancer therapy-related diarrhea (CTD), an important supportive care indication for patients undergoing primary or adjuvant therapy for cancer treatment; as supportive care for post-surgical inflammatory bowel disease patients (IBD); and as a second-generation anti-secretory agent for use in cholera patients. These indications did not have substance at the time of the merger and were not recognized as an asset apart from Goodwill.

Table of Contents

The fair value of IPR&D, trademark, and DT was determined using the income approach, which was based on forecasts prepared by management.

The Napo Merger resulted in $22,037,821 of goodwill relating principally to synergies expected to be achieved from the combined operations and planned growth in new markets. Goodwill has been allocated to the human health segment.

As none of the goodwill, IPR&D, and developed technology acquired are expected to be deductible for income tax purposes, it was determined that a deferred income tax liability of $14,498,120 was required to reflect the book to tax differences of the merger. A deferred tax asset of $1,316,878 was accounted as an element of consideration for the replacement share-based payment awards as the replacement awards are expected to result in a future tax deduction.

The Company valued convertible debt assumed in the Napo Merger based on the value of the debt and the conversion option at $12,473,501 (see note 8). The Company incurred acquisition related costs of $3,554,250 during the year ended December 31, 2017. The acquisition related costs for the year ended December 31, 2017 includes the fair value of $151,351 for 270,270 shares of Company's common stock issued to a former creditor of Napo towards reimbursement of acquisition related costs. Acquisition related costs are expensed as incurred to general and administrative expenses in the condensed consolidated statements of operations and comprehensive loss.

In September 2018, the Company received a $1.2 million payment from Valeant, in a settlement agreement with Glenmark Pharmaceuticals, Valeant Pharmaceuticals Ireland, Limited, and Salix Pharmaceuticals, related to inventory that was in negotiations of title on July 31, 2017, the date of the merger with Napo. Accordingly, this was the settlement of a contingency acquired in the July 2017 Napo merger. The Company recorded the one-time settlement outside of operations as it was related to the July 2017 Napo merger. The $1.2 million gain on the Valeant settlement in fiscal year 2018 is recorded in the consolidated statements of operations.

Unaudited Proforma Information

The following table provides unaudited proforma results, prepared in accordance with ASC 805, for the year ended December 31, 2017, as if Napo had been acquired on January 1, 2016.

	For the year ended December 31, 2017
Net sales	$ 5,436,263
Net loss	$ (23,113,148)
Net income (loss) per share, basic and diluted	$ (0.53)

The unaudited proforma results include adjustments to eliminate the interest on Napo's historical convertible debt not assumed by Jaguar and debt exchanged for Jaguar common stock, record interest on convertible debt assumed by Jaguar, eliminate Napo impairment of investment in related party, and eliminate Napo's loss from investment in related party. The Company made proforma adjustments to exclude the acquisition related costs for the year ended December 31, 2017 and to exclude the acquisition related costs in the results for the year ended December 31, 2016, because such costs are nonrecurring and are directly related to the Napo Merger.

The unaudited pro forma condensed results do not give effect to the potential impact of current financial conditions, regulatory matters, operating efficiencies or other savings or expenses that may be associated with the Napo Merger. The Company made proforma adjustments to exclude the acquisition related costs for the years ended December 31, 2017 and 2016.

Unaudited pro forma amounts are not necessarily indicative of future results.

Table of Contents

4. Fair Value Measurements

ASC 820 "Fair Value Measurements," defines fair value, establishes a framework for measuring fair value under generally accepted accounting principles and enhances disclosures about fair value measurements. Fair value is defined under ASC 820 as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value under ASC 820 must maximize the use of observable inputs and minimize the use of unobservable inputs. The standard describes a fair value hierarchy based on three levels of inputs, of which the first two are considered observable and the last unobservable, that may be used to measure fair value which are the following:

- Level 1—Observable inputs such as quoted prices (unadjusted) for identical instruments in active markets.
- Level 2—Observable inputs such as quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, or model derived valuations whose significant inputs are observable.
- Level 3—Unobservable inputs that reflect the reporting entity's own assumptions.

The following tables set forth the fair value of the Company's consolidated financial instruments that were measured at fair value on a recurring basis as of December 31, 2018 and 2017:

	December 31, 2018			
	Level 1	Level 2	Level 3	Total
Warrant liability	$ —	$ —	$ 220,376	$ 220,376
Derivative liability	—	—	—	—
Conversion option liability	—	—	—	—
Total fair value	$ —	$ —	$ 220,376	$ 220,376

	December 31, 2017			
	Level 1	Level 2	Level 3	Total
Warrant liability	$ —	$ —	$ 103,860	$ 103,860
Derivative liability	—	—	11,000	11,000
Conversion option liability	—	—	111,841	111,841
Total fair value	$ —	$ —	$ 226,701	$ 226,701

The change in the estimated fair value of Level 3 liabilities is summarized below:

	For the year ended December 31, 2018		
	Warrant Liability	Derivative Liability	Conversion Option Liability
Beginning value of Level 3 liability	$ 103,860	$ 11,000	$ 111,841

Additions	611,286	—	—
Extinguishment	—	—	(286,595)
Change in fair value	(494,770)	(11,000)	174,754
Ending fair value of Level 3 liability	$ 220,376	$ —	$ —

Warrant Liability

The warrants associated with the Level 3 warrant liability were the November 2016 Series A Warrants and the October 2018 Underwriter Warrants, which at December 31, 2018 were valued at $7,388 and $212,988, respectively in the Company's consolidated balance sheet.

Table of Contents

The Series A warrant valuation of $103,860 at December 31, 2017 was computed using the Black-Scholes-Merton pricing model using a stock price of $0.14, a strike price of $11.25 per share, an expected term of 4.41 years, volatility of 96.36% and a risk-free discount rate of 2.14%. The Series A warrant valuation of $7,388 at December 31, 2018 was computed using the Black-Scholes-Merton pricing model using a stock price of $0.23, a strike price of $11.25 per share, an expected term of 3.41 years, volatility of 135.63% and a risk-free discount rate of 2.46%. The net change in the fair value of the warrants of $96,472 for the year-ended December 31, 2018 is recorded in the change in fair value of warrants, derivative liability and conversion option liability in the consolidated statements of operations

The October 2018 Underwriter Warrants valuation of $611,286 issued in October 2018 was computed using the Black-Scholes-Merton pricing model using a stock price of $0.59, a strike price of $0.75 per share, an expected term of 5.0 years, volatility of 137.87% and a risk-free discount rate of 2.51%. The October 2018 Underwriter Warrants valuation of $212,988 at December 31, 2018 was computed using the Black-Scholes-Merton pricing model using a stock price of $0.23, a strike price of $0.75 per share, an expected term of 4.76 years, volatility of 135.63% and a risk-free discount rate of 2.51%. The net change in the fair value of the warrants of $398,298 for the year-ended December 31, 2018 is recorded in the change in fair value of warrants, derivative liability and conversion option liability in the consolidated statements of operations

Derivative Liability

The derivative liability associated with the Level 3 liability was associated with the June 2017 issuance of a convertible note payable (see Note 8). The Company computed fair values at the date of issuance of $15,000 and $5,000 for the repayment and the interest rate increase feature, respectively, using the Binomial Lattice Model, which was based on the generalized binomial option pricing formula. The derivatives were revalued again at September 30, 2018 using the same Model resulting in a combined minimal fair value. The resulting $11,000 gain for the year-ended December 31, 2018 is recorded in the change in fair value of warrants, derivative liability and conversion option liability in the consolidated statements of operations

Conversion Option Liability

In March 2017, Napo entered into an exchangeable note purchase agreement with two lenders for the funding of face amount of $1,312,500 in two $525,000 tranches of face amount $656,250. The Company assumed the notes at fair value of $1,312,500 as part of the Napo Merger. In December 2017, Napo amended the exchangeable note purchase agreement to extend the maturity of the first tranche and second tranche of notes to February 15, 2018 and April 1, 2018, respectively, increase the principal amount by 12%, and reduce the conversion price from $0.56 per share to $0.20 per share. The Company also issued 166,139 shares of common stock to the lenders in connection with this amendment to partially redeem $299,050 from the first tranche of the notes. The optional conversion option in the notes was bifurcated and accounted as a derivative liability at its fair value of $111,841 using the Black-Scholes-Merton model and the following criteria: stock price of $0.14 per share, conversion prices of $0.20 per share, expected life of 0.13 to 0.25 years, volatility of 86.29% to 160.78%, risk free rate of 1.28% to 1.39% and dividend rate of 0%. The $111,841 was included in conversion option liability on the balance sheet and in loss on extinguishment of debt on the statements of operations. The fair value of the conversion option liability was again revalued at March 23, 2018 using the Black-Scholes-Merton model using the following criteria: stock price of $0.21 per share, expected life of 0.11 years, volatility of 288.16%, risk free rate of 1.69% and dividend rate of 0%, resulting in an increase of $174,754 to the fair value of the conversion option liability. The underlying debt was paid off in March of 2018 and the $286,595 conversion option liability was written off to other income, net in the statements of operations.

104

Table of Contents

5. Related Party Transactions

Management Services Agreement

In March 2018, concurrent with the issuance of the Company's Series A convertible participating preferred stock to Sagard Capital Partners, the Company entered into a Management Services Agreement with Sagard Capital Partners. Under the agreement, Sagard Partners will provide consulting and management advisory service to the Company from March 2018 through March 2021. These services include assistance with strategic planning regarding the Company's commercial strategy, research and due diligence regarding human resource activities, and strategic advice in financial matters. In consideration for such services, the Company will pay Sagard Capital Partners an annual fee of $450,000, with total fees over the term of the agreement not to exceed $1,350,000.

Letter of Credit

To satisfy the letter of credit requirement in the Company's new office lease agreement, Pacific Capital Management, LLC, one of the Company's existing shareholders, caused its financial institution to issue a letter of credit in the amount of $475,000 on behalf of the Company, dated August 28, 2018. In consideration of the letter of credit, in August 2018 the Company issued to Capital Management, LLC a warrant to purchase 670,586 shares of the Company's voting common stock. The warrant is exercisable on or after March 28, 2019 at an exercise price of $0.70 per common share and has a five year term. The $493,688 fair value of the Warrant was classified in the statement of stockholders equity (see Note 7).

Corporate Officers' Family Members

On September 11, 2018, the Company issued a Convertible Promissory Note to Dr. A. Conte, who is the brother of the CEO, Lisa Conte, for cash proceeds of $100,000, representing a principal amount of $111,250 less a discount of $11,250. These terms were substantially the same as those negotiated with a third party. In October 2018 the Company paid off the entire note. As an inducement to enter into the respective Note Purchase Agreement, Dr. Conte received a five- year Warrant to purchase 33,918 shares of Common Stock (Investor Warrant). The exercise price for the Investor Warrant is $1.23 per share. The transaction was filed in a Form 8-K with the SEC on September 12, 2018.

6. Balance Sheet Components

Land, Property and Equipment

Land, property and equipment at December 31, 2018 and 2017 consisted of the following:

	December 31, 2018	December 31, 2017

Land	$ 396,247	$ 396,247
Lab equipment	410,522	811,087
Clinical equipment	64,870	64,870
Software	62,637	62,637
Total property and equipment at cost	934,276	1,334,841
Accumulated depreciation	(173,659)	(112,773)
Property and equipment, net	$ 760,617	$ 1,222,068

Table of Contents

During fiscal year 2018, certain lab equipment in the amount of $407,092 was reclassified to other assets to more properly reflect the asset purpose. Depreciation and amortization expense was $60,886 and $60,124 in the years ended December 31, 2018 and 2017, respectively.

Goodwill

The change in the carrying amount of goodwill for the year ended December 31, 2018 and 2017 was as follows:

	December 31, 2018	December 31, 2017
Beginning balance	$ 5,210,821	$ —
Goodwill acquired in conjunction with the Napo merger	—	22,037,821
Impairment	(5,210,821)	(16,827,000)
Ending balance	$ —	$ 5,210,821

Goodwill represents the excess of the purchase price over the fair value of the net tangible and intangible assets acquired. Concurrent with the Napo Merger in July 2017, the Company recorded goodwill of $22.0 million, which was allocated to the Human Health segment. The Company believes this goodwill consists principally of expected synergies to be realized by combining capabilities, technology, and data. In accordance with ASC 350, goodwill will not be amortized but will be tested for impairment at least annually. Goodwill created as a result of the acquisition is not deductible for tax purposes. At December 31, 2017, the Company determined that goodwill was impaired and recorded an impairment loss of $16.8 million in the consolidated statement of operations. At December 31, 2018 the Company determined that the entire remaining balance of goodwill was impaired and recorded an impairment loss of $5.2 million in the consolidated statement of operations.

Intangible assets, net

Intangible assets, net of amortization at December 31, 2018 and 2017 consist of the following:

	December 31, 2018	December 31, 2017
Developed technology	$ 25,000,000	$ 25,000,000
Accumulated developed technology amortization	(2,361,111)	(694,445)
Developed technology, net	22,638,889	24,305,555
In process research and development	8,800,000	11,100,000
Impairment	—	(2,300,000)
In process research and development, net	8,800,000	8,800,000
Trademarks	300,000	300,000
Accumulated trademark amortization	(28,333)	(8,333)
Trademarks, net	271,667	291,667
Total intangible assets, net	$ 31,710,556	$ 33,397,222

At December 31, 2017, the Company determined that In process research and development was impaired and recorded an impairment loss of $2.3 million in the consolidated statement of operations. At December 31, 2018, the Company determined that none of its intangible assets were impaired.

Amortizable intangible assets include Developed technology and Trademarks. Intangible assets subject to amortization are amortized using the straight-line method over their estimated useful lives of fifteen years. Amortization

Table of Contents

expense of finite-lived intangibles was $1,686,657 and $702,778 for the years ended December 31, 2018 and 2017, respectively.

The following table summarizes the Company's estimated future amortization expense of intangible assets with finite lives as of December 31, 2018:

	Amounts
2019	$ 1,686,667
2020	$ 1,686,667
2021	$ 1,686,667
2022	$ 1,686,667
2023	$ 1,686,667
Thereafter	14,477,222
	$ 22,910,557

Accrued Liabilities

Accrued liabilities at December 31, 2018 and 2017 consist of the following:

	December 31, 2018	December 31, 2017
Accrued vacation	$ 287,326	$ 264,304
Accrued payroll	300,040	150
Accrued payroll tax	57,306	30,617
Accrued interest	917,482	659,961
Accrued consulting	660,370	1,785
Accrued research and development costs	106,607	668,850
Accrued legal costs	439,682	—
Accrued audit and tax services	96,150	40,000
Deferred rent	—	4,584
Accrued other	2,074,478	533,882
Total	$ 4,939,441	$ 2,204,133

7. Commitments and Contingencies

Beginning in July 2015, the Company leased its San Francisco, California headquarters under a non-cancellable sub-lease agreement that expired on August 31, 2018.

On August 28, 2018, the Company entered into an office lease extension agreement for its office space in San Francisco, CA. The term of the Lease began on September 1, 2018 and will expire on September 30, 2020, unless

earlier terminated in accordance therewith. The monthly base rent under the Lease is as follows: $38,392 for the first twelve months, $39,544 for the subsequent twelve months, and $40,730 for the final month. The Company will also pay an additional monthly amount for the Company's proportionate share of the building's operating charges. An existing shareholder provided a standby letter of credit in the amount of $475,000 to the Lessor as collateral for the full performance by the Company of all of its obligations under the Lease. In consideration of the Letter of Credit, the Company issued the existing shareholder a five-year warrant to purchase 670,586 shares of the Company's voting common stock (see Note 8). The Warrant is exercisable on or after March 28, 2019 at an exercise price of $0.70 per share. The fair value of the warrant was determined to be $493,689 using the Black-Scholes-Merton model with the following criteria: stock price of $0.84 per share, expected life of 5 years, volatility of 132%, risk-free rate of 2.77% and dividend rate of 0%. The $493,688 fair value of the Warrant was classified in the statement of stockholders equity with an offset to deferred rent. Each month, $19,748 of this deferred rent will be recognized as non-cash rent expense.

Table of Contents

Future minimum noncancelable lease payments under operating leases as of December 31, 2018 are as follows:

Years ending December 31,	Facilities
2019	465,310
2020	$ 357,079
Total minimum lease payments	$ 822,389

The Company recognizes rent expense on a straight-line basis over the noncancelable lease period. Rent expense was $475,305 and $361,114 for the years ended December 31, 2018 and 2017, respectively. Rent expense is included in general and administrative expense in the consolidated statements of operations.

Asset transfer and transition commitment

On September 25, 2017, Napo entered into the Termination, Asset Transfer and Transition Agreement dated September 22, 2017 with Glenmark Pharmaceuticals Ltd. (“Glenmark”). As a result of the agreement, Napo now holds extensive global rights for Mytesi, and also holds commercial rights to the existing regulatory approvals for crofelemer in Brazil, Ecuador, Zimbabwe and Botswana. In exchange, Napo is obligated to pay Glenmark 25% of any payment it receives from a third party to whom Napo grants a license or sublicense or with whom Napo partners in respect of, or sells or otherwise transfers any of the transferred assets, subject to certain exclusions, until Glenmark has received a total of $7 million. As of December 31, 2018, Napo has made no payments to Glenmark under the agreement.

Revenue sharing commitment

On December 14, 2017, the Company announced its entry into a collaboration agreement with Seed Mena Businessmen Services LLC (“SEED”) for Equilevia, the Company’s non-prescription, personalized, premium product for total gut health in equine athletes. According to the terms of the Agreement, the Company will pay SEED 15% of total revenue generated from any clients or partners introduced to the Company by SEED in the form of fees, commissions, payments or revenue received by the Company or its business associates or partners, and the agreed-upon revenue percentage increases to 20% after the first million dollars of revenue. In return, SEED will provide the Company access to its existing UAE network and contacts and assist the Company with any legal or financial requirements. The agreement became effective on December 13, 2017 and will continue indefinitely until terminated by either party pursuant to the terms of the Agreement. Upon termination for any reason, the Company remains obligated to make Revenue Sharing Payments to SEED until the end of 2018. As of December 31, 2018, the Company has made no payments to SEED under the agreement and the agreement is still in place.

Purchase Commitment

As of December 31, 2018, the Company had issued non-cancellable purchase orders to a vendor for $1.5 million.

Legal Proceedings

March 2018 Demand Letter relating to 2018 Special Meeting of Stockholders

While not a legal proceeding, on March 27, 2018, we received a demand letter from a law firm representing a purported stockholder, relating to certain approvals obtained at a special meeting of stockholders on March 12, 2018 (the "2018 Special Meeting"). The demand letter alleges that we miscalculated the votes with respect to (i) the proposal to amend our Third Amended and Restated Certificate of Incorporation as filed with Secretary of State of the State of Delaware on March 15, 2018 (the "COI"), which increased the authorized shares of Common Stock from 250,000,000 to 500,000,000 (the "Share Increase Proposal") and (ii) the proposal to amend the COI to effect a reverse stock split at a ratio of not less than 1 for 1.2 and not greater than 1 for 10 (the "Former Reverse Stock Split Proposal").We did not implement the Former Reverse Stock Split Proposal. In addition, at the 2018 annual meeting of stockholders held on May 18, 2018, stockholders approved amendments to the COI to (i) effect a reverse stock split at a ratio of not less than

Table of Contents

1 for 11 and not greater than 1 for 15 and (ii) decrease the number of authorized shares of Common Stock to 150,000,000.

On September 5, 2018, we responded to the law firm, indicating that the Board unanimously rejected the demands set forth in the demand letter (the "Demand Letter Claims"). While no proceedings with respect to the demand letter were ever initiated, we believe that the allegations set forth in the demand letter were without merit and we would have vigorously defended against any such proceeding. The Demand Letter Claims were settled with a release of all such claims in March 2019 without any material financial settlement costs incurred by us.

July 2017 Complaint Relating to the Merger

On July 20, 2017, a putative class action complaint was filed in the United States District Court, Northern District of California, Civil Action No. 3:17 cv 04102, by Tony Plant (the "Plaintiff") on behalf of shareholders of the Company who held shares on September 30, 2017 and were entitled to vote at the 2017 Special Shareholders Meeting, against the Company and certain individuals who were directors as of the date of the vote (collectively, the "Defendants"), in a matter captioned Tony Plant v. Jaguar Animal Health, Inc., et al., making claims arising under Section 14(a) and Section 20(a) of the Exchange Act and Rule 14a 9, 17 C.F.R. § 240.14a 9, promulgated thereunder by the SEC. The claims alleged false and misleading information provided to investors in the Joint Proxy Statement/Prospectus on Form S 4 (File No. 333 217364) declared effective by the SEC on July 6, 2017 related to the solicitation of votes from shareholders to approve the merger and certain transactions related thereto. We accepted service of the complaint and summons on behalf of itself and the United States based director Defendants on November 1, 2017. We have not accepted service on behalf of, and Plaintiff has not yet served, the non U.S. based director Defendants.

On October 3, 2017, Plaintiff filed a motion seeking appointment as lead plaintiff and appointment of Monteverde & Associates PC as lead counsel. That motion was granted. Plaintiff filed an amended complaint against the Company and the United States based director Defendants on January 10, 2018. The Defendants filed a motion to dismiss on March 12, 2018, for which oral arguments were held on June 14, 2018. The court dismissed the complaint on September 20, 2018. Plaintiff was entitled to amend the complaint within 20 days from the date of dismissal. On October 10, 2018, Plaintiff amended the complaint to focus on our commercial strategy in support of Equilevia and the related disclosure statements in the Form S 4 described above. On November 6, 2018, the Defendants moved to dismiss the second amended complaint. The Defendants argue in their motion that the complaint fails to state a claim upon which relief can be granted because the omissions and misrepresentations alleged in the complaint are immaterial as a matter of law. The court has elected to rule on Defendants' motion to dismiss without holding oral arguments. If the Plaintiff were able to prove its allegations in this matter and to establish the damages it asserts, then an adverse ruling could have a material impact on us. We believe that it is not probable that an asset has been impaired or a liability has been incurred as of the date of the financial statements and the amount of any potential loss is not reasonably estimable.

Other than as described above, there are currently no claims or actions pending against us, the ultimate disposition of which could have a material adverse effect on our results of operations, financial condition or cash flows.

Contingencies

From time to time, the Company may be involved in legal proceedings (other than those noted above) arising in the ordinary course of business. The Company believes there is no litigation pending that could have, individually or in the aggregate, a material adverse effect on the financial position, results of operations or cash flows.

109

Table of Contents

8. Debt and Warrants

Convertible Debt and Warrants

Convertible debt at December 31, 2018 and December 31, 2017 consist of the following:

	December 31, 2018	December 31, 2017
February 2015 convertible debt	—	150,000
June 2017 convertible debt	740,882	1,613,089
Napo convertible debt	10,553,888	12,153,389
	$ 11,294,770	$ 13,916,478
Less: unamortized debt discount and debt issuance costs	(55,600)	(261,826)
Net convertible debt obligation	$ 11,239,170	$ 13,654,652
Convertible debt - non-current, net of discount	—	10,982,437
Convertible debt - current, net of discount	$ 11,239,170	$ 2,672,215

Interest expense on the convertible debt was $934,214 and $634,276 for the years ended December 31, 2018 and 2017.

February 2015 Convertible Debt

In February 2015, the Company issued a convertible promissory note to an accredited investor in the aggregate principle amount of $150,000. This note was issued pursuant to the convertible note purchase agreement dated December 23, 2014. In March of 2018, the debtor agreed to accept 135,605 shares of the Company’s common stock as payment for all outstanding principal and interest in the amount of $203,408.

June 2017 Convertible Debt

On June 29, 2017, the Company issued a secured convertible promissory note to Chicago Venture Partners, L.P.(“CVP”) in the aggregate principal amount of $2,155,000 less an original issue discount of $425,000 and less $30,000 to cover the lender's legal fees for net cash proceeds of $1,700,000. Interest on the outstanding balance will be paid 8% per annum from the purchase price date until the balance is paid in full.

The Note provides for two separate features that result in a derivative liability:

1. Repayment of mandatory default amount upon an event of default-upon the occurrence of any event of default, the lendor may accelerate the Note resulting in the outstanding balance becoming immediately due and payable in cash; and
2. Automatic increase in the interest rate on and during an event of default-during an event of default, the interest rate will increase to the lesser of 17% per annum or the maximum rate permitted under applicable law.

The Company computed fair values at the date of issuance of $15,000 and $5,000 for the repayment and the interest rate increase feature, respectively, using the Binomial Lattice Model, which was based on the generalized binomial option pricing formula. The $20,000 combined fair value was carved out and is included as a derivative liability on the Balance Sheet. The derivatives were revalued at December 31, 2017 using the same Model resulting in a combined

fair value of $11,000. The derivatives were revalued again at September 30, 2018 using the same Model resulting in a de minimus fair value. The resulting $11,000 gain is included in other income and expense in the Company's consolidated statements of operations.

Table of Contents

On August 2, 2018, the Company and CVP agreed to an amendment extending the maturity date to August 26, 2019, and limiting the aggregate amount that CVP is permitted to redeem on a monthly basis to $500,000, which is the maximum aggregate redemption amount for all notes outstanding with CVP. This amendment resulted in the Company accounting for the transaction as a troubled debt restructuring, under which the carrying amount of the note payable remained unchanged but interest expense is computed using a new effective rate that equates the present value of the future cash payments specified by the new terms with the carrying amount of the note.

Between October 2018 and December 2018, the Company and CVP renegotiated the terms of the June 2017 Note agreement such that CVP agreed not to make any redemptions of the Note until March 2019. In consideration of this standstill arrangement, the Company paid CVP a total standstill fee of $499,403 for all four CVP Notes. The standstill fee allocated to the June 2017 Note was $63,296, of which $37,296 increased the principle balance and $26,000 was paid in cash. These restructurings in whole represented four separate restructurings of the June 2017 Convertible Note agreement, resulting in two troubled debt restructurings accounted for under ASC 470-60 and two modifications accounted for under ASC 470-50. For the two modifications resulting in troubled debt restructurings, the changes were accounted for prospectively and a new effective interest rate was determined that equated the present value of the future cash payments specified by the new terms with the carrying amount of the Note. For the two modifications that resulted in modification accounting, a new effective rate was determined at the date of modification that equated the revised cash flows to the carrying amount of the Note.

The balance of the June 2017 convertible debt as of December 31, 2018 of $685,282 consists of the $740,882 face value of the note less note discounts of $55,600, and is included in convertible debt in the current liabilities section of the consolidated balance sheet.

September 2018 L2 Promissory Note and Warrants

On September 11, 2018 the Company entered into a Note Purchase Agreement with L2 Capital, pursuant to which the Company issued to L2 Capital a contingently convertible promissory note in the aggregate principal amount of $455,000. Net cash proceeds were $400,000, or $455,000 of principal net a discount of $55,000. The Notes bear interest at the rate of 8% per annum and mature on March 11, 2019. On October 10, 2018, the Company paid off the entire $455,000 principle balance of the Note, including the guaranteed interest and an early-redemption premium, resulting in an extinguishment loss of $190,441.

Concurrent to entering into the Note Purchase Agreement, the Company issued to L2 Capital 75,000 shares of common stock and a 5-year warrant to purchase 185,417 shares of common stock. The 75,000 shares of common stock had a fair value of $48,000. The warrants had a fair value of $100,330 as estimated using the Black Scholes option pricing model. The assumptions used in the Black Scholes model included a common stock trading price of $0.64, an exercise price of $0.90 per share, a term of five years, a discount rate of 2.9% and volatility of 132%. The warrants were recorded in additional paid-in-capital and treated as a discount to the note balance.

September 2018 Conte Promissory Note and Warrants

On September 11, 2018 the Company entered into a Note Purchase Agreement with an accredited investor pursuant to which the Company issued to the accredited investor a convertible promissory note in the aggregate principal amount of $111,250. Net cash proceeds received were $100,000, or $111,250 of principal less a discount of $11,250. The Notes bear interest at the rate of 8% per annum and matures on March 11, 2019. On October 10, 2018, the Company paid off the entire $111,250 principle balance of the Note, including the guaranteed interest and an early - redemption premium, resulting in an extinguishment loss of $27,883.

Concurrent to entering into the Note Purchase Agreement, the Company provided to the accredited investor a five-year warrant to purchase 33,918 shares of common stock, for a fair value of $17,819. The estimated value of the warrants was determined by using the Black Scholes option pricing model. The assumptions used included a common stock trading price of $0.64, an exercise price of $1.23 per share, a term of five years, a discount rate of 2.9% and volatility of 132%. The warrants were recorded in additional paid-in-capital and treated as a discount to the note balance.

Table of Contents

Napo convertible debt

March 2017 Convertible Debt

In March 2017, Napo entered into an exchangeable Note Purchase Agreement with two lenders for the funding of face amount of $1,312,500 in two $525,000 tranches of face amount $656,250. The notes bear interest at 3% and mature on December 1, 2017. The Company assumed the notes at fair value of $1,312,500 as part of the Napo Merger.

First Amendment to Note Purchase Agreement and Notes

In December 2017, Napo amended the exchangeable note purchase agreement to extend the maturity of the first tranche and second tranche of notes to February 15, 2018 and April 1, 2018, respectively, increase the principal amount by 12%, and reduce the conversion price from $0.56 per share to $0.20 per share. The Company also issued 166,139 shares of common stock to the lenders in connection with this amendment to partially redeem $299,050 from the first tranche of the notes. The amended face value of the notes was $1,170,950. This amendment resulted in the Company treating the notes as having been extinguished and replaced with new notes for accounting purposes due to meeting the 10% cash flow test. The conversion option in the notes was bifurcated and accounted for as a conversion option liability at its fair value as further disclosed in Note 4.

Second Amendment to Note Purchase Agreement and Notes

On February 16, 2018, Napo amended the exchangeable note purchase agreement to extend the maturity date of the Second Tranche Notes from April 1, 2018 to May 1, 2018. In addition, the Company also issued 252,230 shares of Common Stock to the Purchasers as repayment of the remaining $435,950 aggregate principal amount and $18,063 in accrued and unpaid interest thereon. On March 23, 2018, the Company paid off the remaining $735,000 of principal and $20,699 in interest due on the second tranche debt in cash with proceeds from the March 23, 2018 equity financing. The fair value of the conversion option liability was again revalued at March 23, 2018 using the Black-Scholes-Merton model using the following criteria: stock price of $0.21 per share, expected life of 0.11 years, volatility of 288.16%, risk free rate of 1.69% and dividend rate of 0%, resulting in an increase of $174,754 to the fair value of the conversion option liability and included in the change in fair value of warrants and conversion option liability in the statements of operations. The underlying debt was paid off in March of 2018 and the $286,595 conversion option liability was written off to other income in the statements of operations.

December 2016 Convertible Debt

In December 2016, Napo entered into a note purchase agreement which provided for the sale of up to $12,500,000 face amount of notes and issued convertible promissory notes (the Napo December 2016 Notes) in the aggregate face amount of $2,500,000 to three lenders and received proceeds of $2,000,000 which resulted in $500,000 of original issue discount. In July 2017, Napo issued convertible promissory notes (the Napo July 2017 Notes) in the aggregate face amount of $7,500,000 to four lenders and received proceeds of $6,000,000 which resulted in $1,500,000 of original issue discount. The Napo December 2016 Notes and the Napo July 2017 Notes mature on December 30, 2019 and bear interest at 10% with interest due each six-month period after December 30, 2016. On June 30, 2017, the accrued interest of $125,338 was added to principal of the Napo December Notes, and the new principal balance became $2,625,338. Interest may be paid in cash or in the stock of Jaguar per terms of the note purchase agreement. In each one year period beginning December 30, 2016, up to one-third of the principal and accrued interest on the notes may be converted into the common stock of the merged entity at a conversion price of $0.925 per share. The Company assumed these convertible notes at fair value of $11,161,000 as part of the Napo Merger. The $1,035,661 difference between the fair value of the notes and the principal balance is being amortized over the twenty-nine (29) month period from July 31, 2017 to December 31, 2019 or $178,562 and is recorded as a contra interest expense in the

consolidated statements of operations. Interest expense is paid every nine months through the issuance of common stock. On March 16, 2018, $534,775 of interest accrued through January 31, 2018 and $169,950 of certain legal expenses were paid through the issuance of 285,694 shares of the Company's common stock. In August 2018, the Company paid $479,808 of accrued interest through July 31, 2018 with the issuance of 320,743 shares of the Company’s common stock. At December 31,

Table of Contents

2018 and December 31, 2017, the unamortized balance of the convertible note payable was $10,553,888 and $10,982,438, respectively.

Notes Payable

Notes Payable at December 31, 2018 and December 31, 2017 consist of the following:

	December 31, 2018	December 31, 2017
December 2017 note payable	$ 1,673,237	$ 1,587,500
February 2018 note payable	2,359,750	—
March 2018 note payable	1,147,870	—
	$ 5,180,857	$ 1,587,500
Less: unamortized net discount and debt issuance costs	(335,282)	(446,347)
Net convertible notes payable obligation	$ 4,845,575	$ 1,141,153

Interest expense on the Notes Payable was $1,531,451 and $49,287 for the years ended December 31, 2018 and 2017.

December 2017 Note

On December 8, 2017, the Company entered into a securities purchase agreement (the “Securities Purchase Agreement”) with an existing creditor pursuant to which the Company issued a promissory note (the “Note”) in the aggregate principal amount of $1,587,500 for an aggregate purchase price of $1,100,000. The Note carries an original issue discount of $462,500, and the initial principal balance also includes $25,000 to cover CVP’s transaction expenses. The Company will use the proceeds for general corporate purposes. The Note bears interest at the rate of 8% per annum and matures on August 26, 2019. The balance of the note payable as of December 31, 2018 of $1,548,829 consists of the $1,673,237 face value of the note less note discounts of $124,408, and is included in notes payable in the current liabilities section of the consolidated balance sheet.

On August 2, 2018, the Company and CVP amended the December 2017 Note agreement, extending the maturity date from September 8, 2018 to August 26, 2019, and limiting the aggregate amount that CVP is permitted to redeem on a monthly basis to $500,000, which amount is the maximum aggregate amount for the Notes collectively. This amendment resulted in the Company accounting for the transaction as a troubled debt restructuring, under which the carrying amount of the note payable remained unchanged but interest expense is computed using a new effective rate that equates the present value of the future cash payments specified by the new terms with the carrying amount of the note. The principal balance of the note is included in notes payable in the current liabilities section of the balance sheet.

Between October 2018 and December 2018, the Company and CVP renegotiated the terms of the December 2017 Note agreement such that CVP agreed not to make any redemptions of the Note until March 2019. In consideration of this standstill arrangement, the Company paid CVP a total standstill fee of $499,403 for all four CVP Notes. The standstill fee allocated to the December 2017 Note was $141,737, of which $85,737 increased the principle balance and $56,000 was paid in cash. These modifications in whole represented four separate restructurings of the December 2017 Note agreement, resulting in two troubled debt restructurings accounted for under ASC 470-60 and two modifications accounted for under ASC 470-50. For the two restructurings resulting in troubled debt restructurings,

the changes were accounted for prospectively and a new effective interest rate was determined that equated the present value of the future cash payments specified by the new terms with the carrying amount of the Note. For the two modifications that resulted in modification accounting, a new effective rate was determined at the date of modification that equated the revised cash flows to the carrying amount of the Note.

Table of Contents

February 2018 Note

On February 26, 2018, the Company entered into a securities purchase agreement with CVP, pursuant to which the Company issued to CVP a promissory note in the aggregate principal amount of $2,240,909 for an aggregate purchase price of $1,560,000. The Note carries an original issue discount of $655,909, and the initial principal balance also includes $25,000 to cover CVP's transaction expenses. The Company will use the proceeds for general corporate purposes and working capital. The Note bears interest at the rate of 8% per annum and matures on August 26, 2019. The balance of the note payable as of December 31, 2018 of $2,290,865 consists of the $2,359,750 face value of the note less note discounts of $68,885, and is included in notes payable in the current liabilities section of the consolidated balance sheet.

Between October 2018 and December 2018, the Company and CVP renegotiated the terms of the February 2018 Note agreement such that CVP agreed not to make any redemptions of the Note until March 2019. In consideration of this standstill arrangement, the Company paid CVP a total standstill fee of $499,403 for all four CVP Notes. The standstill fee allocated to the February 2018 Note was $198,841, of which $118,841 increased the principle balance and $80,000 was paid in cash. These modifications in whole represented four separate restructurings of the February 2018 Note agreement, resulting in a debt extinguishment accounted for under ASC 470-50, two troubled debt restructurings accounted for under ASC 470-60 and a debt modification accounted for under ASC 470-50. For the debt extinguishment, the Company recorded an extinguishment loss of $102,296. For the two troubled debt restructurings, the changes were accounted for prospectively and a new effective interest rate was determined that equated the present value of the future cash payments specified by the new terms with the carrying amount of the Note. For the modification that resulted in modification accounting, a new effective rate was determined at the date of modification that equated the revised cash flows to the carrying amount of the Note.

March 2018 Note

On March 21, 2018, the Company entered into a securities purchase agreement with CVP, pursuant to which the Company issued to CVP a promissory note in the aggregate principal amount of $1,090,341 for an aggregate purchase price of $750,000. The Note carries an original issue discount of $315,341, and the initial principal balance also includes $25,000 to cover CVP's transaction expenses. The Company will use the proceeds to fully repay certain prior secured and unsecured indebtedness. The Note bears interest at the rate of 8% per annum and matures on September 21, 2019. The balance of the note payable as of December 31, 2018 of $1,005,800 consists of the $1,147,870 face value of the note less note discounts of $141,990, and is included in notes payable in the current liabilities section of the consolidated balance sheet.

Between October 2018 and December 2018, the Company and CVP renegotiated the terms of the March 2018 Note agreement such that CVP agreed not to make any redemptions of the Note until March 2019. In consideration of this standstill arrangement, the Company paid CVP a total standstill fee of $499,403 for all four CVP Notes. The standstill fee allocated to the March 2018 Note was $95,529, of which $57,529 increased the principle balance and $38,000 was paid in cash. These modifications in whole represented four separate restructurings of the March 2018 Note agreement, resulting in a debt extinguishment accounted for under ASC 470-50, two troubled debt restructurings accounted for under ASC 470-60, and a debt modification accounted for under ASC 470-50. For the debt extinguishment, the Company recorded an extinguishment loss of $223,824. For the two troubled debt restructurings, the changes were accounted for prospectively and a new effective interest rate was determined that equated the present value of the future cash payments specified by the new terms with the carrying amount of the Note. For the modification that resulted in modification accounting, a new effective rate was determined at the date of modification that equated the revised cash flows to the carrying amount of the Note.

CVP Notes – Correction of an Error

In September 30, 2018, it was discovered that an error was made in the accounting for the restructuring of notes payable with CVP that dated back to the three months ended March 31, 2018. The Company improperly did not account for the transaction as a debt extinguishment. This error led to the understatement of other expense by approximately $798,000 for the three months ended March 31, 2018 and the understatement of short-term notes payable

Table of Contents

by $798,000 as of March 31, 2018. This error also led to the overstatement of other expense by approximately $322,000 for the three months ended June 30, 2018 and the understatement of short term notes payable by approximately $476,000 as of June 30, 2018. The Company did not deem this error to be material to its consolidated financial statements for the first and second quarter of 2018 and corrected the error via an out of period adjustment recorded to other expense and short term notes payable in the three months ended September 30, 2018.

Long-term Debt

As of December 31, 2018 and 2017, the net long-term debt obligation was as follows:

	December 31, 2018	December 31, 2017
Debt and unpaid accrued end-of-term payment	$ —	$ 1,636,639
Unamortized note discount	—	(6,615)
Unamortized debt issuance costs	—	(20,780)
Net debt obligation	$ —	$ 1,609,244
Current portion of long-term debt	$ —	$ 1,609,244
Long-term debt, net of discount	—	—
Total	$ —	$ 1,609,244

In August 2015, the Company entered into a loan and security agreement with a lender for up to $8.0 million, which provided for an initial loan commitment of $6.0 million. The agreement has a term of three years, with interest only payments through February 29, 2016. Thereafter, principal and interest payments will be made with an interest rate of 9.9%. Additionally, there will be a balloon payment of $600,000 on August 1, 2018 (as modified in the third amendment to the Loan Agreement). This amount is being recognized over the term of the loan agreement and the effective interest rate, considering the balloon payment, is 15.0%. Proceeds to the Company were net of a $134,433 debt discount under the terms of the loan agreement.

On April 21, 2016, the loan and security was amended upon which the Company repaid $1.5 million of the debt out of restricted cash. The amendment modified the repayment amortization schedule providing a four-month period of interest only payments for the period from May through August 2016.

On July 7, 2017, the Company entered into the third amendment to the Loan Agreement upon which the Company paid $1.0 million of the outstanding loan balance, and the Lender waived the prepayment charge associated with such prepayment. The Third Amendment modified the repayment schedule providing a three-month period of interest only payments for the period from August 2017 through October 2017.

On March 23, 2018, the Company paid off the remaining $689,345 of principal, $4,471 of interest, and the end-of-term payment of $600,000 in cash with proceeds from the March 23, 2018 equity financing.

Interest expense on the long-term debt was $99,300 and $526,069 for the years ended December 31, 2018 and 2017.

Table of Contents

Warrants

A summary of common stock warrants outstanding, including associated activity, for the years ended December 31, 2018 and 2017 is as follows:

	Year ended December 31,	
	2018	2017
Warrants outstanding, beginning balance	321,314	397,904
Issuances	2,166,588	106,376
Exercises	—	(60,553)
Expirations and cancellations	(60,249)	(122,413)
Warrants outstanding, end of period	2,427,653	321,314

November 2016 Series A Warrants

In November 2016, the Company entered into a Securities Purchase Agreement with certain institutional investors pursuant to which the Company issued an aggregate of 111,111 shares of the Company's common stock. The investors also received warrants to purchase up to an aggregate of 111,111 shares of the Company's common stock, at an exercise price of $11.25 per share, or the Series A Warrants, and the Placement Agent received warrants to purchase 8,889 shares of our common stock in lieu of cash for service fees with the same terms as the investors. The Series A warrants and placement agent warrants warrants were initially valued using the Black-Scholes-Merton warrant pricing model using the following assumptions: 111,111 warrant shares with a strike price of $11.25 per share and an expiration date of May 29, 2022; and 8,889 warrant shares to the placement agent with a strike price of $11.25 and an expiration date of May 29, 2022; the expected life is 5.5 years, the volatility was 71.92% and the risk free rate was 1.87%. The issuance date fair value of these warrants was $756,001and they were classified as a warrant liability in the Company's balance sheet. As of December 31, 2018 and 2017, the warrant liability was valued at $7,388 and $103,860 respectively. The change of $96,472 was recorded as a gain in the Company's statements of operations.

November 2016 Series B and C Warrants

In November 2016,as part of the same financing transaction in which the Series A warrants were issued, the Company also issued the Series B and Series C warrants to purchase 111,111 and 111,111 shares of the Company's common stock, respectively. The series B and C warrants were classified as equity, and as such were not subject to subsequent revaluation. All of the Series B warrants expired unexercised in November 2017, while all unexercised Series C warrants expired in May 2018.

July 2017 Napo Warrants

In July 2017, the Company granted warrants to purchase 81,649 shares of common stock of the Company at an exercise price of $1.20 per share to replace Napo warrants upon the consummation of the July 2017 Merger. Of the 81,649 warrants, 9,696 warrants expire on December 31, 2018 and 71,953 warrants expire on December 31, 2025. The warrants were valued at $630,859, using the Black-Scholes option pricing model as follows: exercise price of $0.08 per share, stock price of $0.56 per share, expected life ranging from 1.42 years to 8.42 years, volatility ranging from 75.07% to 110.03%, and risk-free rate ranging from 1.28% to 2.14%. The warrants were classified in equity.

August 2018 Financing Warrants

In August 2018, in consideration of services provided, the Company issiued a warrant to purchase 30,000 shares of common stock which were exercisable only in the event that the Company raised new financing of at leat $3 million, and expired five years from the date of issuance. The warrants were valued at $17,582 using the Black-Scholes option pricing model as follows: exercise price of $1.06 per share, stock price of $1.06 per share, expected life of five years, volatility of 126%, and a risk-free rate of 3.83%. The warrants were classified in stockholders' equity. In October 2018, in a public offering, the Company met the $3 million new financing threshold and the warrants became exercisable.

Table of Contents

August 2018 License Transaction Warrants

In August 2018, in consideration of services provided, the Company issiued a warrant the exercise of which was contingent upon either (i) the Company consummating a Licensing Transaction within six months of August 2018, the occurrence of which would result in the warrant becoming immediately exercisable for 66,667 shares of common stock, or (ii) the Company consummating a Licensing Transaction after six months and within twelve months of August 2018, the occurrence of which would result in the warrant becoming immediately exercisable for 33,333 shares common stock. The warrant was valued at $6,312 using the Black-Scholes option pricing model as follows: exercise price of $1.06 per share, stock price of $1.06 per share, expected life of five years, volatility of 126%, and a risk-free rate of 3.83%. The warrants were classified in stockholders' equity.

October2018 Underwriter Warrants

In October 2018, in consideration of services provided leading up to the Company's October 2018 public offering, the Company issued warrants to various service providers to purchase an aggregate of 1,200,000 shares of common stock at an exercise price of $0.75 per common share. The warrants were valued at $611,286 using the Black-Scholes option pricing model as follows: exercise price of $0.75 per share, stock price of $0.59 per share, expected life of five years, volatility of 138%, and a risk-free rate of 2.51%. The warrants were classified as liabilities pursuant to ASC 815-40 as there was potential cash settlement. As of December 31, 2018, the warrant liability was valued at $212,988. The change of $398,298 was recorded as a gain in the Company's statements of operations.

9. Convertible Preferred Stock

In March 2018, the Company entered into a stock purchase agreement with Sagard Capital Partners, L.P. pursuant to which the Company, in a private placement, agreed to issue and sell to Sagard 5,524,926 shares of the Company's series A convertible participating preferred stock, $0.0001 par value per share, for an aggregate purchase price of $9,000,002. Each share of preferred stock is initially convertible into nine shares of common stock at the option of the holder at an effective conversion price of $0.185 per share (based on an original price per Preferred Share of $1.665), provided that, at any time prior to the time the Company obtains stockholder approval, as required pursuant to Nasdaq Rule 5635(b) any conversion of Preferred Stock by a holder into shares of the Common Stock would be prohibited if, as a result of such conversion, the holder, together with such holder's attribution parties, would beneficially own more than 19.99% of the total number of shares of the Common Stock issued and outstanding after giving effect to such conversion. Subject to certain limited exceptions, the shares of Preferred Stock cannot be offered, pledged or sold by Sagard for one year from the date of issuance. The conversion price is subject to certain adjustments in the event of any stock dividend, stock split, reverse stock split, combination or other similar recapitalization.

Holders of the Series A shares are entitled to participate equally and ratably with the holders of common stock shares in all dividends paid and distributions made to the holders of the common stock as if, immediately prior to each record date of the common stock, the shares of Series A then outstanding were converted into shares of common stock.

In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Company or deemed liquidation event, the holders of Series A shares then outstanding shall be entitled to be paid in cash out of the assets of the Company before any payment shall be made to the holders of common stock or shares of any series or class of preferred or other capital stock then outstanding that by its terms is junior to the Series A in respect of the preferences as to distributions and payments upon such liquidation event by reason of their ownership, an amount per share of

Series A equal to one times the Series A original issue price.

The redemption and liquidation value of the series A preferred stock is $12,738,822 and $9,199,002, respectively. If a Redemption Event occurs as of the Measurement Date (the later of April 30, 2021 and the date on which the Company files its Form 10 Q for the three months ending March 31, 2021, but in no event later than September 30, 2021), the holders of at least a majority of the shares of Series A then outstanding may require the Company to redeem all Series A shares at a per share purchase price equal to $2.3057; any one of the following conditions can result in a Redemption Event that is not solely within the Company's control: Revenues attributable to

Table of Contents

the Mytesi product for the six-month period ended March 31, 2021 are less than $22.0 million or the average VWAP for the Company's common stock for the 30 days prior to a Measurement Date is less than $1.00.

The effective conversion price is $0.185 per share while the fair value of the Company's common stock at the commitment date was $0.205 per share based on the closing price of common stock on March 23, 2018. As a result, the Company determined that there is a Beneficial Conversion Feature (“BCF”) amounting to approximately $995,000, which is computed by taking the difference between the closing price of the stock on March 23, 2018 and the conversion price multiplied by the as if converted 49,724,334 shares (5,524,926 preferred shares multiplied by the conversion factor of 9). The Company's Series A shares do not have a stated conversion date and are immediately convertible at the issuance date. Based on the guidance above, the Company recorded a deemed dividend charge of $995,000 for the accretion of the discount on the Series A shares. The deemed dividend was a non-cash transaction and is reflected below net loss to arrive at net loss available to common stockholders on the Company's condensed consolidated statement of operations for the fiscal year ended December 31, 2018.

The preferred stock has been classified outside of stockholders' equity in accordance with authoritative guidance for the classification and measurement of redeemable securities.

10. Stockholders’ Equity

Common Stock

The holders of common stock are entitled to one vote for each share of common stock held. The common stockholders are also entitled to receive dividends whenever funds and assets are legally available and when declared by the Board of directors.

The holders of non-voting common stock are not entitled to vote, except on an as converted basis with respect to any change of control of the Company that is submitted to the stockholders of the Company for approval. Shares of the Company's non-voting common stock have the same rights to dividends and other distributions and are convertible into shares of the Company's common stock on a one-for-one basis upon transfers to non-affiliates of Nantucket ("former creditor of Napo"), upon the release from escrow of certain non-voting shares held by the former creditors of Napo to the legacy stockholders of Napo under specified conditions and at any time on or after April 1, 2018 at the option of the respective holders thereof.

In June 2018, the Company effected a 1 for 15 reverse stock split of the Company's issued and outstanding shares of Common Stock. The reverse split has been reflected in all voting common stock, warrants, and common stock option shares disclosed in these financial statements. The non-voting common stock and the convertible preferred stock were excluded from the reverse split.

In June 2018, the Company decreased its total number of authorized shares of Common Stock such that the total number of the shares that the Company has authority to issue is 210,000,000 shares, of which 150,000,000 shares are Common Stock, 50,000,000 are non-voting common stock and 10,000,000 shares are “blank check” preferred stock.

In October 2018, in a public offering the Company issued and sold 11,575,001 shares of its common stock at $0.60 per share and 3,425,000 pre-funded warrants to purchase shares of common stock at $0.59 per share for gross proceeds of of $9.0 million, The pre-funded warrants were all exercised in October 2018 at an exercise price of $0.01 per share. The net proceeds to the Company from the offering, after deducting underwriters’ discounts and commissions and other offering costs and expenses, was approximately $7.2 million. The pre-funded warrants

represented prepaid equity forward contracts that were equity classified, as they were not subject to ASC 480 and did not meet the definition of a derivative under ASC 815 due to their requiring a substantial upfront payment.

Table of Contents

As of December 31, 2018 and 2017, the Company had reserved shares of common stock, on an as-if converted basis, for issuance as follows:

	December 31, 2018	December 31, 2017
Options issued and outstanding	2,944,148	2,984,304
Inducement options issued and outstanding	208,865	—
Options available for grant under stock option plans	162,892	513,385
RSU awards issued and outstanding	392,904	392,923
Warrants issued and outstanding	2,427,653	443,756
Convertible notes	759,396	1,036,717
Total	6,895,858	5,371,085

11. Stock Based Compensation

2013 Equity Incentive Plan

In November 2013, the Company's board of directors and sole stockholder adopted the Jaguar Health, Inc. 2013 Equity Incentive Plan (the “2013 Plan”). The 2013 Plan allows the Company's board of directors to grant stock options, restricted stock awards and restricted stock unit awards to employees, officers, directors and consultants of the Company. Following the effective date of the IPO and after effectiveness of any grants under the 2013 Plan that were contingent on the IPO, no additional stock awards will be granted under the 2013 Plan. Outstanding grants continue to be exercisable, however any unissued shares under the plan and any forfeitures of outstanding options do not rollover to the 2014 Stock Incentive Plan. There were 33,769 option shares outstanding at December 31, 2018.

2014 Stock Incentive Plan

Effective May 12, 2015, the Company adopted the Jaguar Health, Inc. 2014 Stock Incentive Plan (“2014 Plan”). The 2014 Plan provides for the grant of options, restricted stock and restricted stock units to eligible employees, directors and consultants to purchase the Company's common stock. The 2014 Plan that provides for automatic share increases on the first day of each fiscal year in the amount of 2% of the outstanding number of shares of the Company's common stock on last day of the preceding calendar year. The 2014 Plan replaced the 2013 Plan except that all outstanding options under the 2013 Plan remain outstanding until exercised, cancelled or expired.

Stock Options and Restricted Stock Units (“RSUs”)

Activity under the 2013 Plan and the 2014 Plan is set forth below:

	Shares	Stock	Weighted Average	Weighted Average Remaining	Aggregate

	Available for Grant	Options Outstanding	RSUs Outstanding	Stock Option Exercise Price	Contractual Life (Years)	Intrinsic Value*
Outstanding at December 31, 2017	3,619	229,575	392,904	$ 28.05	8.31	$ —
Additional shares authorized	2,877,766	—	—	—	—	
Options granted	(2,868,673)	2,868,673	—	1.60	—	—
Options cancelled	150,180	(154,100)	—	4.57	—	—
Outstanding at December 31, 2018	162,892	2,944,148	392,904	$ 5.81	9.24	$ —
Exercisable at December 31, 2018		616,309		$ 10.86	8.90	$ —
Vested and expected to vest at December 31, 2018		2,849,994		$ 6.02	9.24	$ —

* Fair market value of JAGX stock on December 31, 2018 was $0.23 per share.

Table of Contents

The intrinsic value is calculated as the difference between the exercise price of the underlying options and the fair market value of the Company's common stock for options that were in-the-money.

The weighted average grant date fair value of stock options granted was $1.60 and $1.95 per share during the years ended December 31, 2018 and 2017.

The number of options that vested in the years ended December 31, 2018 and 2017 was 881,314 and 687,634, respectively. The grant date weighted average fair value of options that vested in the years ended December 31, 2018 and 2017 was $ 2,055,576 and $712,718, respectively.

No options were exercised in the years ended December 31, 2018 and 2017.

The Company granted 209,531 inducement options in fiscal year 2018 to new employees. These options are all non-statutory and were issued outside of the Company’s 2014 Stock Plan. The weighted average grant-date fair value of the options was $1.34 per share. Stock-based compensation expense related to the inducement stock for the fiscal year 2018 was $52,577.

The Company has granted RSUs under both the 2013 Plan and the 2014 Plan. The units granted have varying vesting terms, including RSU’s that vest upon the occurrence of both a liquidity event and satisfaction of the service-based requirement. The stock-based compensation expense is based on the grant date fair market value of the Company’s common stock, and is amortized over the vesting period using the straight-line method, net of estimated forfeitures. There were 392,904 RSU’s outstanding at December 31, 2018 and 2017.

Stock-Based Compensation

The following table summarizes stock-based compensation expense related to stock options, inducement stock options and RSUs for the years ended December 31, 2018 and 2017, and are included in the consolidated statements of operations as follows:

	Year Ended December 31,	
	2018	2017
Research and development expense	$ 579,641	$ 216,932
Sales and marketing expense	96,730	32,325
General and administrative expense	1,347,503	565,356
Total	$ 2,023,874	$ 814,613

As of December 31, 2018, the Company had $2,860,071 of unrecognized stock-based compensation expense for options and RSU’s, which is expected to be recognized over a weighted-average period of 2.0 years.

The estimated grant-date fair value of employee stock option grants was calculated using the Black-Scholes -Merton option-pricing model using the following assumptions:

	Year Ended December 31,			
	2018		2017	
Weighted-average volatility	87.4 - 105.9	%	74.3 - 90.5	%
Weighted-average expected term (years)	5.1 - 5.8		5.1 - 5.8	
Risk-free interest rate	2.6 - 2.9	%	2.0 - 2.3	%
Expected dividend yield	—		—	

The estimated period-end fair value of non-employee stock options was calculated using the Black-Scholes -

Table of Contents

Merton option-pricing model using the following assumptions:

	Year Ended December 31, 2018		2017	
Weighted-average volatility	83.6 - 89.2	%	85.4 - 85.7	%
Weighted-average expected term (years)	9.1 - 9.7		9.8 - 10.0	
Risk-free interest rate	2.6 - 3.0	%	2.4 - 2.5	%
Expected dividend yield	—		—	

401(k) Plan

The Company sponsors a 401(k) defined contribution plan covering all employees. There were no employer contributions to the plan from plan inception through December 31, 2018.

12. Net Loss Per Share Attributable to Common Stockholders

The following table presents the calculation of basic and diluted net loss per common share for the years ended December 31, 2018 and 2017:

	Years Ended December 31, 2018	2017
Net loss attributable to common stockholders (basic)	(32,146,057)	$ (21,968,614)
Shares used to compute net loss per common share, basic and diluted	14,681,044	2,895,729
Net loss per share attributable to common stockholders, basic and diluted	$ (2.19)	$ (7.59)

Basic net loss per share is calculated by dividing net loss by the weighted-average number of common shares outstanding during the period. Diluted net loss per share is computed by dividing net loss by the weighted-average number of common shares and common share equivalents outstanding for the period. Common stock equivalents are only included when their effect is dilutive. The Company's potentially dilutive securities which include stock options, convertible preferred stock and common stock warrants have been excluded from the computation of diluted net loss per share as they would be anti-dilutive. For all periods presented, there is no difference in the number of shares used to compute basic and diluted shares outstanding due to the Company's net loss position.

The following outstanding common stock equivalents have been excluded from diluted net loss per common share for the years ended December 31, 2018 and 2017 because their inclusion would be anti-dilutive:

	December 31, 2018	December 31, 2017

Options issued and outstanding	2,944,148	3,444,663
Warrants to purchase common stock	2,427,653	4,820,025
Restricted stock units	392,904	5,893,849
Total	5,764,705	14,158,537

13. Income Taxes

The Company's loss before provision for income taxes during the years ended December 31, 2018 and 2017, was a domestic loss of $32,146,057 and $35,149,856, respectively.

The effective tax rate for 2018 and 2017 was 0% and (38)%, respectively. As a result of the Company's history of net operating losses and full valuation allowance against its deferred tax assets, there was no current or deferred

Table of Contents

income tax provision for the year ended December 31, 2018. As a result of the acquisition of Napo Pharmaceuticals on July 31, 2017, the Company recorded a tax benefit of $13,181,242 for the year ended December 31, 2017. This tax benefit is a result of the partial release of its existing valuation allowance since the acquired deferred tax liabilities from Napo will provide a source of income for the Company to realize a portion of its deferred tax assets, for which a valuation allowance is no longer needed.

The components of the provision for income taxes during the years ended December 31, 2018 and 2017 is as follows:

	December 31, 2018	December 31, 2017
Current:		
Federal	$ —	$ —
State	—	—
Foreign	—	—
Total Current	—	—
Deferred:		
Federal	—	(12,165,311)
State	—	(1,015,931)
Foreign	—	—
Total Deferred	—	(13,181,242)
Total Provision for Income Taxes	$ —	$ (13,181,242)

The Company’s effective tax during the years ended December 31, 2018 and 2017, differed from the federal statutory rate as follows:

	December 31, 2018		December 31, 2017	
Statutory Rate	(21.0)	%	(34.0)	%
State Taxes	(5.6)	%	(2.2)	%
Tax Credits	(0.2)	%	(0.2)	%
Goodwill and Indefinite-lived Intangible Asset Impairment	3.4	%	16.3	%
Other	1.0	%	3.6	%
Effect of U.S. tax law change	—	%	2.6	%
Valuation Allowance	22.4	%	(23.6)	%
Effective Tax Rate	—	%	(37.5)	%

Table of Contents

Net deferred tax assets as of December 31, 2018 and 2017 consist of the following:

	December 31, 2018	December 31, 2017
Non-current deferred tax assets:		
Net operating losses	$ 12,156,279	$ 5,827,970
Tax credits	329,563	325,188
Stock compensation	1,479,325	1,198,657
Fixed assets and intangibles	—	—
Other	573,441	312,949
	14,538,608	7,664,764
Valuation allowance	(8,512,820)	(1,625,782)
Net non-current deferred tax assets	6,025,788	6,038,982
Non-current deferred tax liabilities:		
Fixed assets and intangibles	(6,025,788)	(6,038,982)
Net non-current deferred tax liability	(6,025,788)	(6,038,982)
Net non-current deferred tax asset (liability)	—	—

A valuation allowance is provided when it is more likely than not that the deferred tax assets will not be realized. The Company has established a valuation allowance to offset net deferred tax assets as of December 31, 2018 and 2017, due to the uncertainty of realizing future tax benefits from its net operating loss carryforwards and other deferred tax assets.

The valuation allowance increased by $6,887,038 during the year ended December 31, 2018.

On December 22, 2017, President Trump signed the Tax Cuts and Jobs Act of 2017 (the “Act”) into law. The new legislation decreases the U.S. corporate federal income tax rate from 35% to 21% effective January 1, 2018. The Act also includes a number of other provisions including the elimination of loss carrybacks and limitations on the use of future losses and repeal of the Alternative Minimum Tax regime. As of December 31, 2017, the Company had calculated its best estimate of the impact of the Tax Act in its year end income tax provision in accordance with its understanding of the Tax Act and guidance available as of the date of this filing. The provisional amount related to the re-measurement of certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future was a net decrease related to deferred tax assets and deferred tax liabilities of $914,534 with a corresponding offsetting change in valuation allowance of $914,534 for the year ended December 31, 2017. The Company has completed their analysis of the impact of the Act. There was no change to the provisional amount as of December 31, 2018.

As of December 31, 2018, the Company had federal and California net operating loss carryovers of approximately $43,770,861 and $40,830,415, respectively. The federal and California net operating losses will begin to expire in 2027.

As of December 31, 2018, the Company had federal and California research credit carryovers of approximately $64,047 and $440,388, respectively. The federal research credits will begin to expire in 2038. The California research credits carry forward indefinitely.

Utilization of the domestic NOL and tax credit forwards may be subject to a substantial annual limitation due to ownership change limitations that may have occurred or that could occur in the future, as required by the Internal Revenue Code Section 382, as well as similar state provisions. In general, an "ownership change," as defined by the code, results from a transaction or series of transactions over a three-year period resulting in an ownership change of more than 50 percentage points of the outstanding stock of a company by certain stockholders or public groups. Any limitation may result in expiration of all or a portion of the NOL or tax credit carryforwards before utilization. As of December 31, 2018, the Company has reduced its federal and California gross net operating loss by $99,989,021 and $44,557,023 respectively. The Company also reduced its federal and California R&D credit carryforwards by $1,415,339 and $696,670, respectively.

Table of Contents

Uncertain Tax Positions

The Company has adopted the provisions of ASC 740, Income Taxes Related to Uncertain Tax Positions. Under these principals, tax position are evaluated in a two-step process. The Company first determines whether it is more-likely-than-not that a tax positions will be sustained upon examination. If a tax position meets the more-likely-than-not recognition threshold it is then measured to determine the amount of benefit to be recognized in the financial statements. The tax position is measured as the largest amount of benefit that has a greater than 50 percent likelihood of being realized upon ultimate settlement.

The following is a reconciliation of the beginning and ending amount of our total gross unrecognized tax benefit liabilities:

	December 31, 2018	December 31, 2017
Gross Unrecognized Tax Benefit--Beginning Balance	$ 97,010	$ 113,073
Increases Related to Tax Positions from Prior Years	(20,607)	(55,960)
Increases Related to Tax Positions Taken During the Current Year	24,486	39,897
Gross Unrecognized Tax Benefit--Ending Balance	$ 100,889	$ 97,010

14. Segment Data

Prior to the merger with Napo, the Company managed its operation as a single segment for the purposes of assessing performance and making operating decisions. The Company reorganized their segments to reflect the change in the organizational structure resulting from the merger with Napo. Post-merger with Napo, the Company manages its operations through two segments. The Company has two reportable segments-human health and animal health. The animal health segment is focused on developing and commercializing prescription and non-prescription products for companion and production animals. The human health segment is focused on developing and commercializing of human products and the ongoing commercialization of Mytesi, which is approved by the U.S. FDA for the

symptomatic relief of non-infectious diarrhea in adults with HIV/AIDS on antiretroviral therapy.

The Company's reportable segments net sales and net income consisted of:

	Year Ended December 31, 2018	2017
Revenue from external customers		
Human Health	$ 4,121,913	$ 1,062,920
Animal Health	294,232	3,298,266
Consolidated Totals	$ 4,416,145	$ 4,361,186
Segment profit (loss)		
Human Health	$ (12,337,529)	$ (14,860,754)
Animal Health	(19,808,528)	(7,107,860)
Consolidated Totals	$ (32,146,057)	$ (21,968,614)

Table of Contents

The Company's reportable segments assets consisted of the following:

	December 31, 2018	December 31, 2017
Segment assets		
Human Health	$ 37,985,935	$ 41,754,603
Animal Health	54,893,593	36,807,184
Total	$ 92,879,528	$ 78,561,787

The reconciliation of segments assets to the consolidated assets is as follows:

	2018	2017
Total assets for reportable segments	$ 92,879,528	$ 78,561,787
Less: Investment in subsidiary	(29,240,965)	(29,240,965)
Less: Intercompany loan	(22,596,618)	(2,000,000)
Less: Intercompany receivable	—	(3,691,616)
Consolidated Totals	$ 41,041,945	$ 43,629,206

15. Subsequent Events

The Company completed an evaluation of the impact of subsequent events through April 5, 2019, the date these financial statements were issued.

Oasis Equity Lines

On January 7, 2019, the Company entered into a common stock purchase agreement (the ''January CSPA'') with Oasis Capital, relating to an offering (the ''Original Equity Line Offering'') of an aggregate of up to 5,633,333 shares (the ''Original Shares'') of Common Stock, of which 5,333,333 of such Original Shares are being offered in a primary offering consisting of an equity line of credit. Jaguar initially issued 300,000 shares of Common Stock (the ''Commitment Shares'') to Oasis Capital as an inducement to enter into the January CSPA. Additionally, under the terms of the January CSPA, the Company has the right to ''put,'' or sell, up to 5,333,333 shares of Common Stock (the ''January Purchase Shares'') to Oasis Capital for an amount equal to the product of (i) the number of January Purchase Shares set forth on the applicable put notice (minus the deposit and clearing fees associated with such purchase) and (ii) a fixed price of $0.75 per share or such other price agreed upon between the Company and Oasis Capital. The Company had the option to increase the equity line of credit by an additional 8,000,000 shares of Common Stock by notifying Oasis Capital at any time after the effective date of the January CSPA (the ''January Upsize Option''). On March 18, 2019, the Company delivered a notice to Oasis Capital of its decision to exercise the January Upsize Option. The Company has sold the Original Shares and all 8,000,000 shares of Common Stock under the January Upsize Option to Oasis Capital.

On April 1, 2019, the Company entered into another common stock purchase agreement (the "April CSPA") with Oasis Capital relating to an offering (the "April Equity Line Offering") of an aggregate of up to 20,000,000 shares (the "April Purchase Shares") of the Company's common stock, all of which are being offered in a primary offering consisting of an equity line of credit. Under the terms of the April CSPA, the Company has the right to "put," or sell, the April Purchase Shares to Oasis Capital for an amount equalt to the product of (i) the number of April Purchase Shares set forth in the applicable put notice (minus the deposit and clearing fees associated with such purchase) and (ii) a fixed price of $0.28 per share or such other price agreed upon between the Company and Oasis Capital. The Company had the option to increase the equity line of credit by an additional 20,000,000 shares of Common Stock by notifying Oasis Capital at any time after the effective date of the April CSPA.

Table of Contents

Offering of Notes and Warrants

On March 18, 2019, the Company began entering into securities purchase agreements (each, a ‘‘Securities Purchase Agreement’’) with selected accredited investors (each, an ‘‘Investor’’), pursuant to which the Company intends to issue up to $5.5 million aggregate principal amount of promissory notes (collectively, the ‘‘Notes’’) to such Investors. As an inducement for entering into the Securities Purchase Agreement, each Investor also received warrants exercisable for shares of Common Stock (the ‘‘Investor Warrants’’). The initial offering closed on March 18, 2019, and as of April 4, 2019, $1.9 million aggregate principal amount of Notes were issued in offerings and the proceeds from such offerings were paid to the Company.

CVP Note Exchanges

In January through March 2019, the Company entered into exchange agreements with Chicago Venture Partners L.P. (‘‘CVP’’), pursuant to which the Company issued 18,764,637 shares of Common Stock in the aggregate to CVP in exchange for a reduction of approximately $4.4 million in the principal amount of the secured promissory notes (the “CVP Notes”) issued to CVP. The shares of Common Stock that were exchanged for portions of the CVP Notes were issued in reliance on the exemption from registration provided under Section 3(a)(9) of the Securities Act.

Sagard - Material Modifications to Rights of Security Holders

On March 14, 2019, the Company, with the written consent of the sole holder of the Company’s issued and outstanding Series A convertible participating preferred stock, filed a Certificate of Amendment to the Certificate of Designation of Series A Convertible Participating Preferred Stock of the Company with the Secretary of State of the State of Delaware to (a) adjust the conversion price of the shares of Series A Preferred Stock from $2.775 per share to $0.2775 per share, provided that with respect to the right to vote on an as-converted basis with holders of the Company’s common stock, holders of Series A Preferred Stock will not be entitled to vote on any matter presented to the stockholders of the Company to the extent that such vote would be in violation of Nasdaq Listing Rule 5640, and (b) adjust the 30-day volume-weighted average price (“VWAP”) threshold applicable to the Company’s optional redemption right and the preferred stockholders’ mandatory redemption right from $15.00 to $1.50. The Amendment became effective upon filing with the Secretary of the State of Delaware.

Registered Direct Offering

On March 24, 2019, the Company entered into a securities purchase agreement (the ‘‘Purchase Agreement’’) with Oasis Capital, pursuant to which the Company agreed to issue and sell, in a registered public offering by the Company directly to Oasis Capital (the ‘‘RDO’’), an aggregate of 1,331,332 shares of Common Stock (the ‘‘RDO Shares’’) at an offering price of $0.20 per share for gross proceeds of approximately $266,266 before deducting the placement agent fee and related offering expenses.

On March 24, 2019, the Company entered into a Placement Agency Agreement (the ‘‘Placement Agency Agreement’’) with Ladenburg Thalmann & Co. Inc. (‘‘Ladenburg’’ or the ‘‘Placement Agent’’), pursuant to which the Company engaged Ladenburg as the sole placement agent in connection with the RDO. The Placement Agent agreed to use its reasonable best efforts to arrange for the sale of the RDO Shares. In connection with the RDO, the Placement Agent received a placement agent fee in cash equal to 8% of the gross proceeds from the sale of the RDO Shares, a management fee in cash equal to 1% of the gross proceeds from the sale of the RDO Shares, a warrant to purchase 53,253 shares of Common Stock at an exercise price of $0.25 per share (the ‘‘Placement Agent Warrant’’), and reimbursement of up to $25,000 in expenses.

126

Table of Contents

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Disclosure Controls and Procedures

Our management, Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2018. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms.

Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were not comprehensively effective at the reasonable assurance level as of December 31, 2018. This conclusion was based on the material weakness in our internal control over financial reporting further described below.

Material Weakness

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of our annual or interim consolidated financial statements will not be prevented or detected and corrected on a timely basis. In connection with our preparation of our annual financial statements for the year ended December 31, 2018, we identified a material weakness in our internal control over financial reporting related to staff turnover in our accounting department. We did not maintain a sufficient complement of internal personnel with appropriate knowledge, experience and/or training commensurate with our financial reporting requirements. We relied on outside consulting technical experts and did not maintain adequate internal qualified personnel to properly supervise and review the information provided by the outside consulting technical experts to ensure certain significant complex transactions and technical matters were properly accounted for, specifically with respect to accurately reflecting all potential accrued services on the balance sheet at December 31, 2018. In addition, we identified inadequate internal technical staffing levels and expertise to properly supervise and review the information of the outside consulting technical experts to properly apply ASC 815-40 for liability classification of certain warrants and ASC 470-50 and ASC 470-60 to properly reflect the accounting impact to multiple modifications of the Company’s debt instruments. We have concluded that we must implement new or improved controls in our financial statement close process and policies in reviewing information received from our outside consulting technical experts.

Remediation Efforts to Address Material Weakness

We have prepared a preliminary remediation plan to address the underlying causes of the material weakness described above. The preliminary remediation plan includes:

· Reassessing the design and operation of internal controls over financial reporting, including interim and annual accruals cutoff procedures and review procedures related to information received from our outside consulting technical experts;

Table of Contents

- Hiring and training of permanent accounting personnel to further educate the staff on the accounting of significant complex transactions and technical accounting matters;
- Increasing staffing levels and expertise to implement this remediation plan

We cannot assure you that the measures we may take in response to this material weakness will be sufficient to remediate such material weakness or to avoid potential future material weaknesses.

Material Weakness Previously Identified for the year ended December 31, 2017

As previously reported in our annual report on Form 10-K for the year ended December 31, 2017, management concluded that, as of such date, our disclosure controls and procedures were not effective due to the existence of a material weakness in the design and operating effectiveness of an internal control related to review of our tax provision. In connection with the audit of our financial statements as of and for the year ended December 31, 2017, we did not adequately and timely review the accounting for income taxes. While we utilized the assistance of an external income tax specialist to prepare our annual tax provision, management has concluded that there was a material weakness in the design of our income tax controls in that our policy that governs the data validation controls over data provided to and received from the external income tax specialist and the management review controls were not designed with appropriate levels of precision and were not undertaken in a timely manner, which resulted in an extension to file our Annual Report on Form 10-K.

Remediation of Material Weakness for the year ended December 31, 2017

Subsequent to the identification of the material weakness, we have enhanced existing controls and design and implemented new controls applicable to our tax accounting to ensure that our income tax balances are accurately calculated and appropriately reflected in our financial statements on a timely basis. We have devoted significant time and attention to remediate the above material weakness. These improvements to our internal control infrastructure were implemented over the course of the first three quarters of 2018, and were in place in connection with the preparation of our financial statements for the year ended December 31, 2018. As such, we believe that the remediation initiative outlined above was sufficient to remediate the material weakness in internal control over financial reporting as discussed above.

Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rule 13a-15(f) and 15d-15(c) under the Exchange Act. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of the effectiveness of internal control to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies or procedures may deteriorate. Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2018 using the criteria established in Internal Control Integrated Framework (“2013 Framework”) issued by the Committee of Sponsoring Organization of the Treadway Commission (“COSO”). Based on our evaluation using those criteria, our management has concluded that, as of December 31, 2018, our internal control over financial reporting was not effective to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles for the reasons discussed above.

This Annual Report on Form 10-K does not include an attestation report of our registered public accounting firm on our internal control over financial reporting because we are a smaller reporting company and are not subject to auditor attestation requirements under applicable SEC rules.

128

Table of Contents

Changes in Internal Control over Financial Reporting

Other than the changes disclosed above regarding the remediation of the previous material weakness, there were no changes in our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting during the fourth quarter of 2018.

ITEM 9B. OTHER INFORMATION

None.

Table of Contents

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this item is incorporated by reference from the Proxy Statement for the 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this item is incorporated by reference from the information under the captions "Compensation of Directors and Executive Officers" contained in the Proxy Statement for the 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this item is incorporated by reference from the information under the captions "Security Ownership of Certain Beneficial Owners and Management" and "Compensation of Directors and Executive Officers—Equity Compensation "contained in the Proxy Statement for the 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this item is incorporated by reference from the information under the caption "Proposal 1—Election of Directors—Director Independence" and "Certain Relationships and Related Transactions" contained in the Proxy Statement for the 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this item is incorporated by reference from the information under the caption "Proposal 2—Ratification of the Appointment of Independent Registered Public Accounting Firm—Principal Accountant Fees and Services" contained in the Proxy Statement for the 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

Table of Contents

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

Exhibit No.	Description
2.1	Agreement and Plan of Merger, dated as of March 31, 2017, by and among Jaguar Health, Inc. (f/k/a Jaguar Animal Health, Inc.), Napo Acquisition Corporation, Napo Pharmaceuticals, Inc. and Gregory Stock (incorporated by reference to Exhibit 2.1 to the Current Report on Form 8_K of Jaguar Health, Inc. filed March 31, 2017, File No. 001_36714).
3.1	Third Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8_K (No. 001_36714) filed with the Securities and Exchange Commission on August 1, 2017).
3.2	Certificate of Amendment of the Third Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.2 to the Annual Report on Form 10-K filed with the Securities and Exchange Commission on April 9, 2018).
3.3	Certificate of Second Amendment of the Third Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K filed with the Securities and Exchange Commission on June 1, 2018).
3.4	Certificate of Third Amendment of the Third Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.2 to the Current Report on Form 8-K filed with the Securities and Exchange Commission on June 1, 2018).
3.5	Certificate of Designation of Series A Convertible Participating Preferred Stock (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8_K (filed with the Securities and Exchange Commission on March 27, 2018).
3.6	Amended and Restated Bylaws (incorporated by reference to Exhibit 3.2 to the Current Report on Form 8_K (No. 001_36714) filed with the Securities and Exchange Commission on May 18, 2015).
4.1	Specimen Common Stock Certificate of Jaguar Health, Inc. (incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K filed with the Securities and Exchange Commission on June 1, 2018).
4.2	Secured Convertible Promissory Note, dated June 29, 2017, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 4.1 to the Current Report on Form 8_K filed on July 3, 2017).
4.3	Specimen Non_Voting Common Stock Certificate of Jaguar Health, Inc. (incorporated by reference to Exhibit 4.1 to the Form 8_K of Jaguar Health, Inc. filed August 1, 2017, File No. 001_36714).
4.4	Secured Promissory Note, dated December 8, 2017, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 4.1 to the Current Report on Form 8_K filed on December 14, 2017).
4.5	Secured Promissory Note, dated February 26, 2018, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 4.1 to the Current Report on Form 8_K filed on March 2, 2018).
4.6	Secured Promissory Note, dated March 21, 2018, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 4.1 to the Current Report on Form 8_K filed on March 27, 2018).
4.7	Common Stock Warrant, dated August 28, 2018, by and between Jaguar Health, Inc. and the holder named therein (incorporated by reference to Ex. 4.1 to the Current Report on Form 8_K filed on September 4, 2018).
4.8	Convertible Promissory Note, dated September 11, 2018, by and between Jaguar Health, Inc. and L2 Capital, LLC (incorporated by reference to Ex. 4.1 to the Current Report on Form 8_K filed on September 12, 2018).
4.9	

	Convertible Promissory Note, dated September 11, 2018, by and between Jaguar Health, Inc. and Charles Conte (incorporated by reference to Ex. 4.2 to the Current Report on Form 8 K filed on September 12, 2018).
4.10	Common Stock Warrant, dated September 11, 2018, by and between Jaguar Health, Inc. and L2 Capital, LLC (incorporated by reference to Ex. 4.3 to the Current Report on Form 8 K filed on September 12, 2018).
4.11	Common Stock Warrant, dated September 11, 2018, by and between Jaguar Health, Inc. and Charles Conte (incorporated by reference to Ex. 4.4 to the Current Report on Form 8 K filed on September 12, 2018).

Table of Contents

Exhibit No.	Description
4.12	Form of Pre-Funded Warrant (incorporated by reference to Exhibit 4.6 to the Registration Statement on Form S_1 (No. 333_227292) filed with the Securities and Exchange Commission on October 1, 2018).
10.1‡	Form of Indemnification Agreement by and between Jaguar Health, Inc. and its directors and officers (incorporated by reference to Exhibit 10.1 to the Registration Statement on Form S_1 (No. 333_198383) filed with the Securities and Exchange Commission on August 27, 2014).
10.2‡	Jaguar Health, Inc. 2014 Stock Incentive Plan (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K filed with the Securities and Exchange Commission on June 20, 2016).
10.3‡	Form of Notice of Grant of Stock Option and Stock Option Agreement under the 2014 Stock Incentive Plan (incorporated by reference to Exhibit 10.6 to the Registration Statement on Form S_1 (No. 333_198383) filed with the Securities and Exchange Commission on August 27, 2014).
10.4‡	Form of Notice of Grant of Restricted Stock and Restricted Stock Agreement under the 2014 Stock Incentive Plan (incorporated by reference to Exhibit 10.7 to the Registration Statement on Form S_1 (No. 333_198383) filed with the Securities and Exchange Commission on August 27, 2014).
10.5‡	Form of Notice of Grant of Restricted Stock Units and Restricted Stock Unit Agreement under the 2014 Stock Incentive Plan (incorporated by reference to Exhibit 10.8 to the Registration Statement on Form S_1 (No. 333_198383) filed with the Securities and Exchange Commission on August 27, 2014).
10.6‡	Offer Letter by and between Jaguar Health, Inc. and Lisa A. Conte, dated March 1, 2014 (incorporated by reference to Exhibit 10.9 to the Registration Statement on Form S_1 (No. 333_198383) filed with the Securities and Exchange Commission on August 27, 2014).
10.7‡	Offer Letter by and between Jaguar Health, Inc. and Steven R. King, Ph.D., dated February 28, 2014 (incorporated by reference to Exhibit 10.11 to the Registration Statement on Form S_1 (No. 333_198383) filed with the Securities and Exchange Commission on August 27, 2014).
10.8	Form of Common Stock Warrant that expires February 5, 2019 (incorporated by reference to Exhibit 10.16 to the Registration Statement on Form S_1 (No. 333_198383) filed with the Securities and Exchange Commission on August 27, 2014).
10.9	Form of Common Stock Warrant issued to Indena S.p.A. that expires June 26, 2019 (incorporated by reference to Exhibit 10.17 to the Registration Statement on Form S_1 (No. 333_198383) filed with the Securities and Exchange Commission on August 27, 2014).
10.11	Non_Disturbance Letter Agreement by and between Napo Pharmaceuticals, Inc. and Nantucket Investments Limited, as Administrative Agent and Collateral Agent, dated October 10, 2014 (incorporated by reference to Exhibit 10.23 to the Registration Statement on Form S_1/A (No. 333_198383) filed with the Securities and Exchange Commission on October 10, 2014).
10.12	Form of Warrant to Purchase Common Stock issued to GPB Life Science Holdings LLC and 31 Group, LLC, which expires October 30, 2019 (incorporated by reference to Exhibit 10.25 to the Registration Statement on Form S_1/A (No. 333_198383) filed with the Securities and Exchange Commission on October 31, 2014).
10.13	Form of Exchange Warrant to Purchase Common Stock, issued to GPB Life Science Holdings LLC and 31 Group, LLC, which expires June 3, 2020, as amended (incorporated by reference to Exhibit 10.27 to the Registration Statement on Form S_1/A (No. 333_198383) filed with the Securities and Exchange Commission on April 17, 2015).
10.14	Amendment No. 1 to Amended and Restated License Agreement between Jaguar Health, Inc. and Napo Pharmaceuticals, Inc., dated as of January 27, 2015 (incorporated by reference to Exhibit 10.28 to the Registration Statement on Form S_1/A (No. 333_198383) filed with the Securities and Exchange Commission on March 20, 2015).
10.16	

	Form of Representative's Warrant (incorporated by reference to Exhibit 10.33 to the Registration Statement on Form S_1/A (No. 333_198383) filed with the Securities and Exchange Commission on April 17, 2015).
10.17	Form of Warrant and Note Exercise Amendment pursuant to Convertible Note and Warrant Purchase Agreement dated December 23, 2014 (incorporated by reference to Exhibit 10.35 to the Registration Statement on Form S_1/A (No. 333_198383) filed with the Securities and Exchange Commission on April 17, 2015).

Table of Contents

Exhibit No.	Description
10.18	Convertible Note and Warrant Purchase Agreement dated March 20, 2015 by and between Jaguar Health, Inc., and Dechra Pharmaceuticals PLC (incorporated by reference to Exhibit 10.37 to the Registration Statement on Form S-1/A (No. 333-198383) filed with the Securities and Exchange Commission on April 17, 2015).
10.19	Common Stock Warrant issued pursuant to the Convertible Note and Warrant Purchase Agreement dated March 20, 2015, which expires December 31, 2017 (incorporated by reference to Exhibit 10.39 to the Registration Statement on Form S-1/A (No. 333-198383) filed with the Securities and Exchange Commission on April 17, 2015).
10.20	Form of Warrant Exercise Amendment pursuant to Exchange Warrant to Purchase Common Stock dated December 3, 2014 (incorporated by reference to Exhibit 10.40 to the Registration Statement on Form S-1/A (No. 333-198383) filed with the Securities and Exchange Commission on April 17, 2015).
10.21	Form of Amended and Restated Exchange Warrant to Purchase Common Stock (incorporated by reference to Exhibit 10.41 to the Registration Statement on Form S-1/A (No. 333-198383) filed with the Securities and Exchange Commission on April 17, 2015).
10.22	Sublease Agreement by and between SeeChange Health Management LLC and Jaguar Health, Inc., dated June 19, 2015 (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K (No. 001-36714) filed with the Securities and Exchange Commission on June 23, 2015).
10.23	Consent to Sublease by and among CA-Mission Street Limited Partnership, SeeChange Health Management LLC and Jaguar Health, Inc., dated June 19, 2015 (incorporated by reference to Exhibit 10.2 to the Current Report on Form 8-K (No. 001-36714) filed with the Securities and Exchange Commission on June 23, 2015).
10.25†	Manufacture and Supply Agreement between Jaguar Health, Inc. and Glenmark Pharmaceuticals Ltd., dated September 22, 2015 (incorporated herein by reference to Exhibit 10.2 to the Quarterly Report on Form 10-Q (No. 001-36714) filed with the Securities and Exchange Commission on November 13, 2015).
10.26	Formulation Development and Manufacturing Agreement between Jaguar Health, Inc. and Patheon Pharmaceuticals Inc., dated October 8, 2015 (incorporated by reference to Exhibit 10.30 to the Registration Statement on Form S-1 (No. 333-208905) filed with the Securities and Exchange Commission on January 7, 2016).
10.27‡	Offer Letter by and between Jaguar Health, Inc., and Karen Wright, dated as of October 11, 2015 (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K filed with the Securities and Exchange Commission on December 18, 2015).
10.28	Form of Convertible Promissory Note issued pursuant to the Convertible Note and Warrant Purchase Agreement dated as of December 23, 2014 (incorporated by reference to Exhibit 10.30 to the Registration Statement on Form S-1/A (No. 333-198383) filed with the Securities and Exchange Commission on March 20, 2015).
10.30	Common Stock Purchase Agreement, dated June 8, 2016, by and between Jaguar Health, Inc. and Aspire Capital Fund, LLC (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K filed on June 9, 2016).
10.31	Letter of Intent, between Jaguar Health, Inc. and Napo Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K filed on October 6, 2016).
10.32	Common Stock Warrant issued pursuant to the Letter Agreement, dated November 8, 2016, between Jaguar Health, Inc. and Serious Change II LP, which expires July 28, 2022 (incorporated herein by reference to Exhibit 10.2 to the Quarterly Report on Form 10-Q (No. 001-36714) filed on November 14, 2016).
10.33	Form of Securities Purchase Agreement, by and among Jaguar Health, Inc. and the investors in the 2016 Private Placement (incorporated herein by reference to Exhibit 10.1 to the Current Report on

	Form 8_K filed on November 29, 2016).
10.34	Form of Registration Rights Agreement, by and among Jaguar Health, Inc. and the investors in the 2016 Private Placement (incorporated herein by reference to Exhibit 10.2 to the Current Report on Form 8_K filed on November 29, 2016).
10.35	Supply and Distribution Agreement, dated as of September 6, 2016, by and between Jaguar Health, Inc. and Integrated Animal Nutrition and Health Inc. (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10_Q/A (No. 001_36714) filed on December 5, 2016).

Table of Contents

Exhibit No.	Description
10.36†	Distribution Agreement, dated December 9, 2016, by and between Jaguar Health, Inc. and Henry Schein, Inc (incorporated herein by reference to Exhibit 10.41 to the Annual Report on Form 10_K filed on February 15, 2017).
10.37†	License, Development, Co_Promotion and Commercialization Agreement, dated January 27, 2017, by and between Jaguar Health, Inc. and Elanco US, Inc (incorporated herein by reference to Exhibit 10.42 to the Annual Report on Form 10_K filed on February 15, 2017).
10.38	Common Stock Warrant issued pursuant to the Letter Agreement, dated January 30, 2017, between Jaguar Health, Inc. and Serious Change II LP, which expires January 31, 2019 (incorporated herein by reference to Exhibit 10.43 to the Annual Report on Form 10_K filed on February 15, 2017).
10.39	Binding Agreement of Terms for Jaguar Health, Inc. Acquisition of Napo Pharmaceuticals, dated February 8, 2017, between Jaguar Health, Inc. and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.1 to the Current Report on Form 8_K filed on February 9, 2017).
10.40	Employee Leasing and Overhead Allocation Agreement, dated July 1, 2016, by and between Napo Pharmaceuticals, Inc. and Jaguar Health, Inc. (incorporated herein by reference to Exhibit 10.1 to the Quarterly Report on Form 10_Q (No. 001_36714) filed on May 15, 2017).
10.41	Amendment No. 1 to Employee Leasing and Overhead Allocation Agreement, dated March 2, 2017, by and between Jaguar Health, Inc. and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.2 to the Quarterly Report on Form 10_Q (No. 001_36714) filed on May 15, 2017).
10.42	Binding Agreement of Terms for Jaguar Animal Health, Inc. Acquisition of Napo Pharmaceuticals, dated February 8, 2017, between Jaguar Health, Inc. and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.1 to the Current Report on Form 8_K filed on February 9, 2017).
10.43	Commitment Letter, dated February 21, 2017, signed by Invesco Asset Management Limited (incorporated herein by reference to Exhibit 10.4 to the Quarterly Report on Form 10_Q (No. 001_36714) filed on May 15, 2017).
10.44	Note Purchase Agreement, dated March 1, 2017, by and among Napo Pharmaceuticals, Inc. and the purchasers named therein (incorporated herein by reference to Exhibit 10.45 to the Registration Statement on Form S_4 filed April 18, 2017 (No. 333_217364)).
10.45	Investor Rights Agreement, dated March 31, 2017, by and between Jaguar Health, Inc. and Nantucket Investments Limited (incorporated by reference herein to Exhibit 10.1 to the Current Report on Form 8_K filed on March 31, 2017).
10.46	Form of Original Issue Discount Exchange Promissory Note issued pursuant to the Note Purchase Agreement dated as of March 1, 2017, by and among Napo Pharmaceuticals, Inc. and the Purchasers as defined therein (incorporated herein by reference to Exhibit 10.46 to the Registration Statement on Form S_4 filed April 18, 2017 (No. 333_217364)).
10.47	Amended and Restated Note Purchase Agreement, dated March 31, 2017, by and among Napo Pharmaceuticals, Inc., Kingdon Associates, M. Kingdon Offshore Master Fund L.P., and Kingdon Family Partnership, L.P. (incorporated herein by reference to Exhibit 10.47 to the Registration Statement on Form S_4 filed April 18, 2017 (No. 333_217364)).
10.48	Form of Kingdon Convertible Promissory Note issued pursuant to the Amended and Restated Note Purchase Agreement, dated March 31, 2017, by and among Napo Pharmaceuticals, Inc., Kingdon Associates, M. Kingdon Offshore Master Fund L.P., and Kingdon Family Partnership, L.P. (incorporated herein by reference to Exhibit 10.48 to the Registration Statement on Form S_4 filed April 18, 2017 (No. 333_217364)).
10.49	Limited Subordination Agreement, dated December 30, 2016, by and among Napo Pharmaceuticals, Inc., Kingdon Capital Management, L.L.C., Nantucket Investments Limited, the lenders under the Nantucket Financing Agreement party thereto, Dorsar Investment Company, Alco Investment Company and Two Daughters LLC (incorporated herein by reference to Exhibit 10.49 to

	the Registration Statement on Form S-4 filed April 18, 2017 (No. 333-217364)).
10.50	Security Agreement, dated December 30, 2016, by and among Napo Pharmaceuticals, Inc., Kingdon Capital Management, L.L.C., and the purchasers named therein (incorporated herein by reference to Exhibit 10.50 to the Registration Statement on Form S-4 filed April 18, 2017 (No. 333-217364)).
10.51	Settlement and Discounted Payoff Agreement, dated March 31, 2017, by and among the lenders named therein, Nantucket Investments Limited, and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.52 to the Registration Statement on Form S-4 filed April 18, 2017 (No. 333-217364)).

Table of Contents

Exhibit No.	Description
10.52	Debt and Warrant Settlement Agreement, dated March 31, 2017, by and among Dorsar Investment Company, Alco Investment Company, Two Daughters LLC, and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.53 to the Registration Statement on Form S-4 filed April 18, 2017 (No. 333-217364)).
10.53	Debt Settlement Agreement, dated March 31, 2017, by and between Boies Schiller Flexner LLP and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.54 to the Registration Statement on Form S-4 filed April 18, 2017 (No. 333-217364)).
10.54	Debt Settlement Agreement, dated March 31, 2017, by and between Dan Becka and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.55 to the Registration Statement on Form S-4 filed April 18, 2017 (No. 333-217364)).
10.55‡	Form of Escrow Agreement, by and among Jaguar Animal Health, Inc., Nantucket Investments Limited and Citibank, National Association (incorporated herein by reference to Exhibit 10.57 to the Registration Statement on Form S-4 filed April 18, 2017 (No. 333-217364)).
10.56‡	Form of Restricted Stock Unit Indemnification and Forfeiture Agreement, by and among Jaguar Animal Health, Inc., Napo Pharmaceuticals, Inc. and the holders of Napo RSUs (incorporated herein by reference to Exhibit 10.58 to the Registration Statement on Form S-4 filed April 18, 2017 (No. 333-217364)).
10.57†	Collaboration Agreement, dated July 2, 2005, by and between Glenmark Pharmaceuticals Ltd. and Napo Pharmaceuticals, Inc., as amended (incorporated herein by reference to Exhibit 10.59 to the Registration Statement on Form S-4/A filed May 26, 2017 (No. 333-217364)).
10.58	Settlement Agreement, dated December 29, 2013, by and between Glenmark Pharmaceuticals Ltd. and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.60 to the Registration Statement on Form S-4/A filed May 26, 2017 (No. 333-217364)).
10.59†	Alliance Agreement, dated May 23, 2005, by and among AsiaPharm Investment Limited and its Affiliates, including Shandong Luye Pharmaceuticals Co. Ltd., and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.61 to the Registration Statement on Form S-4/A filed May 26, 2017 (No. 333-217364)).
10.60†	Finder's Agreement, dated April 9, 2010, by and among Luye Pharma Group Limited and its Affiliates, including Shandong Luye Pharmaceuticals Co. Ltd., and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.62 to the Registration Statement on Form S-4/A filed May 26, 2017 (No. 333-217364)).
10.61†	Settlement, Termination, Asset Transfer and Transition Agreement, dated March 4, 2016, by and between Napo Pharmaceuticals, Inc. and Salix Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.63 to the Registration Statement on Form S-4/A filed June 28, 2017 (No. 333-217364)).
10.62	First Amendment to Settlement, Termination, Asset Transfer and Transition Agreement, dated as of May 10, 2016, by and between Napo Pharmaceuticals, Inc. and Salix Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.64 to the Registration Statement on Form S-4/A filed May 26, 2017 (No. 333-217364)).
10.63	Investment Rights Agreement, dated April 20, 2006, as amended January 25, 2011, by and among IL&FS Trust Company Limited, as trustee of the IL&FS Private Equity Trust, investing through its venture capital scheme Leverage India Fund, acting through its investment manager IL&FS Investment Managers Limited, and

	Napo Pharmaceuticals, Inc., and Napo India Private Limited and the Management Team, as defined therein (incorporated herein by reference to Exhibit 10.69 to the Registration Statement on Form S-4/A filed May 26, 2017 (No. 333-217364)).
10.64	Investment Rights Agreement, dated October 1, 2007, by and among IL&FS Trust Company Limited, as trustee of the IL&FS Private Equity Trust, investing through its venture capital scheme Leverage India Fund, acting through its investment manager IL&FS Investment Managers Limited, and Sindu Private Limited, and Napo Pharmaceuticals, Inc., and Indus Pharmaceuticals Inc. (incorporated herein by reference to Exhibit 10.70 to the Registration Statement on Form S-4/A filed May 26, 2017 (No. 333-217364)).
10.65	Investment Rights Agreement, dated December 21, 2009, by and among IL&FS Trust Company Limited, as trustee of the IL&FS Private Equity Trust, investing through its venture capital scheme Leverage India Fund, acting through its investment manager IL&FS Investment Managers Limited, and Napo Pharmaceuticals, Inc., and Napo Pharmaceuticals India Private Limited (incorporated herein by reference to Exhibit 10.71 to the Registration Statement on Form S-4/A filed May 26, 2017 (No. 333-217364)).

Table of Contents

Exhibit No.	Description
10.66†	Marketing and Distribution Agreement, dated as of April 14, 2016, by and among Napo Pharmaceuticals, Inc. and BexR Logistics, LLC, as amended (incorporated herein by reference to Exhibit 10.72 to the Registration Statement on Form S_4/A filed June 28, 2017 (No. 333_217364)).
10.67†	Strategic Marketing Alliance Agreement, dated as of April 14, 2016, by and between Napo Pharmaceuticals, Inc. and SmartPharma, LLC (incorporated herein by reference to Exhibit 10.73 to the Registration Statement on Form S_4/A filed June 28, 2017 (No. 333_217364)).
10.68	Quality Agreement, dated May 21, 2013, between Salix Pharmaceuticals, Inc. and Patheon Pharmaceuticals Inc., as assigned by Salix Pharmaceuticals Inc. to Napo Pharmaceuticals, Inc. pursuant to the Settlement, Termination, Asset Transfer and Transition Agreement, dated March 4, 2016, by and between Napo Pharmaceuticals, Inc. and Salix Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.74 to the Registration Statement on Form S_4/A filed May 26, 2017 (No. 333_217364)).
10.69†	Master Manufacturing Services Agreement, dated May 21, 2013, between Salix Pharmaceuticals, Inc. and Patheon Pharmaceuticals Inc., as assigned by Salix Pharmaceuticals Inc. to Napo Pharmaceuticals, Inc. pursuant to the Settlement, Termination, Asset Transfer and Transition Agreement, dated March 4, 2016, by and between Napo Pharmaceuticals, Inc. and Salix Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.75 to the Registration Statement on Form S_4/A filed June 28, 2017 (No. 333_217364)).
10.70†	Crofelemer Product Agreement, dated May 21, 2013, between Salix Pharmaceuticals, Inc. and Patheon Pharmaceuticals Inc., as assigned by Salix Pharmaceuticals Inc. to Napo pursuant to the Settlement, Termination, Asset Transfer and Transition Agreement, dated March 4, 2016, by and between Napo Pharmaceuticals, Inc. and Salix Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.76 to the Registration Statement on Form S_4/A filed May 26, 2017 (No. 333_217364)).
10.71†	License Agreement, dated February 28, 2007, by and between Insmed Incorporated and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.77 to the Registration Statement on Form S_4/A filed May 26, 2017 (No. 333_217364)).
10.72	Master Service Agreement, dated February 13, 2017, by and between Alamo Pharma Services, Inc. and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.80 to the Registration Statement on Form S_4/A filed May 26, 2017 (No. 333_217364)).
10.73†	Project Agreement, dated February 13, 2017, by and between Alamo Pharma Services, Inc., Mission Pharmacal Company, and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.81 to the Registration Statement on Form S_4/A filed May 26, 2017 (No. 333_217364)).
10.74†	Project Agreement, dated February 27, 2017, by and between Alamo Pharma Services, Inc. and Napo Pharmaceuticals, Inc. (incorporated herein by reference to Exhibit 10.82 to the Registration Statement on Form S_4/A filed May 26, 2017 (No. 333_217364)).
10.75	Amendment, Waiver & Consent, dated June 27, 2017, by and among Jaguar Health, Inc., Nantucket Investments Limited, and Napo Pharmaceuticals, Inc. (incorporated by reference to Ex. 10.83 of the Company's Registration Statement on Form S_4 (Registration No. 333_217364) filed on July 5, 2017).
10.76	Securities Purchase Agreement, dated June 29, 2017, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.1 to the Current Report on Form 8_K filed on July 3, 2017).
10.77	Subordination Agreement and Right to Purchase Debt, dated June 29, 2017, by and between Chicago Venture Partners, L.P., Jaguar Health, Inc. and Hercules Capital, Inc. (incorporated by reference to Ex. 10.2 to the Current Report on Form 8_K filed on July 3, 2017).
10.78	Security Agreement, dated June 29, 2017, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.3 to the Current Report on Form 8_K filed on

	July 3, 2017).
10.79	Form of Warrant Exercise Agreement (incorporated by reference to Ex. 10.1 to the Current Report on Form 8_K filed on July 31, 2017).
10.80	Share Purchase Agreement, dated July 31, 2017, by and between Jaguar Health, Inc. and Invesco Asset Management Limited (incorporated herein by reference to Exhibit 10.2 to the Quarterly Report on Form 10_Q (No. 001_36714) filed on November 20, 2017).
10.81	Letter Agreement, dated September 1, 2017, by and among Napo Pharmaceuticals, Inc., MEF I, L.P. and Riverside Merchant Partners (incorporated by reference to Exhibit 10.33 to the Form 8_K/A of Jaguar Health, Inc. filed September 14, 2017, File No. 001_36714).

Table of Contents

Exhibit No.	Description
10.82	Letter Agreement, dated August 31, 2017, by and among Napo Pharmaceuticals, Inc., M. Kingdon Offshore Master Fund L.P., Kingdon Family Partnership, L.P. and Kingdon Credit Master Fund L.P. (incorporated by reference to Exhibit 10.34 to the Form 8_K/A of Jaguar Health, Inc. filed September 14, 2017, File No. 001_36714).
10.83	Letter Agreement, dated August 28, 2017, by and among Napo Pharmaceuticals, Inc., Dorsar Investment Company, Alco Investment Company and Two Daughters LLC (incorporated by reference to Exhibit 10.35 to the Form 8_K/A of Jaguar Health, Inc. filed September 14, 2017, File No. 001_36714).
10.84	Letter Agreement, dated September 1, 2017, by and between Napo Pharmaceuticals, Inc. and Boies Schiller Flexner LLP (incorporated by reference to Exhibit 10.36 to the Form 8_K/A of Jaguar Health, Inc. filed September 14, 2017, File No. 001_36714).
10.85	Letter Agreement, dated August 30, 2017, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Exhibit 10.37 to the Form 8_K/A of Jaguar Health, Inc. filed September 14, 2017, File No. 001_36714).
10.86	Termination, Asset Transfer and Transition Agreement, dated September 22, 2017, by and between Napo Pharmaceuticals, Inc. and Glenmark Pharmaceuticals, Ltd. (incorporated herein by reference to Exhibit 10.8 to the Quarterly Report on Form 10_Q (No. 001_36714) filed on November 20, 2017).
10.87	Share Purchase Agreement, dated November 24, 2017, by and between Jaguar Health, Inc. and L2 Capital, LLC (incorporated by reference to Exhibit 10.1 to the Form 8_K of Jaguar Health, Inc. filed November 24, 2017, File No. 001_36714).
10.88	Common Stock Purchase Agreement, dated November 24, 2017, by and between Jaguar Health, Inc. and L2 Capital, LLC (incorporated by reference to Exhibit 10.1 to the Form 8_K of Jaguar Health, Inc. filed November 24, 2017, File No. 001_36714).
10.89	Collaboration Agreement, dated December 13, 2017, by and between Jaguar Health, Inc. and Seed Mena Businessmen Services, LLC. (incorporated by reference to Ex. 10.89 to the Annual Report on Form 10_K filed on April 9, 2018)
10.90	Securities Purchase Agreement, dated December 8, 2017, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.1 to the Current Report on Form 8_K filed on December 14, 2017).
10.91	Security Agreement, dated December 8, 2017, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.2 to the Current Report on Form 8_K filed on December 14, 2017).
10.92	Form of First Amended Original Issue Discount Exchangeable Promissory Note. (incorporated by reference to Ex. 4.1 to the Current Report on Form 8_K filed on January 2, 2018).
10.93	First Amendment to the Note Purchase Agreement and Notes, dated December 29, 2017, by and among Jaguar Health, Inc. and the purchasers named therein (incorporated by reference to Ex. 10.1 to the Current Report on Form 8_K filed on January 2, 2018).
10.94	Second Amendment to the Note Purchase Agreement and Notes and Payoff Agreement, dated February 16, 2018, by and among Jaguar Health, Inc. and the purchasers named therein (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K filed on February 16, 2018).
10.95	Consent and Payoff Agreement, dated February 27, 2018, by and between Napo Pharmaceuticals, Inc. and the purchasers named therein (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K filed on February 28, 2018).
10.96	Securities Purchase Agreement, dated February 26, 2018, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.1 to the Current Report on Form 8_K filed on March 2, 2018).
10.97	

	Security Agreement, dated February 26, 2018, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.2 to the Current Report on Form 8-K filed on March 2, 2018).
10.98	Series A Preferred Stock Purchase Agreement, dated March 23, 2018, by and between Jaguar Health, Inc. and Sagard Capital Partners, L.P. (incorporated by reference to Ex. 10.1 to the Current Report on Form 8-K filed on March 27, 2018).
10.99	Registration Rights Agreement, dated March 23, 2018, by and between Jaguar Health, Inc. and Sagard Capital Partners, L.P. (incorporated by reference to Ex. 10.2 to the Current Report on Form 8-K filed on March 27, 2018).

Table of Contents

Exhibit No.	Description
10.100	Form of Common Stock Purchase Agreement, dated March 23, 2018, by and between Jaguar Health, Inc. and the purchasers named therein (incorporated by reference to Ex. 10.3 to the Current Report on Form 8_K filed on March 27, 2018).
10.101	Management Services Agreement, dated March 23, 2018, by and between Jaguar Health, Inc. and Sagard Capital Partners Management Corp. (incorporated by reference to Ex. 10.3 to the Current Report on Form 8_K filed on March 27, 2018).
10.102	Securities Purchase Agreement, dated Marchh 21, 2018, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.4 to the Current Report on Form 8_K filed on March 27, 2018).
10.103	Security Agreement, dated March 21, 2018, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.5 to the Current Report on Form 8_K filed on March 27, 2018).
10.104‡	Offer Letter by and between Jaguar Health, Inc. and Robert J. Griffing, dated May 25, 2018 (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K/A filed on June 11, 2018).
10.105	Co-Promotion Agreement, dated June 28, 2018, by and between Napo Pharmaceuticals, Inc. and RedHill Biopharma, Inc. (incorporated by reference to Exhibit 10.2 to the Quarterly Report on Form 10-Q filed on August 13, 2018).
10.106	Amended and Restated Security Agreement, dated July 31, 2017, by and among Napo Pharmaceuticals, Inc., Kingdon Capital Management, L.L.C., and the purchasers named therein (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K/A filed on August 29, 2018).
10.107	Office Lease Agreement, dated August 30, 2018, between Jaguar Health, Inc. and CA-Mission Street Limited Partnership (incorporated by reference to Ex. 10.1 to the Current Report on Form 8_K filed on September 4, 2018).
10.108	Landlord Letter of Credit & Warrant Issuance Agreement, dated August 28, 2018, by and between Jaguar Health, Inc. and the letter of credit facilitator named therein (incorporated by reference to Ex. 10.2 to the Current Report on Form 8_K filed on September 4, 2018).
10.109	Note Purchase Agreement, dated September 11, 2018, by and between Jaguar Health, Inc. and L2 Capital, LLC (incorporated by reference to Ex. 10.1 to the Current Report on Form 8_K filed on September 12, 2018).
10.110	Note Purchase Agreement, dated September 11, 2018, by and between Jaguar Health, Inc. and Charles Conte (incorporated by reference to Ex. 10.2 to the Current Report on Form 8_K filed on September 12, 2018).
10.111	Registration Rights Agreement, dated September 11, 2018, by and between Jaguar Health, Inc. and L2 Capital, LLC (incorporated by reference to Ex. 10.3 to the Current Report on Form 8_K filed on September 12, 2018).
10.112	Registration Rights Agreement, dated September 11, 2018, by and between Jaguar Health, Inc. and Charles Conte (incorporated by reference to Ex. 10.4 to the Current Report on Form 8_K filed on September 12, 2018).
10.113	Standstill Agreement, dated October 1, 2018, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.1 to the Current Report on Form 8_K filed on October 5, 2018).
10.114	Suspension, Settlement and Termination Agreement, dated December 4, 2018, by and among Napo Pharmaceuticals, Inc., Jaguar Health, Inc. and SmartPharma, LLC (incorporated by reference to Ex. 10.1 to the Current Report on Form 8_K filed on December 10, 2018).
23.1*	Consent of Independent Registered Public Accounting Firm.

31.1*	Principal Executive Officer's Certifications Pursuant to Section 302 of the Sarbanes Oxley Act of 2002.
31.2*	Principal Financial Officer's Certifications Pursuant to Section 302 of the Sarbanes Oxley Act of 2002.
32.1**	Certification Pursuant to 18 U.S.C. § 1350 (Section 906 of Sarbanes Oxley Act of 2002).
32.2**	Certification Pursuant to 18 U.S.C. § 1350 (Section 906 of Sarbanes Oxley Act of 2002).
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase

Table of Contents

* Filed herewith.

** In accordance with Item 601(b)(32)(ii) of Regulation S K and SEC Release No. 34 47986, the certifications furnished in Exhibits 32.1 and 32.2 hereto are deemed to accompany this Form 10 K and will not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934 (the "Exchange Act") or deemed to be incorporated by reference into any filing under the Exchange Act or the Securities Act of 1933 except to the extent that the registrant specifically incorporates it by reference.

† Confidential treatment granted as to portions of the exhibit. Confidential materials omitted and filed separately with the Securities and Exchange Commission.

‡ Management contract or compensatory plan or arrangement.

Table of Contents

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

JAGUAR HEALTH, INC.

By: /s/ LISA A. CONTE
Lisa A. Conte
Chief Executive Officer and President

Date: April 10, 2019